
UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT PURSUANT TO SECTION 13 OR 15(d) OF
THE SECURITIES EXCHANGE ACT OF 1934

August 3, 2023

Date of Report (Date of earliest event reported)

QUAKER CHEMICAL CORPORATION

(Exact name of registrant as specified in its charter)
Commission File Number 001-12019

Pennsylvania
(State or other jurisdiction of
incorporation)

23-0993790
(I.R.S. Employer
Identification No.)

901 E. Hector Street
Conshohocken, Pennsylvania 19428
(Address of principal executive offices)

(Zip Code)

(610) 832-4000

(Registrant's telephone number, including area code)

Not Applicable

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, \$1 par value	KWR	New York Stock Exchange

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Item 8.01. Other Events.

As used in this Current Report on Form 8-K (the "Form 8-K"), the terms "Quaker Houghton," the "Company," "we," and/or "our" refer to Quaker Chemical Corporation (doing business as Quaker Houghton), its subsidiaries, and associated companies, unless the context otherwise requires.

As previously disclosed, during the first quarter of 2023, the Company reorganized its executive management team to align with its new business structure. The Company's new structure includes three reportable segments: (i) Americas; (ii) Europe, Middle East, and Africa ("EMEA"); and (iii) Asia/Pacific. Prior to the Company's reorganization, the Company's historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses.

This Form 8-K updates the information in the following sections of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2022 (the "2022 Form 10-K"), as filed with the Securities and Exchange Commission (the "SEC") on February 23, 2023, solely to reflect the retrospective application of the change in reportable segments:

- Part I. Item 1, Business.
- Part I. Item 2, Properties.
- Part II. Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations.
- Part II. Item 8, Financial Statements and Supplementary Data.

No items in the 2022 Form 10-K other than those identified above are being updated by this Form 8-K. This Form 8-K will permit the Company to incorporate the recast financial statements by reference, or otherwise, in future SEC filings. The information in this Form 8-K is not an amendment to the 2022 Form 10-K or a restatement of the financial statements included therein.

In our Quarterly Reports on Form 10-Q for the periods ended March 31, 2023 and June 30, 2023 (the "2023 10-Qs"), the Company adjusted the unaudited condensed consolidated financial statements for the three months ended March 31, 2022 and for the three and six months ended June 30, 2022, respectively, to reflect the retrospective application of our segment change.

This Form 8-K should be read in conjunction with the 2022 Form 10-K, the 2023 Form 10-Qs, and any other documents filed with the SEC subsequent to February 23, 2023. This Form 8-K does not reflect any subsequent information or events other than the change in segment reporting noted above. Without limiting the foregoing, this Form 8-K does not purport to update Management's Discussion and Analysis of Financial Condition and Results of Operations contained in the 2022 Form 10-K for any information, uncertainties, transactions, risks, events, or trends occurring, or known to management, other than the events described above.

Item 9.01. Financial Statements and Exhibits.

The following exhibits are included as part of this report:

<u>Exhibit No.</u>	<u>Description</u>
23.1	Consent of Independent Registered Public Accounting Firm, PricewaterhouseCoopers LLP
99.1	Updated portions of Quaker Chemical Corporation's 2022 Form 10-K
104	Cover Page Interactive Data File (embedded within the Inline XBRL document).

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

QUAKER CHEMICAL CORPORATION

Date: August 3, 2023

By: /s/ SHANE W. HOSTETTER
Shane W. Hostetter
Senior Vice President, Chief Financial Officer

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statement on Form S-8 (No. 333-272158) of Quaker Chemical Corporation of our report dated February 23, 2023, except with respect to our opinion on the consolidated financial statements insofar as it relates to the change in reportable segments discussed in Note 1, as to which the date is August 3, 2023, relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Current Report on Form 8-K.

/s/ PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
August 3, 2023

EXPLANATORY NOTE

As previously disclosed, during the first quarter of 2023, the Company reorganized its executive management team to align with its new business structure. The Company's new structure includes three reportable segments: (i) Americas; (ii) Europe, Middle East and Africa ("EMEA"); and (iii) Asia/Pacific. Prior to the Company's reorganization, the Company's historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses.

This Current Report on Form 8-K (the "Report") updates the information in the following sections of the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2022 (the "2022 Form 10-K"), as filed with the Securities and Exchange Commission (the "SEC") on February 23, 2023 to reflect retrospective application of the change in reportable segments to conform to the new segment presentation:

- Part I. Item 1, Business.
- Part I. Item 2, Properties.
- Part II. Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations.
- Part II. Item 8, Financial Statements and Supplementary Data.

This Report does not reflect any subsequent information or events other than the change in segment reporting noted above. Without limiting the foregoing, this Form 8-K does not purport to update Management's Discussion and Analysis of Financial Condition and Results of Operations contained in the 2022 Form 10-K for any information, uncertainties, transactions, risks, events, or trends occurring, or known to management, other than the events described above. More current information is contained in our Quarterly Reports on Form 10-Q for the periods ended March 31, 2023 and June 30, 2023 (the "2023 Form 10-Qs") and other filings with the SEC. This Form 8-K should be read in conjunction with the 2022 Form 10-K, the 2023 Form 10-Qs, and any other documents filed with the SEC subsequent to February 23, 2023.

QUAKER CHEMICAL CORPORATION

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PART I

As used in this Annual Report on Form 10-K (the “Report”), the terms “Quaker Houghton,” the “Company,” “we,” and “our” refer to Quaker Chemical Corporation (doing business as Quaker Houghton), its subsidiaries, and associated companies, unless the context otherwise requires. The “Combination” refers to the Quaker combination with Houghton International, Inc. (“Houghton”).

Item 1. Business.

General Description

The Company was organized in 1918 and incorporated as a Pennsylvania business corporation in 1930. Quaker Houghton is the global leader in industrial process fluids. With a presence around the world, including operations in over 25 countries, the Company’s customers include thousands of the world’s most advanced and specialized steel, aluminum, automotive, aerospace, offshore, container, mining, and metalworking companies. Quaker Houghton develops, produces, and markets a broad range of formulated chemical specialty products and offers chemical management services (which we refer to as “Fluidcare™”) for various heavy industrial and manufacturing applications throughout its three segments: Americas; Europe, Middle East and Africa (“EMEA”); and Asia/Pacific. Prior to the Company’s reorganization during the first quarter of 2023, the Company’s historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses.

The major product lines of Quaker Houghton include metal removal fluids, cleaning fluids, corrosion inhibitors, metal drawing and forming fluids, die cast mold releases, heat treatment and quenchants, metal forging fluids, hydraulic fluids, specialty greases, offshore sub-sea energy control fluids, rolling lubricants, rod and wire drawing fluids and surface treatment chemicals. The following are the respective contributions to consolidated net sales of each of our principal product lines representing more than 10% of consolidated net sales for any of the past three years based on the Company’s current product line segmentation:

	2022	2021	2020
Metal removal fluids	22.9 %	23.4 %	23.9 %
Rolling lubricants	20.8 %	22.2 %	21.8 %
Hydraulic fluids	14.1 %	13.6 %	13.3 %

Sales Revenue

A substantial portion of the Company’s sales worldwide are made directly through its own employees and its Fluidcare™ programs, with the balance sold through distributors and agents. The Company’s employees typically visit the plants of customers regularly, work on site, and through training and experience, identify production needs which can be resolved or otherwise addressed either by utilizing the Company’s existing products or by applying new formulations developed in its laboratories.

As part of the Company’s Fluidcare™ business, certain third-party product sales to customers are managed by the Company. Where the Company acts as principal, revenues are recognized on a gross reporting basis at the selling price negotiated with its customers. Where the Company acts as an agent for its customers, revenue is recognized on a net reporting basis at the amount of the administrative fee earned by the Company for ordering the goods. See Note 5 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Competition

The specialty chemical industry comprises a number of companies similar in size to the Company, as well as companies larger and smaller than Quaker Houghton. The Company cannot readily determine its precise competitive position in every industry it serves. However, the Company estimates it holds a leading global position in the market for industrial process fluids including significant global positions in the markets for process fluids in portions of the automotive and industrial markets, and a leading position in the market for process fluids to produce sheet steel and aluminum. The offerings of many of the Company’s competitors differ from those of Quaker Houghton; some offer a broad portfolio of fluids, including general lubricants, while others have more specialized product ranges. All competitors provide different levels of technical services to individual customers. Competition in the industry is based primarily on the ability to supply products that meet the needs of the customer and provide technical services and laboratory assistance to the customer, and to a lesser extent, on price.

Major Customers and Markets

In 2022, Quaker Houghton’s five largest customers (each composed of multiple subsidiaries or divisions with semi-autonomous purchasing authority) accounted for approximately 11% of consolidated net sales, with its largest customer accounting for approximately 3% of consolidated net sales. A significant portion of the Company’s revenues are realized from the sale of process fluids and services to manufacturers of steel, aluminum, automobiles, aircraft, industrial equipment, and durable goods and, therefore, Quaker Houghton is subject to the same business cycles as those experienced by these manufacturers and their customers.

The Company's financial performance is generally correlated to the volume of global production within the industries it serves, rather than directly related to the financial performance of its customers. Furthermore, steel and aluminum customers typically have limited manufacturing locations compared to metalworking customers and generally use higher volumes of products at a single location.

Raw Materials

Quaker Houghton uses approximately 3,000 raw materials, including animal fats, vegetable oils, mineral oils, oleochemicals, ethylene, solvents, surfactant agents, various chemical compounds that act as additives to our base formulations, and a wide variety of other organic and inorganic compounds and various derivatives of the foregoing. The price of mineral oil and its derivatives can be affected by the price of crude oil and industry refining capacity. Animal fat and vegetable oil prices, as well as the prices of other raw materials, are impacted by their own unique supply and demand factors, and by biodiesel consumption which is affected by the price of crude oil. Accordingly, significant fluctuations in the price of crude oil can have a material impact on the cost of these raw materials. In addition, many of the raw materials used by Quaker Houghton are commodity chemicals which can experience significant price volatility. As experienced during 2022, the Company's earnings have been and could continue to be affected by market changes in raw material prices. Reference is made to the disclosure contained in Item 7A of this Report.

Patents and Trademarks

Quaker Houghton has a limited number of patents and patent applications including patents issued, applied for, or acquired in the U.S. and in various foreign countries, some of which may be material to its business, with the earliest patent expiry in 2024. The Company principally relies on its proprietary formulae and its applications know-how and experience to meet customer needs. Quaker Houghton products are identified by numerous trademarks that are registered throughout its marketing area.

Research and Development—Laboratories

The Company maintains approximately thirty separate laboratory facilities worldwide that are primarily devoted to applied research and development. In addition, the Company maintains quality control labs at each of its manufacturing facilities. Quaker Houghton research and development is directed primarily toward applied technology since the nature of the Company's business requires continual modification and improvement of formulations to provide specialty chemicals to satisfy customer requirements. If problems are encountered which cannot be resolved by local laboratories, the problem is referred to one of our ten principal laboratories, located in Conshohocken, Pennsylvania; Valley Forge, Pennsylvania; Aurora, Illinois; Santa Fe Springs, California; Uithoorn, the Netherlands; Coventry, United Kingdom; Dortmund, Germany; Barcelona, Spain; Turin, Italy or Qingpu, China.

Research and development costs are expensed as incurred. Research and development expenses during the years ended December 31, 2022, 2021 and 2020 were \$46.0 million, \$44.9 million and \$40.0 million, respectively.

Recent Acquisition Activity

The Company has completed several recent acquisitions that expand its strategic product offerings and increase the Company's presence in its core industries. The Company's 2022 acquisitions consist of:

- In October 2022, the Company acquired a business that provides pickling and rinsing products and services, which is part of the EMEA reportable segment, for approximately \$3.5 million. This acquisition, along with the Company's January 2022 acquisition in the Americas reportable segment (described below), which had similar specializations and product offerings in pickling inhibitor technologies, strengthens Quaker Houghton's position in pickling inhibitors and additives, enabling the Company to better support and optimize production processes for customers across the Metals industry.
- In January 2022, the Company acquired a business that provides pickling inhibitor technologies, drawing lubricants and stamping oil, and various other lubrication, rust preventative, and cleaner applications, which is part of the Americas reportable segment for approximately \$8.0 million. This business broadens the Company's product offerings within its existing metals and metalworking business in the Americas reportable segment.
- In January 2022, the Company acquired a business related to the sealing and impregnation of metal castings for the automotive sector, as well as impregnation resin and impregnation systems for metal parts, which is part of the EMEA reportable segment for approximately \$1.4 million. This business broadens the Company's product offerings and service capabilities within its existing impregnation business.

Impact of COVID-19

During 2022, COVID-19 continued to negatively impact the Company's business operations, as well as those of its customers and suppliers, including increased costs and decreased availability of labor and raw materials. The Company's top priority, especially during this pandemic, has been to protect the health and safety of its employees and customers, while working to ensure business continuity to meet its customers' needs. In response, the Company implemented additional operational, health, and safety protocols, including enabling remote work where needed and practicable, employing social distancing standards, implementing travel restrictions where necessary, enhancing onsite hygiene practices, and instituting visitation restrictions at the Company's facilities, where necessary these operational changes remain in place. Although restrictions imposed by governments around the world have largely been eliminated or loosened, management continues to monitor and respond to the impacts related to COVID-19 on the Company, the overall specialty chemical industry, and the economies and markets in which the Company operates.

Management continues to evaluate how COVID-19-related circumstances, such as remote work arrangements, illness or staffing shortages and travel restrictions, may impact financial reporting processes and systems, internal control over financial reporting, and disclosure controls and procedures. At this time, management does not believe that COVID-19 has had a material impact on financial reporting processes, internal controls over financial reporting, or disclosure controls and procedures.

Regulatory Matters

In order to facilitate compliance with applicable federal, state, and local statutes and regulations relating to occupational health and safety and protection of the environment, the Company has an ongoing program of site assessment for the purpose of identifying capital expenditures or other actions that may be necessary to comply with such requirements. The program includes periodic inspections of each facility by the Company and/or independent experts, as well as ongoing inspections and training by on-site personnel. Such inspections address operational matters, record keeping, reporting requirements and capital improvements. Capital expenditures directed solely or primarily to regulatory compliance amounted to approximately \$2.2 million, \$4.2 million and \$3.7 million during the years ended December 31, 2022, 2021 and 2020, respectively.

Company Segmentation

The Company's operating segments, which are consistent with its reportable segments, reflect the structure of the Company's internal organization, the method by which the Company's resources are allocated and the manner by which the chief operating decision maker assesses the Company's performance. The reportable segments presented in this Annual Report reflect the retrospective application of business structure the Company operates under as of January 1, 2023, which consists of three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific. See Note 4 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Non-U.S. Activities

Since significant revenues and earnings are generated by non-U.S. operations, the Company's financial results are affected by currency fluctuations, particularly between the U.S. dollar and the euro, the British pound sterling, the Brazilian real, the Mexican peso, the Chinese renminbi and the Indian rupee, and the impact of those currency fluctuations on the underlying economies. Reference is made to (i) the foreign exchange risk information contained in Item 7A of this Report, (ii) the geographic information in Note 4 of Notes to Consolidated Financial Statements included in Item 8 of this Report, and (iii) information regarding risks attendant to foreign operations included in Item 1A of this Report.

Number of Employees

On December 31, 2022, Quaker Houghton had approximately 4,600 full-time employees globally of whom approximately 1,100 were employed by the parent company and its U.S. subsidiaries, and approximately 3,500 were employed by its non-U.S. subsidiaries. Associated companies of Quaker Houghton (in which it owns 50% or less and has significant influence) employed approximately 600 people on December 31, 2022.

Core Values

Quaker Houghton considers its employees as its greatest strength in differentiating our business and strengthening our market positions. We have established core values that are inclusive of embracing diversity and creating a culture where we learn from and are inspired by the many cultures, backgrounds and knowledge of our team members. The Company's goal is to have an organization that is inclusive of all its people and is representative of the communities in which we operate.

The Company's core values are (i) live safe; (ii) act with integrity; (iii) drive results; (iv) exceed customer expectations; (v) embrace diversity; and (vi) do great things together. Our core values embody who we are as a company, guide our decisions and inspire us. Our commitment to these values, in words and actions, builds a safer, stronger Quaker Houghton, and these values guide the Company's internal conduct and its relationship with the outside world. By fostering a culture and environment that exemplifies our core values, we gain, as a company, unique perspectives, backgrounds and varying experiences to ensure continued long-term success. The Company respects and values all of its employees and believes inclusion, diversity and equality are essential pillars to drive the Company's success.

Aligned to our core values, in 2022 we evolved our enterprise-wide approach to volunteerism. Moving forward, all employees will be provided with access to two paid days off per year that can be leveraged to volunteer for local charity organizations, or local chapters of national charity organizations, that seek to improve the conditions and lives of the people living in the communities in which our employees live and work.

Sustainability Governance and Strategy

In 2020, we established the Board Sustainability Committee, which has specific responsibility to assist the Board of Directors (the “Board”) in its assessment, evaluation, and oversight of the Company’s sustainability programs and initiatives pertaining to the Company’s business, operations, and employees. In formulating our Sustainability strategy, our Executive Leadership Team (“ELT”) and Board consider certain risks and uncertainties that may materially impact our financial condition and results of operations. These risks and uncertainties are further described in Item 1A of this Report.

In 2021, we set a target to achieve carbon neutrality in our global operations by 2030 and net zero emissions across our entire value chain by 2050. In addition, the Company established 15 long-term environmental and social goals, based on the results of the Company’s 2020 materiality assessment, which was completed with input from customers, investors, suppliers, and internal stakeholders. Our 15 long-term goals are closely aligned with the United Nations Sustainable Development Goals. We also identified short-term and medium-term milestones that may help support the achievement of our 2030 targets.

Sustainability Report

We report our progress on Environmental, Social, and Governance (“ESG”) milestones in our sustainability report, which is published annually and is available free of charge on our corporate website at home.quakerhoughton.com/sustainability. The Company’s 2021 Sustainability Report reflects the most recent available data on a variety of topics, including specific information relating to the Company’s: (i) environmental footprint and climate change commitments; (ii) diversity initiatives; (iii) safety initiatives and performance; and (iv) training courses which our employees have completed. Information in these sustainability reports and on our website are not incorporated by reference in this Report and, accordingly, should not be considered part of this Report.

Talent and Culture

We strive to make Quaker Houghton a great place to work for all employees. We are committed to creating a workplace where employees feel valued, respected and challenged, while fostering an environment that attracts and engages a talented workforce that contributes to the Company’s growth and sustained success. Our Compensation and Human Resources Committee is responsible for overseeing our policies and strategies related to culture and human capital, including diversity, equity and inclusion.

Our Quaker Houghton University is available to all employees and provides a library of tools and resources for career development and growth. Through ongoing dialogue with leaders, employees are encouraged to plan for their development and leverage the tools available to create meaningful and actionable development plans that drive personal and company growth.

We endeavor to ensure that our leaders of tomorrow are members of the Company today. Leadership capability is critical in supporting our culture of inclusion and collaboration. As such, leaders have access to various structured development and learning experiences. This includes our global management program (“MAP”) which provides guidance on applying sound and consistent management approaches to leading and developing teams. In addition, we provide custom development programs germane to the needs of our leaders today. Recent topics including Financial Acumen for Leaders, Building Resilient Teams and Leading Change.

We continue to invest in processes to help the organization assess and develop talent, including a formalized annual performance evaluation program, an annual critical skills and potential analysis, and succession planning for the organization’s most critical and senior roles.

Additionally, we regularly evaluate our Total Rewards offerings for our employees, including health and wellness benefits, paid-time off policies, monetary compensation, and educational reimbursements, to ensure that our total compensation and benefits packages are aligned with our business strategy, organizational culture, and diversity and inclusion approach while ensuring that we remain competitive in the markets we serve and follow local statutory wage and benefits laws. We pay particular attention to wellness and the well-being of our employees with specific investments on a variety of health related topics including forums for learning, dialogue, and enterprise collaboration. We strive to create a culture where recognition is ingrained within it, and do so by utilization of an enterprise reward and recognition program celebrating and incentivizing the results and behaviors of our employees and their impacts on our teams and company.

Diversity, Equity, and Inclusion (“DEI”)

As a global company, we want to build an organization that is inclusive of all people and representative of the communities in which we operate. Quaker Houghton provides equal employment opportunities and does not discriminate based on age, ethnicity, gender identity, disability / medical condition, race, religion, or sexual orientation. We believe that diversity and inclusion are embodied by having working norms and cultural familiarities whereby employees feel included, engaged, and rewarded, regardless of their background or where they sit in the organization. We seek to create an environment where every employee can feel their best allowing them to be their best.

Inclusion and diversity begin with the Board and ELT. The Board is comprised of twelve individuals with diverse experience and credentials, selected for their business acumen and ability to challenge and add value to management. Our current Board composition includes two female and four racially diverse directors out of a total of twelve directors. For additional information on the Company's leadership, refer to Item 4(a) Information about our Executive Officers and Item 10. Directors, Executive Officers and Corporate Governance.

In 2022, we focused on and dedicated investment in our talent acquisition, talent development, and succession planning efforts as a means to diversify our workforce. We have continually provided minority and female leaders the opportunity to attend targeted world-class external development programs that speak to the unique experiences these employees can face in the workplace while investing in their continued growth both personally and professionally. In addition, our core principles of a culture of inclusion are reflected in required employee training programs, which we offer on our policies against harassment and discrimination of any kind.

In 2022 we began a multi-year investment in the Future of STEM Scholars Initiative ("FOSSI"). This program seeks to create pathways for under-represented groups to enter and succeed in the chemical industry. As part of this program, Quaker Houghton has committed to providing meaningful paid summer internships that build knowledge in the student's chosen areas of study along with mentoring conversations with current Quaker Houghton leaders and opportunities for learning more about the industry and business.

We recognize that we are on a journey and, as such, we are working to formalize our DEI strategy as part of our broader investment in culture and engagement. Through partnerships with thought leaders in diversity, equity and inclusion, we intend to continue the journey we have started by expanding our employee resource groups, building processes to support the attraction and development of historically underrepresented talent early in their careers, hosting inclusion training events for all employees, providing forums for feedback and engagement on inclusion and continuing to build on our talent processes that enable change. For example, we published our workforce demographics in our Sustainability Report. By publicly disclosing our workforce demographics, we increase transparency in the composition of our workforce as well as facilitate accountability in achieving progress in our diversity goals, including ensuring that diverse candidates are actively considered for roles throughout the organization.

Workplace Safety

We are committed to maintaining a strong safety culture and to emphasizing the importance of our employees' role in identifying, mitigating and communicating safety risks. We maintain policies and operational practices that communicate a culture where all levels of employees are responsible for safety. We believe that the achievement of superior safety performance is both an important short-term and long-term strategic goal in managing our operations. We emphasize ten "lifesaving" rules which make a significant difference in preventing serious injuries and fatalities. We have launched several "Live Safe" initiatives to create an environment of openness and awareness in which all employees are actively engaged in meeting safety targets. We are keen in reporting near misses, hazard identifications and educating our employees on their "Stop Work Authority", which are seen as leading indicators, helping us to get to zero incidents. Our leading indicators are proactive and preventive measures that can shed light about the effectiveness of safety and health activities and reveal potential problems in a safety and health program. We also require all employees to regularly complete safety training. Additionally, our ELT is closely involved in our safety programs and conducts regular reviews of safety performance metrics and reviews the Company's safety performance during Company-wide meetings.

Quaker Houghton on the Internet

Financial results, news and other information about Quaker Houghton can be accessed from the Company's website at <https://www.quakerhoughton.com>. This site includes important information on the Company's locations, products and services, financial reports, news releases and career opportunities. The Company's periodic and current reports on Forms 10-K, 10-Q, 8-K, and other filings, including exhibits and supplemental schedules filed therewith, and amendments to those reports, filed with the Securities and Exchange Commission ("SEC") are available on the Company's website, free of charge, as soon as reasonably practicable after they are electronically filed with or furnished to the SEC. Information contained on, or that may be accessed through, the Company's website is not incorporated by reference in this Report and, accordingly, you should not consider that information part of this Report.

Factors that May Affect Our Future Results

(Cautionary Statements under the Private Securities Litigation Reform Act of 1995)

Certain information included in this Report and other materials filed or to be filed by us with the SEC, as well as information included in oral statements or other written statements made or to be made by us, contain or may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements can be identified by the fact that they do not relate strictly to historical or current facts. We have based these forward-looking statements, including statements regarding the potential effects of the COVID-19 pandemic, the Russia and Ukraine conflict, inflation and global supply chain constraints on the Company's business, results of operations, and financial condition, our expectation that we will maintain sufficient liquidity, remain in compliance with the terms of the Company's credit facility, expectations about future demand and raw material costs, and statements regarding the impact of increased raw material costs and pricing initiatives on our current expectations about future events.

These forward-looking statements include statements with respect to our beliefs, plans, objectives, goals, expectations, anticipations, intentions, financial condition, results of operations, future performance, and business, including:

- the impacts on our business as a result of the COVID-19 pandemic;
- the timing and extent of the projected impacts on our business as a result of the Ukrainian and Russian conflict and actions taken by various governments and governmental organizations in response;
- inflationary pressures, cost increases, and the impacts of constraints and disruptions in the global supply chain;
- the potential benefits of acquisitions;
- the potential for a variety of macroeconomic events, including the possibility of global or regional recessions, inflation generally, cost increases in prices of raw materials such as oil and increasing interest rates, to impact the value of our assets or result in asset impairments;
- our current and future results and plans including our sustainability goals; and
- statements that include the words “may,” “could,” “should,” “would,” “believe,” “expect,” “anticipate,” “estimate,” “intend,” “plan” or similar expressions.

Such statements include information relating to current and future business activities, operational matters, capital spending, and financing sources. From time to time, forward-looking statements are also included in the Company’s other periodic reports on Forms 10-K, 10-Q and 8-K, press releases, and other materials released to, or statements made to, the public.

Any or all of the forward-looking statements in this Report, in the Company’s Annual Report to Shareholders for 2022 and in any other public statements we make may turn out to be wrong. This can occur as a result of inaccurate assumptions or as a consequence of known or unknown risks and uncertainties. Many factors discussed in this Report will be important in determining our future performance. Consequently, actual results may differ materially from those that might be anticipated from our forward-looking statements.

We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise. However, any further disclosures made on related subjects in the Company’s subsequent reports on Forms 10-K, 10-Q, 8-K and other related filings should be consulted. A major risk is that demand for the Company’s products and services is largely derived from the demand for our customers’ products, which subjects the Company to uncertainties related to downturns in a customer’s business and unanticipated customer production slowdowns and shutdowns, including as is currently being experienced by many automotive industry companies as a result of supply chain disruptions.

Other major risks and uncertainties include, but are not limited to, the primary and secondary impacts of the COVID-19 pandemic, including actions taken in response to the pandemic by various governments, which could exacerbate some or all of the other risks and uncertainties faced by the Company, as well as inflationary pressures, including the potential for continued significant increases in raw material costs, supply chain disruptions, customer financial instability, rising interest rates and the possibility of economic recession, worldwide economic and political disruptions including the impacts of the military conflict between Russia and Ukraine, the economic and other sanctions imposed by other nations on Russia, suspensions of activities in Russia by many multinational companies and the potential expansion of military activity, foreign currency fluctuations, significant changes in applicable tax rates and regulations, future terrorist attacks and other acts of violence.

Furthermore, the Company is subject to the same business cycles as those experienced by our customers in the steel, automobile, aircraft, industrial equipment, and durable goods industries. Other factors could also adversely affect us, including those related to acquisitions and the integration of acquired businesses.

Our forward-looking statements are subject to risks, uncertainties and assumptions about the Company and its operations that are subject to change based on various important factors, some of which are beyond our control. These risks, uncertainties, and possible inaccurate assumptions relevant to our business could cause our actual results to differ materially from expected and historical results.

Therefore, we caution you not to place undue reliance on our forward-looking statements. For more information regarding these risks and uncertainties as well as certain additional risks that we face, refer to the Risk Factors section, which appears in Item 1A of this Report and in our quarterly and other reports filed from time to time with the SEC. This discussion is provided as permitted by the Private Securities Litigation Reform Act of 1995.

Item 2. Properties.

Quaker Houghton's corporate headquarters and a laboratory facility are located in its Americas segment's Conshohocken, Pennsylvania location. The Company's other principal facilities in its America's segment are located in Santa Fe Springs, California; Carrollton, Georgia; Aurora, Illinois; Waukegan, Illinois; Zion, Illinois; Detroit, Michigan; Madison Heights, Michigan; Batavia, New York; Cleveland, Ohio; Dayton, Ohio; Middletown, Ohio; Strongsville, Ohio; Lewisburg, Tennessee; Waterloo, Ontario; Monterrey, N.L., Mexico; Rio de Janeiro, Brazil and Sao Paulo, Brazil. The Company's EMEA segment has principal facilities in Uithoorn, Netherlands; Dortmund, Germany; Monheim am Rhein, Germany; Barbera, Spain; Bera, Spain; Santa Perpetua de Mogoda, Spain; Karlshamn, Sweden; Tradate, Italy; Turin, Italy Coventry, U.K; and Broms Grove, U.K. The Company's Asia/Pacific segment operates out of its principal facilities located in Chongqing, China; Qingpu, China; Shanghai, China; Songjiang, China; Dahej, India; Rayong, Thailand; Moorabbin, Australia; and Perth, Australia.

With the exception of the Conshohocken, Santa Fe Springs, Madison Heights, Lewisburg, Aurora, Karlshamn, Rayong, and Coventry sites, which are leased, the remaining principal facilities are owned by the Company and, as of December 31, 2022, were mortgage free. Quaker Houghton also leases sales, laboratory, manufacturing, and warehouse facilities in other locations.

Quaker Houghton's principal facilities consist of various manufacturing, administrative, warehouse, and laboratory buildings. Most of the buildings are of fire-resistant construction and are equipped with sprinkler systems. The Company has a program to identify needed capital improvements that are implemented as management considers necessary or desirable. Most locations have raw material storage tanks, ranging from 1 to 155 at each location with capacities ranging from 300 to 65,000 gallons, and processing or manufacturing vessels ranging from 1 to 54 at each location with capacities ranging from 2 to 45,000 gallons.

Each of Quaker Houghton's non-U.S. associated companies (in which it owns a 50% or less interest and has significant influence) owns or leases a plant and/or sales facilities in various locations, with the exception of Primex, Ltd.

PART II

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

As used in this Annual Report on Form 10-K (the "Report"), the terms "Quaker Houghton," the "Company," "we," and "our" refer to Quaker Chemical Corporation (doing business as Quaker Houghton), its subsidiaries, and associated companies, unless the context otherwise requires. The "Combination" refers to the Quaker combination with Houghton International, Inc. ("Houghton").

Executive Summary

Quaker Houghton is the global leader in industrial process fluids. With a presence around the world, including operations in over 25 countries, our customers include thousands of the world's most advanced and specialized steel, aluminum, automotive, aerospace, offshore, container, mining, and metalworking companies. Our high-performing, innovative and sustainable solutions are backed by best-in-class technology, deep process knowledge, and customized services. Quaker Houghton is headquartered in Conshohocken, Pennsylvania, located near Philadelphia in the U.S.

Overall, 2022 was a successful year as the Company navigated through a challenging financial, economic and geopolitical backdrop, which included the direct and indirect impacts of the ongoing war in Ukraine, Zero-COVID policies in China, significant raw material cost escalation, inflationary pressures on manufacturing and generally, all other global costs, supply chain and logistics challenges, and significant foreign currency volatility. Net sales of \$1,943.6 million in 2022 increased 10% compared to \$1,761.2 million in 2021, primarily due to increases from selling price and product mix of approximately 22% and additional net sales from acquisitions of 1%, partially offset by a 7% decline in organic sales volumes and an unfavorable impact from foreign currency translation of 6%. The increase in selling price and product mix was primarily the result of strategic price increases implemented to offset the ongoing inflationary pressures that began at the onset of 2021 and continued throughout 2022. The decline in organic sales volumes compared to 2021 was primarily a result of softer end market conditions, particularly in Europe and Asia/Pacific, the wind-down of the tolling agreement for products previously divested related to the Combination and the direct and indirect impacts of the ongoing war in Ukraine, partially offset by higher volumes due to net new business wins.

The Company had a net loss of \$15.9 million or \$0.89 per diluted share in 2022, compared to net income of \$121.4 million or \$6.77 per diluted share in 2021. The Company's reported net loss in 2022 primarily reflects a non-cash goodwill impairment charge of \$93.0 million in the fourth quarter related to the EMEA reportable segment. Excluding this and other non-recurring or non-core items in each period, the Company's current year non-GAAP net income and non-GAAP earnings per diluted share were \$105.3 million and \$5.87, respectively, compared to \$122.8 million and \$6.85, respectively, in 2021. The Company generated adjusted EBITDA of \$257.2 million compared to \$274.1 million in 2021. The lower year-over-year adjusted EBITDA was primarily a result of higher net sales which were offset by lower gross margins driven by higher raw material costs, higher manufacturing and other input costs, the impacts of disruptions in the global supply chain experienced in 2022, and higher selling, general and administrative expenses ("SG&A"), including the impact of higher sales on direct selling expenses, and additional SG&A from recent acquisitions. The lower year-over-year non-GAAP net income and non-GAAP earnings per diluted share were also impacted by higher interest expense and tax expense in 2022. See the Non-GAAP Measures section of this Item below.

The Company's 2022 operating performance in each of its three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific, reflect similar drivers to that of its consolidated performance as each of the Company's reportable segments net sales benefited from double-digit year-over-year increases in selling price and product mix, while those increases in net sales were partially offset by the significant and unfavorable impact of foreign currency translation in the EMEA and Asia/Pacific. All segments had lower organic sales volumes. Operating earnings for the Americas increased due to higher net sales and an improvement in margins. Operating earnings declined slightly in Asia/Pacific due to slightly lower margins and a strong comparison in the first half of 2021. EMEA operating earnings declined compared to the prior year due to the persistent and significant inflationary pressures on raw materials and other costs and the negative impact of foreign currency translation, partially offset by price realization. Additional details of each segment's operating performance are further discussed in the Company's reportable segments review, in the Operations section of this Item 7, below.

The Company generated net operating cash flow of \$41.8 million in 2022 compared to \$48.9 million in 2021. The decrease in net operating cash flow year-over-year was primarily driven by a lower operating performance in 2022 compared to 2021 coupled with significant working capital investments in each year. The key drivers of the Company's operating cash flow and overall liquidity are further discussed in the Company's Liquidity and Capital Resources section of this Item 7, below.

Overall, the Company delivered solid results in 2022, primarily due to strong price realization, as a result of the Company's ongoing value-based pricing initiatives, and positive net new business wins, in the face of extreme economic headwinds. Looking ahead to 2023, we believe the business is well positioned to continue to outpace market growth rates by delivering value-added solutions and services to its customers. The Company is committed to improving its margins as we progress through 2023, through both price and cost actions, while balancing customer relationships with the value we provide and the overall raw material environment and customer relationships. Additionally, the Company expects to continue to invest in its long-term growth including advancing its customer intimate strategy, progressing with its sustainability program and positioning the Company to deliver earnings growth in 2023 and beyond.

On-going impact of COVID-19

During 2022, the direct and indirect effects of COVID-19 continued to negatively impact the Company's business operations, as well as those of its customers and suppliers, including increased costs and decreased availability of labor and raw materials. The Company's top priority, especially during this pandemic, has been to protect the health and safety of its employees and customers, while working to ensure business continuity and meet its customers' needs. In response, the Company implemented additional operational, health, and safety protocols, including enabling remote work where needed and practicable, employing social distancing standards, implementing travel restrictions where necessary, enhancing onsite hygiene practices, and instituting visitation restrictions at the Company's facilities; where necessary, these operational changes remain in place. All of the Company's more than 30 production facilities worldwide are open and operating and are deemed as essential businesses in the jurisdictions where they are operating. Although restrictions imposed by governments around the world have largely been eliminated or loosened, management continues to monitor and respond to the impacts related to COVID-19 on the Company, the overall specialty chemical industry, and the economies and markets in which the Company and its customers and suppliers operate.

Management continues to evaluate how COVID-19-related circumstances, such as remote work arrangements, illness or staffing shortages and travel restrictions have affected financial reporting processes and systems, internal control over financial reporting, and disclosure controls and procedures. At this time, management does not believe that COVID-19 has had a material impact on financial reporting processes, internal controls over financial reporting, or disclosure controls and procedures.

Impact of Political Conflicts

A significant portion of the Company's revenues and earnings are generated by non-U.S. operations. This subjects the Company to political and economic risks that could adversely affect the Company's business, liquidity, financial position and results of operations. The existence of military conflicts, for example the ongoing war between Russia and Ukraine, bring inherent risks such as the potential for supply chain disruptions, increased costs of resources including oil, decreased trade activity and other consequences related to economic or other sanctions. The U.S. government and other nations have imposed significant restrictions on most companies' ability to do business in Russia as a result of the war between Russia and Ukraine. It is not possible to predict the broader or longer-term consequences of this conflict, which could include further sanctions, embargoes, regional instability, geopolitical shifts and adverse effects on macroeconomic conditions, security conditions, currency exchange rates and financial markets. The war between Russia and Ukraine has had a negative impact on the Company's ability to sell to, ship products to, collect payments from, and support customers in certain regions based on trade restrictions, embargoes and export control law restrictions, and logistics restrictions including closures of air space. If this conflict continues or expands, it could increase the costs, risks and adverse impacts from these new challenges. The Company and its customers and suppliers may also be the subject of increased cyber-attacks.

During the second quarter of 2022, the Company decided to cease its operations in Russia. The Company's operations in the conflict areas including Russia, Ukraine, and Belarus historically represented less than 2% of the Company's consolidated net sales and less than 1% of the Company's consolidated total assets. The Company's primary exposure in the conflict areas related to outstanding customer accounts receivable. The Company is actively monitoring its outstanding Russian receivables for collections and has recorded incremental allowances for credit losses where warranted.

Critical Accounting Policies and Estimates

Quaker Houghton's discussion and analysis of its financial condition and results of operations are based upon its consolidated financial statements which have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP"). The preparation of these financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, the Company evaluates its estimates, including those related to customer sales incentives, product returns, credit losses, inventories, property, plant and equipment ("PP&E"), investments, goodwill, intangible assets, income taxes, business combinations, restructuring, incentive compensation plans (including equity-based compensation), pensions and other postretirement benefits, contingencies and litigation. Quaker Houghton bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under such circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. However, actual results may differ from these estimates under different assumptions or conditions.

Quaker Houghton believes the following critical accounting policies describe the more significant judgments and estimates used in the preparation of its consolidated financial statements:

Accounts receivable and inventory exposures: The Company establishes allowances for credit losses for estimated losses resulting from the inability of its customers to make required payments. If the financial condition of the Company's customers were to deteriorate, resulting in an impairment of their ability to make payments, additional allowances may be required. As part of our terms of trade, we may custom manufacture products for certain large customers and/or may ship products on a consignment basis. Further, a significant portion of our revenue is derived from sales to customers in industries where companies have experienced past financial difficulties. If a significant customer bankruptcy occurs, then we must judge the amount of proceeds, if any, that may ultimately be received through the bankruptcy or liquidation process. These matters may increase the Company's exposure should a bankruptcy occur, and may require a write down or a disposal of certain inventory as well as the failure to collect receivables. Reserves for customers filing for bankruptcy protection are established based on a percentage of the amount of receivables outstanding at the bankruptcy filing date. However, initially establishing this reserve and the amount thereof is dependent on the Company's evaluation of likely proceeds to be received from the bankruptcy process, which could result in the Company recognizing minimal or no reserve at the date of bankruptcy. We generally reserve for large and/or financially distressed customers on a specific review basis, while a general reserve is maintained for other customers based on historical experience. The Company's consolidated allowance for credit losses was \$13.5 million and \$12.3 million as of December 31, 2022 and 2021, respectively. The Company recorded expense to increase its provision for credit losses by \$4.3 million, \$0.7 million and \$3.6 million for the years ended December 31, 2022, 2021 and 2020, respectively. Changing the amount of expense recorded to the Company's provisions by 10% would have increased or decreased the Company's pre-tax earnings by \$0.4 million, \$0.1 million and \$0.4 million for the years ended December 31, 2022, 2021 and 2020, respectively. See Note 13 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Tax exposures, uncertain tax positions and valuation allowances: The Company records expenses and liabilities for taxes based on estimates of amounts that will be determined as deductible or taxable in tax returns filed in various jurisdictions. The filed tax returns are subject to audit, which often occur several years subsequent to the date of the financial statements. Disputes or disagreements may arise during audits over the timing or validity of certain items, such as taxable income or deductions, which may not be resolved for extended periods of time. The Company also evaluates uncertain tax positions on all income tax positions taken on previously filed tax returns or expected to be taken on a future tax return in accordance with FIN 48, which prescribes the recognition threshold and measurement attributes for financial statement recognition and measurement of tax positions taken or expected to be taken on a tax return and, also, whether the benefits of tax positions are probable or if they will be more likely than not to be sustained upon audit based upon the technical merits of the tax position. For tax positions that are determined to be more likely than not to be sustained upon audit, the Company recognizes the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement in the financial statements. For tax positions that are not determined to be more likely than not sustained upon audit, the Company does not recognize any portion of the benefit in its financial statements. In addition, the Company's continuing practice is to recognize interest and/or penalties related to income tax matters in income tax expense. Also, the Company nets its liability for unrecognized tax benefits against deferred tax assets related to net operating losses or other tax credit carryforward on the basis that the uncertain tax position is settled for the presumed amount at the balance sheet date.

The Company also records valuation allowances when necessary to reduce its deferred tax assets to the amount that is more likely than not to be realized. While the Company has considered future taxable income and assesses the need for a valuation allowance, in the event Quaker Houghton were to determine that it would be able to realize its deferred tax assets in the future in excess of its net recorded amount, an adjustment to the deferred tax asset would increase income in the period such determination was made. Likewise, should the Company determine that it would not be able to realize all or part of its net deferred tax assets in the future, an adjustment to the deferred tax asset would be charged to income in the period such determination was made. Both determinations could have a material impact on the Company's financial statements.

Pursuant to the Tax Cuts and Jobs Act ("U.S. Tax Reform"), the Company recorded a \$15.5 million transition tax liability for U.S. income taxes on the undistributed earnings of non-U.S. subsidiaries. As of December 31, 2022, \$6.9 million in installments have been paid with the remaining \$8.6 million to be paid through installments in future years. However, the Company may also be subject to other taxes, such as withholding taxes and dividend distribution taxes, if certain undistributed earnings are ultimately remitted to the U.S. As of December 31, 2022, the Company has a deferred tax liability of \$6.8 million, which primarily represents the estimate of the non-U.S. taxes the Company will incur to remit certain previously taxed earnings to the U.S. It is the Company's current intention to reinvest its future undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives outside of the U.S. The amount of such undistributed earnings at December 31, 2022 was approximately \$424.7 million. Any tax liability which might result from ultimate remittance of these earnings is expected to be substantially offset by foreign tax credits (subject to certain limitations). It is currently impractical to estimate any such incremental tax expense. See Note 10 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Goodwill and other intangible assets: The Company accounts for business combinations under the acquisition method of accounting. This method requires the recording of acquired assets, including separately identifiable intangible assets, at their acquisition date fair values. Any excess of the purchase price over the estimated fair value of the identifiable net assets acquired is recorded as goodwill. The determination of the estimated fair value of assets acquired requires management's judgment and often involves the use of significant estimates and assumptions, including assumptions with respect to future cash inflows and outflows, the weighted average cost of capital ("WACC"), royalty rates, asset lives and market multiples, among other items. When necessary, the Company consults with external advisors to help determine fair value. For non-observable market values, the Company may determine fair value using acceptable valuation principles, including the excess earnings, relief from royalty, lost profit or cost methods.

The Company amortizes definite-lived intangible assets on a straight-line basis over their useful lives. Goodwill and intangible assets that have indefinite lives are not amortized and are required to be assessed at least annually for impairment. The Company completes its annual goodwill and indefinite-lived intangible asset impairment test during the fourth quarter of each year, or more frequently if triggering events indicate a possible impairment. The Company's consolidated goodwill at December 31, 2022 and 2021 was \$515.0 million and \$631.2 million, respectively. The Company has four indefinite-lived intangible assets totaling \$189.1 million as of December 31, 2022, including \$188.0 million of indefinite-lived intangible assets for trademarks and tradename associated with the Combination. Comparatively, the Company had four indefinite-lived intangible assets for trademarks and tradename totaling \$196.9 million as of December 31, 2021.

The Company completes its annual goodwill and indefinite-lived intangible asset impairment test during the fourth quarter of each year, or more frequently if triggering events indicate a possible impairment in one or more of its reporting units. The Company completed its annual impairment assessment as of October 1, 2022 and concluded no impairment charge was warranted. The Company continually evaluates financial performance, economic conditions and other recent developments in assessing if a triggering event indicates that the carrying values of goodwill, indefinite-lived, or long-lived assets are impaired.

During the fourth quarter of 2022, subsequent to the Company completing its annual impairment test as of October 1, 2022, the Company concluded that the continued negative impacts of the aforementioned events, most notably the continued rise in interest rates which led to an increase in the Company's cost of capital, as well as lower than expected financial performance driven by the ongoing lag in margin recovery represented an additional triggering event for the Company's EMEA reporting unit and the associated goodwill, as well as the related asset group. As a result of this conclusion, the Company completed an interim impairment assessment as of December 31, 2022 for its EMEA reporting unit and the related asset group. The Company concluded that the undiscounted cash flows exceeded the carrying value of the long-lived assets, and it was not more likely than not that an impairment exists. In completing a quantitative goodwill impairment test, the Company compares the reporting unit's fair value, primarily based on future discounted cash flows, to its carrying value in order to determine if an impairment charge is warranted. The estimates of future discounted cash flows involve considerable judgment and are based upon certain significant assumptions including the WACC as well as projected EBITDA, which includes assumptions related to revenue growth rates, gross margin levels and operating expenses. As a result of the impact of financial, economic, and geopolitical conditions driving a decrease in EMEA earnings in the current year, the impact of the current year decline on projected future earnings, as well as an increase in the WACC assumption utilized in this fourth quarter interim quantitative impairment assessment, the Company concluded that the estimated fair value of the EMEA reporting unit was less than its carrying value. As a result, a non-cash impairment charge of \$93.0 million to write down the carrying value of the EMEA reporting unit Goodwill to its estimated fair values was recorded in the fourth quarter of 2022. After this impairment charge, as of December 31, 2022, goodwill for the EMEA reporting unit was \$34.6 million.

In completing the interim quantitative impairment assessment, the Company used a WACC assumption of approximately 12.0% and holding all other assumptions constant, the WACC would have to increase by approximately 0.8 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired. In addition, holding EBITDA margins and all other assumptions constant, the Company's compound annual revenue growth rate during the entire projection period would need to decline by approximately 1.6 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired. Similarly, holding revenue growth rates and all other assumptions constant, the Company's average EBITDA margins throughout the discreet projection period would need to decline by approximately 2.3 percentage points before the Company's EMEA reporting unit's remaining goodwill would be fully impaired.

Notwithstanding the results of the Company's annual and trigger based interim impairment assessments during 2022 and the goodwill impairment charge taken in the fourth quarter of 2022, if the Company is unable to successfully implement actions aimed at more than offsetting raw material costs and ongoing inflationary pressures and the financial performance of the EMEA reporting unit declines further, or interest rates continue to rise and this leads to an increase in the cost of capital, then it is possible these financial, economic and geopolitical conditions could result in another triggering event for the EMEA reporting unit in the future and could potentially lead to an additional impairment of the EMEA reporting unit's remaining goodwill or other indefinite-lived or long-lived assets. See Note 16 of Notes to Consolidated Financial Statements in Item 8 of this Report.

In connection with the Company's reorganization and the associated change in reportable segments and reporting units during the first quarter of 2023, the Company performed the required impairment assessments directly before and immediately after the change in reporting units and concluded that it was not more likely than not that the fair values of any of the Company's previous or new reporting units were less than its carrying amount. These assessments were completed after the Company recorded a non-cash impairment charge of \$93.0 million during the fourth quarter of 2022 to write down the carrying value of the prior EMEA reporting unit's Goodwill to its estimated fair values.

Pension and Postretirement benefits: The Company provides certain defined benefit pension and other postretirement benefits to current employees, former employees and retirees. Independent actuaries, in accordance with U.S. GAAP, perform the required valuations to determine benefit expense and, if necessary, non-cash charges to equity for additional minimum pension liabilities. Critical assumptions used in the actuarial valuation include the weighted average discount rate, which is based on applicable yield curve data, including the use of a split discount rate (spot-rate approach) for the U.S. plans and certain foreign plans, rates of increase in compensation levels, and expected long-term rates of return on assets. If different assumptions were used, additional pension expense or charges to equity might be required.

Recently Issued Accounting Standards

See Note 3 of Notes to the Consolidated Financial Statements in Item 8 of this Report for a discussion regarding recently issued accounting standards.

Liquidity and Capital Resources

At December 31, 2022, the Company had cash, cash equivalents and restricted cash of \$181.0 million. Total cash, cash equivalents and restricted cash was \$165.2 million at December 31, 2021. The \$15.8 million increase in cash and cash equivalents was the net result of \$41.8 million of cash provided by operating activities and \$24.7 million of cash provided by financing activities partially offset by \$40.2 million of cash used in investing activities and approximately \$10.5 million of negative impacts due to the effect of foreign currency translation on cash.

Net cash flows provided by operating activities were \$41.8 million in 2022 compared to \$48.9 million in 2021. The Company's slightly lower current year net operating cash flow was primarily driven by lower earnings in 2022 as compared to 2021, partially offset by a lower working capital investment year-over-year. While the Company experienced ongoing working capital investment in 2022, the amount decelerated as compared to 2021. The year-over-year increase in net sales was larger in 2021 than in 2022, resulting in a smaller increase in accounts receivable in the current year. In addition, during 2022, the Company utilized certain non-income tax credits which were recognized during 2021, resulting in a decrease in working capital during the current year. Lastly, during 2021 there was a larger increase in inventory as a result of higher costs and, to a lesser extent, a build in certain inventory in response to global supply chain and logistics challenges, however, this larger prior year increase in inventory was partially offset by higher levels of accounts payable in the prior year as well, due to timing of purchases.

Net cash flows used in investing activities were \$40.2 million in 2022 compared to \$49.1 million in 2021. This \$8.9 million decrease in cash outflows used in investing activities was due to lower cash payments related to acquisitions as a result of the level of acquisition activity in each year, partially offset by lower cash proceeds from the disposition of assets which includes the sale of certain held-for-sale real property assets related to the Combination, and higher capital expenditures in the current year largely related to certain infrastructure and sustainability-related spending.

Net cash flows provided by financing activities were \$24.7 million in 2022 compared to net cash flows used in financing activities of \$13.5 million in 2021. The \$38.1 million increase in net cash inflows from financing activities was primarily driven by an increase in borrowings in the current year under the Company's primary credit facility (described below), including the impact of new borrowings, net of repayments of old borrowings and current year debt issuance costs, related to the June 2022 credit facility amendment. In addition, the Company paid \$30.1 million of cash dividends during 2022, a \$1.5 million or 5.3% increase in cash dividends compared to the prior year due to cash dividend per share increases.

The Company, its wholly owned subsidiary, Quaker Chemical B.V., as borrowers, Bank of America, N.A., as administrative agent, U.S. Dollar swing line lender and letter of credit issuer, and the other lenders party thereto, entered into a credit agreement on August 1, 2019, as amended (the "Original Credit Facility"). The Original Credit Facility was comprised of a \$400.0 million multicurrency revolver (the "Original Revolver"), a \$600.0 million term loan (the "Original U.S. Term Loan"), each with the Company as borrower, and a \$150.0 million (as of August 1, 2019) Euro equivalent term loan (the "Original EURO Term Loan"), with Quaker Chemical B.V., a Dutch subsidiary of the Company as borrower, each with a five-year term, maturing in August 2024.

During June 2022, the Company, and its wholly owned subsidiary, Quaker Houghton B.V., as borrowers, Bank of America, N.A., as administrative agent, U.S. Dollar swing line lender and letter of credit issuer, Bank of America Europe Designated Active Company, as Euro Swing Line Lender, certain guarantors and other lenders entered into an amendment to the Original Credit Facility (the “Amended Credit Facility”). The Amended Credit Facility established (A) a new \$150.0 million Euro equivalent senior secured term loan (the “Amended Euro Term Loan”), (B) a new \$600.0 million senior secured term loan (the “Amended U.S. Term Loan”), and (C) a new \$500.0 million senior secured revolving credit facility (the “Amended Revolver”). The Company has the right to increase the amount of the Amended Credit Facility by an aggregate amount not to exceed the greater of \$300.0 million or 100% of Consolidated EBITDA, subject to certain conditions. In addition, the Amended Credit Facility also:

- (i) eliminated the requirement that material foreign subsidiaries must guaranty the Original Euro Term Loan;
- (ii) replaced the U.S. Dollar borrowings reference rate from LIBOR to Term SOFR;
- (iii) extended the maturity date of the Original Credit Facility from August 2024 to June 2027; and
- (iv) effected certain other changes to the Original Credit Facility as set forth in the Amended Credit Facility.

The Company used the proceeds of the Amended Credit Facility to repay all outstanding loans under the Original Credit Facility, unpaid accrued interest and fees on the closing date under the Original Credit Facility and certain expenses and fees. U.S. Dollar-denominated borrowings under the Amended Credit Facility bear interest, at the Company’s election, at the base rate or term SOFR plus an applicable rate ranging from 1.00% to 1.75% for Term SOFR loans and from 0.00% to 0.75% for base rate loans, depending upon the Company’s consolidated net leverage ratio. Loans based on term SOFR also include a spread adjustment equal to 0.10% per annum. Borrowings under the Amended Credit Facility denominated in currencies other than U.S. Dollars bear interest at the alternative currency term rate plus the applicable rate ranging from 1.00% to 1.75%

The Amended Credit Facility contains affirmative and negative covenants, financial covenants and events of default, including without limitation restrictions on (a) the incurrence of additional indebtedness; (b) investments in and acquisitions of other businesses, lines of business and divisions; (c) the making of dividends or share purchases; and (d) dispositions of assets. Dividends and share repurchases are permitted in annual amounts not exceeding the greater of \$75 million annually and 25% of consolidated EBITDA if there is no default. If the consolidated net leverage ratio is less than 2.50 to 1.00, then the Company is no longer subject to restricted payments.

Financial covenants contained in the Amended Credit Facility include a consolidated interest coverage ratio test and a consolidated net leverage ratio test. The consolidated net leverage ratio at the end of a quarter may not be greater than 4.00 to 1.00, subject to a permitted increase during a four-quarter period after certain acquisitions. The Company has the option of replacing the consolidated net leverage ratio test with a consolidated senior net leverage ratio test if the Company issues certain types of unsecured notes, subject to certain limitations. Events of default in the Amended Credit Facility include without limitation defaults for non-payment, breach of representations and warranties, non-performance of covenants, cross-defaults, insolvency, and a change of control in certain circumstances. The occurrence of an event of default under the Amended Credit Facility could result in all loans and other obligations becoming immediately due and payable and the Amended Credit Facility being terminated. As of December 31, 2022 and December 31, 2021, the Company was in compliance with all of the Amended and Original Credit Facility covenants.

The weighted average variable interest rate incurred on the outstanding borrowings under the Original Credit Facility and the Amended Credit Facility during the twelve months ended December 31, 2022 was approximately 3.0%. As of December 31, 2022, the interest rate on the outstanding borrowings under the Amended Credit Facility was approximately 4.9%. In addition to paying interest on outstanding principal under the Original Credit Facility, the Company was required to pay a commitment fee ranging from 0.2% to 0.3% depending on the Company’s consolidated net leverage ratio under the Original Revolver in respect of the unutilized commitments thereunder. As part of the Amended Credit Facility, the Company is required to pay a commitment fee ranging from 0.150% to 0.275% related to unutilized commitments under the Amended Revolver, depending on the Company’s consolidated net leverage ratio.

The Company previously capitalized \$23.7 million of certain third-party debt issuance costs in connection with executing the Original Credit Facility. Approximately \$15.5 million of the capitalized costs were attributed to the Original Term Loans and recorded as a direct reduction of Long-term debt on the Company’s Consolidated Balance Sheet. Approximately \$8.3 million of the capitalized costs were attributed to the Original Revolver and recorded within Other assets on the Company’s Consolidated Balance Sheet. These capitalized costs are being amortized into interest expense over the five year term of the Original Credit Facility. Prior to executing the Amended Credit Facility, as of December 31, 2021, the Company had \$8.0 million of debt issuance costs recorded as a reduction of Long-term debt attributable to the Original Credit Facility and \$4.3 million of debt issuance costs recorded within Other assets attributable to the Original Credit Facility.

In connection with executing the Amended Credit Facility, the Company recorded a loss on extinguishment of debt of approximately \$6.8 million which includes the write-off of certain previously unamortized deferred financing costs as well as a portion of the third-party and creditor debt issuance costs incurred to execute the Amended Credit Facility. Also, in connection with executing the Amended Credit Facility, during the second quarter of 2022, the Company capitalized \$2.2 million of certain third-party and creditor debt issuance costs. Approximately \$0.7 million of the capitalized costs were attributed to the Amended Euro Term Loan and Amended U.S. Term Loan. These costs were recorded as a direct reduction of Long-term debt on the Consolidated Balance Sheet. Approximately \$1.5 million of the capitalized costs were attributed to the Amended Revolver and recorded within Other assets on the Consolidated Balance Sheet. These capitalized costs, as well as the previously capitalized costs that were not written off will collectively be amortized into Interest expense over the five year term of the Amended Credit Facility. As of December 31, 2022, the Company had \$2.0 million of debt issuance costs recorded as a reduction of Long-term debt on the Consolidated Balance Sheet and \$4.3 million of debt issuance costs recorded within Other assets on the Consolidated Balance Sheet.

The Original Credit Facility required the Company to fix its variable interest rates on at least 20% of its total Term Loans. In order to satisfy this requirement as well as to manage the Company's exposure to variable interest rate risk associated with the Original Credit Facility, in November 2019, the Company entered into \$170.0 million notional amounts of three year interest rate swaps at a base rate of 1.64% plus an applicable margin as provided in the Original Credit Facility, based on the Company's consolidated net leverage ratio. In October 2022, the Company's interest rate swap contracts expired. Upon expiration, the Company received a cash payment from the counterparties of \$0.2 million. See Note 25 of Notes to Consolidated Financial Statements.

As of December 31, 2022, the Company had Amended Credit Facility borrowings outstanding of \$943.5 million. The Company had unused capacity under the Amended Revolver of approximately \$301 million, which is net of bank letters of credit of approximately \$3 million, as of December 31, 2022. The Company's other debt obligations are primarily industrial development bonds, bank lines of credit and municipality-related loans, which totaled \$11.3 million as of December 31, 2022. Total unused capacity under these arrangements as of December 31, 2022 was approximately \$35 million. The Company's total net debt as of December 31, 2022 was \$773.8 million.

The Company incurred \$11.0 million of total Combination, integration and other acquisition-related expenses in 2022, which includes \$2.4 million of other expense related to an indemnification asset and is net of a \$0.2 million gain on the sale of certain held-for-sale real property assets, described in the Non-GAAP Measures section of this Item below. The Company had aggregate net cash outflows of approximately \$13.3 million related to Combination, integration and other acquisition-related expenses during 2022. Comparatively, in 2021, the Company incurred \$18.6 million of total Combination, integration and other acquisition-related expenses, including \$0.7 million of accelerated depreciation and is net of a \$5.4 million gain on the sale of certain held-for-sale real property assets, as well as a \$0.6 million of other income related to an indemnification asset. Net cash outflows related to these costs were approximately \$20.6 million during 2021.

During 2022, the Company incurred \$14.4 million of strategic planning expenses. The Company expects that these additional operating costs and associated cash flows, as well as higher capital expenditures related to strategic planning, process optimization and the next phase of the Company's long-term integration to further optimize its footprint, processes and other functions will continue in 2023 and extend into the next several years.

Quaker Houghton's management approved, and the Company initiated, a global restructuring plan (the "QH Program") in 2019 as part of its planned cost synergies associated with the Combination. The QH Program included restructuring and associated severance costs to reduce total headcount by approximately 400 people globally and plans for the closure of certain manufacturing and non-manufacturing facilities. As of December 31, 2022, the Company has substantially completed all of the initiatives under the QH Program with only an immaterial amount of remaining severance still to be paid, which is expected to be completed during 2023.

In response to current macroeconomic headwinds and softer operating conditions in 2022, the Company's Management initiated a global cost and optimization program to improve its cost structure and drive a more profitable and productive organization. This program has and will include certain restructuring activities as part of the plan to further optimize and strengthen the Company's footprint, optimize the go-to-market strategy, simplify the portfolio and organization, and enable the Company to deliver on its strategic plan. During the fourth quarter of 2022, initial actions under this program included restructuring and associated severance costs to reduce headcount by approximately 40 positions globally. These headcount reductions began in the fourth quarter of 2022 and are expected to be completed in 2023. The Company is continuing to evaluate and expects to implement further actions under this program, and as a result, additional headcount reductions and restructuring costs may be incurred in the future. Under the Company's restructuring programs, employee separation benefits varied depending on local regulations within certain foreign countries and included severance and other benefits. The exact timing to complete all actions and final costs associated will depend on a number of factors and are subject to change.

The Company recognized \$3.2 million, \$1.4 million and \$5.5 million of restructuring and related charges for the years ended December 31, 2022, 2021 and 2020, respectively, as a result of these programs. The Company made cash payments related to the settlement of restructuring liabilities for these programs of \$1.5 million and \$5.3 million during the years ended December 31, 2022 and 2021, respectively.

As of December 31, 2022, the Company's gross liability for uncertain tax positions, including interest and penalties, was \$20.3 million. The Company cannot determine a reliable estimate of the timing of cash flows by period related to its uncertain tax position liability. However, should the entire liability be paid, the amount of the payment may be reduced by up to \$6.1 million as a result of offsetting benefits in other tax jurisdictions. During 2021, the Company recorded \$13.1 million of non-income tax credits for certain of its Brazilian subsidiaries. The Company utilized these credits to offset certain Brazilian federal tax payments during 2022. See Note 26 of Notes to Consolidated Financial Statements in Item 8 of this Report.

During 2021, two of the Company's locations suffered property damage as a result of flooding and electrical fire, respectively. The Company maintains property insurance for all of its locations globally. The Company, its insurance adjuster, and insurance carrier are actively managing the remediation and restoration activities associated with each of these events. Based on all available information and discussions with its insurance adjuster and insurance carrier, that the losses incurred during 2021 are expected to be covered under the Company's property insurance coverage, net of an aggregate deductible of \$2.0 million. To date, the Company has received payments from its insurers of \$4.6 million and has recorded an insurance receivable associated with these events of \$0.2 million as of December 31, 2022. The Company and its insurance carrier continue to review the impact of the electrical fire on the production facility's operations as it relates to a potential business interruption insurance claim; however, as of the date of this Report, the Company cannot reasonably estimate any probable amount of business interruption insurance claim recoverable. Therefore, the Company has not recorded a gain contingency for a possible business interruption insurance claim as of December 31, 2022. See Note 26 of Notes to Consolidated Financial Statements in Item 8 of this Report.

The Company believes that its existing cash, anticipated cash flows from operations and available additional liquidity will be sufficient to support its operating requirements and fund its business objectives for at least the next twelve months and beyond, including but not limited to, payments of dividends to shareholders, payments for restructuring activities including further strategic and optimization initiatives, pension plan contributions, capital expenditures, other business opportunities (including potential acquisitions), implementing actions to achieve the Company's sustainability goals and other potential contingencies. The Company's liquidity is affected by many factors, some based on normal operations of our business and others related to the impact of the pandemic and other events on our business and on global economic conditions as well as industry uncertainties, which we cannot predict. We also cannot predict economic conditions and industry downturns or the timing, strength or duration of recoveries. We may seek, as we believe appropriate, additional debt or equity financing which would provide capital for corporate purposes, working capital funding, additional liquidity needs or to fund future growth opportunities, including possible acquisitions and investments. The timing and amount of potential capital requirements cannot be determined at this time and will depend on a number of factors, including the actual and projected demand for our products, specialty chemical industry conditions, competitive factors, and the condition of financial markets, among others.

The following table summarizes the Company's contractual obligations as of December 31, 2022, and the effect such obligations are expected to have on its liquidity and cash flows in future periods. Pension and postretirement plan contributions beyond 2022 are not determinable since the amount of any contribution is heavily dependent on the future economic environment and investment returns on pension trust assets. The timing of payments related to other long-term liabilities which consists primarily of deferred compensation agreements and environmental reserves, also cannot be readily determined due to their uncertainty. Interest obligations on the Company's long-term debt and capital leases assume the current debt levels will be outstanding for the entire respective period and apply the interest rates in effect as of December 31, 2022.

<i>(dollars in thousand)</i>	Payments due by period						
	Total	2023	2024	2025	2026	2027	2028 and Beyond
Contractual Obligations							
Long-term debt (See Note 20 of Notes to Consolidated Financial Statements)	\$ 954,240	\$ 19,063	\$ 23,740	\$ 37,745	\$ 37,705	\$ 825,964	\$ 10,02
Interest obligations (See Note 20 of Notes to Consolidated Financial Statements)	196,374	45,771	44,745	43,263	41,438	20,982	17
Capital lease obligations (See Note 6 of Notes to Consolidated Financial Statements)	813	210	25	186	196	16	18
Operating leases (See Note 6 of Notes to Consolidated Financial Statements)	45,002	13,551	11,149	7,266	5,280	2,457	5,29
Purchase obligations	5,756	5,687	69	—	—	—	—
Non-current income taxes payable (See Note 10 and Note 22 of Notes to Consolidated Financial Statements)	8,883	—	—	—	—	—	8,88
Pension and other postretirement plan contributions (See Note 21 of Notes to Consolidated Financial Statements)	13,187	13,187	—	—	—	—	—
Other long-term liabilities (See Note 22 of Notes to Consolidated Financial Statements)	9,148	—	—	—	—	—	9,14
Total contractual cash obligations	\$ 1,233,403	\$ 97,469	\$ 79,728	\$ 88,460	\$ 84,619	\$ 849,419	\$ 33,70

Non-GAAP Measures

The information in this Form 10-K filing includes non-GAAP (unaudited) financial information that includes EBITDA, adjusted EBITDA, adjusted EBITDA margin, non-GAAP operating income, non-GAAP operating margin, non-GAAP net income and non-GAAP earnings per diluted share. The Company believes these non-GAAP financial measures provide meaningful supplemental information as they enhance a reader's understanding of the financial performance of the Company, are indicative of future operating performance of the Company, and facilitate a comparison among fiscal periods, as the non-GAAP financial measures exclude items that are not indicative of future operating performance or not considered core to the Company's operations. Non-GAAP results are presented for supplemental informational purposes only and should not be considered a substitute for the financial information presented in accordance with GAAP.

The Company presents EBITDA which is calculated as net income attributable to the Company before depreciation and amortization, interest expense, net, and taxes on income before equity in net income of associated companies. The Company also presents adjusted EBITDA which is calculated as EBITDA plus or minus certain items that are not indicative of future operating performance or not considered core to the Company's operations. In addition, the Company presents non-GAAP operating income which is calculated as operating income plus or minus certain items that are not indicative of future operating performance or not considered core to the Company's operations. Adjusted EBITDA margin and non-GAAP operating margin are calculated as the percentage of adjusted EBITDA and non-GAAP operating income to consolidated net sales, respectively. The Company believes these non-GAAP measures provide transparent and useful information and are widely used by analysts, investors, and competitors in our industry as well as by management in assessing the operating performance of the Company on a consistent basis.

Additionally, the Company presents non-GAAP net income and non-GAAP earnings per diluted share as additional performance measures. Non-GAAP net income is calculated as adjusted EBITDA, defined above, less depreciation and amortization, interest expense, net, and taxes on income before equity in net income of associated companies, in each case adjusted, as applicable, for any depreciation, amortization, interest or tax impacts resulting from the non-core items identified in the reconciliation of net income attributable to the Company to adjusted EBITDA. Non-GAAP earnings per diluted share is calculated as non-GAAP net income per diluted share as accounted for under the “two-class share method.” The Company believes that non-GAAP net income and non-GAAP earnings per diluted share provide transparent and useful information and are widely used by analysts, investors, and competitors in our industry as well as by management in assessing the operating performance of the Company on a consistent basis.

Certain of the prior period non-GAAP financial measures presented in the following tables have been adjusted to conform with current period presentation. The following tables reconcile the Company’s non-GAAP financial measures (unaudited) to their most directly comparable GAAP financial measures (dollars in thousands, unless otherwise noted, except per share amounts):

Non-GAAP Operating Income and Margin Reconciliations

	For the years ended December 31,		
	2022	2021	2020
Operating income	\$ 52,304	\$ 150,466	\$ 59,360
Combination, restructuring and other acquisition-related expenses (a)	11,975	26,845	36,213
Strategic planning expenses (b)	14,446	—	—
Executive transition costs (c)	2,813	2,986	—
Russia-Ukraine conflict related expenses (k)	2,487	—	—
Facility remediation (recovery) costs, net (d)	—	1,509	—
Impairment charges (e)	93,000	—	38,000
Other charges (j)	866	819	463
Non-GAAP operating income	<u>\$ 177,891</u>	<u>\$ 182,625</u>	<u>\$ 134,036</u>
Non-GAAP operating margin (%) (p)	9.2 %	10.4 %	9.5 %

**EBITDA, Adjusted EBITDA, Adjusted EBITDA Margin and Non-GAAP
Net Income Reconciliations**

	For the years ended December 31,		
	2022	2021	2020
Net (loss) income attributable to Quaker Chemical Corporation	\$ (15,931)	\$ 121,369	\$ 39,658
Depreciation and amortization (a)(n)	81,514	87,728	84,494
Interest expense, net	32,579	22,326	26,603
Taxes on income (loss) before equity in net income of associated companies (o)	24,925	34,939	(5,296)
EBITDA	123,087	266,362	145,459
Equity income in a captive insurance company (f)	1,427	(4,993)	(1,151)
Combination, restructuring and other acquisition-related expenses (a)	14,153	20,151	35,305
Strategic planning expenses (b)	14,446	—	—
Executive transition costs (c)	2,813	2,986	—
Facility remediation (recovery) costs, net (d)	(1,804)	2,066	—
Impairment charges (e)	93,000	—	38,000
Pension and postretirement benefit (income) costs, non-service components (g)	(1,704)	(759)	21,592
Gain on changes in insurance settlement restrictions of an inactive subsidiary and related insurance insolvency recovery (h)	—	—	(18,144)
Brazilian non-income tax credits (i)	—	(13,087)	—
Russia-Ukraine conflict related expenses (k)	2,487	—	—
Loss on extinguishment of debt (l)	6,763	—	—
Other charges (j)	2,482	1,383	913
Adjusted EBITDA	<u>\$ 257,150</u>	<u>\$ 274,109</u>	<u>\$ 221,974</u>
Adjusted EBITDA margin (%) (p)	13.2 %	15.6 %	15.7 %
Adjusted EBITDA	\$ 257,150	\$ 274,109	\$ 221,974
Less: Depreciation and amortization - adjusted (a)	81,514	87,002	83,732
Less: Interest expense, net	32,579	22,326	26,603
Less: Taxes on income (loss) before equity in net income of associated companies - adjusted (m)(o)	37,737	41,976	26,488
Non-GAAP net income	<u>\$ 105,320</u>	<u>\$ 122,805</u>	<u>\$ 85,151</u>

Non-GAAP Earnings per Diluted Share Reconciliations

	For the years ending December 31,		
	2022	2021	2020
GAAP earnings per diluted share attributable to Quaker Chemical Corporation common shareholders	\$ (0.89)	\$ 6.77	\$ 2.22
Equity income in a captive insurance company per diluted share (f)	0.08	(0.28)	(0.07)
Combination, restructuring and other acquisition-related expenses per diluted share (a)	0.62	0.89	1.55
Strategic planning expenses per diluted share (b)	0.63	—	—
Executive transition costs per diluted share (c)	0.12	0.13	—
Facility remediation (recovery) costs, net per diluted share (d)	(0.08)	0.09	—
Impairment charges per diluted share (e)	5.19	—	1.65
Pension and postretirement benefit costs, non-service components per diluted share (g)	(0.08)	(0.04)	0.79
Gain on changes in insurance settlement restrictions of an inactive subsidiary and related insurance insolvency recovery per diluted share (h)	—	—	(0.78)
Brazilian non-income tax credits per diluted share (i)	—	(0.46)	—
Russia-Ukraine conflict related expenses per diluted share (k)	0.12	—	—
Loss on extinguishment of debt per diluted share (l)	0.29	—	—
Other charges per diluted share (i)	0.13	0.07	0.04
Impact of certain discrete tax items per diluted share (m)	(0.26)	(0.32)	(0.62)
Non-GAAP earnings per diluted share (q)	\$ 5.87	\$ 6.85	\$ 4.78

- (a) Combination, restructuring and other acquisition-related expenses include certain legal, financial, and other advisory and consultant costs incurred in connection with the Combination integration activities including internal control readiness and remediation. These amounts also include expense associated with the Company's other recent acquisitions, including certain legal, financial, and other advisory and consultant costs incurred in connection with due diligence as well as costs associated with selling inventory from acquired businesses which was adjusted to fair value as part of purchase accounting. These costs are not indicative of the future operating performance of the Company. Approximately \$0.2 million, \$0.6 million and \$1.5 million for the years ended December 31, 2022, 2021 and 2020, respectively, of these pre-tax costs were considered non-deductible for the purpose of determining the Company's effective tax rate, and, therefore, taxes on income before equity in net income of associated companies - adjusted reflects the impact of these items. During 2021 and 2020, the Company recorded \$0.7 million and \$0.8 million, respectively, of accelerated depreciation related to certain of the Company's facilities, which is included in the caption "Combination, restructuring and other acquisition-related expenses" in the reconciliation of operating income to non-GAAP operating income and included in the caption "Depreciation and amortization" in the reconciliation of net income attributable to the Company to EBITDA, but excluded from the caption "Depreciation and amortization – adjusted" in the reconciliation of adjusted EBITDA to non-GAAP net income attributable to the Company. During 2022, 2021 and 2020, the Company recorded \$2.4 million of other expense and, \$0.6 million and \$0.8 million, respectively, of other income related to an indemnification asset. During 2022, 2021 and 2020, the Company recorded restructuring and related charges of \$3.2 million, \$1.4 million and \$5.5 million, respectively. During 2021 and 2020, the Company recorded \$0.8 million and \$0.2 million, respectively, related to the sale of inventory from acquired businesses which was adjusted to fair value. During 2022, 2021 and 2020, the Company recorded a gain of \$0.2 million, a gain of \$5.4 million and a loss of \$0.6 million, respectively, on the sale of certain held-for-sale real property assets related to the Combination. Each of these items are included in the caption "Combination, restructuring and other acquisition-related expenses" in the reconciliation of GAAP earnings per diluted share attributable to Quaker Chemical Corporation common shareholders to Non-GAAP earnings per diluted share as well as the reconciliation of Net Income attributable to Quaker Chemical Corporation to Adjusted EBITDA and Non-GAAP net income. See Notes 2, 7, 9 and 10 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (b) Strategic planning expenses include certain consultant and advisory expenses for the Company's long-term strategic planning, as well as process optimization and the next phase of the Company's long-term integration to further optimize its footprint, processes and other functions. These costs are not indicative of the future operating performance of the Company.
- (c) Executive transition costs represent the costs related to the Company's search, hiring and transition to a new CEO in connection with the executive transition that occurred in 2021 as well as the, hiring and transition for other officers during 2022. These expenses are one-time in nature and are not indicative of the future operating performance of the Company.

- (d) Facility remediation (recovery) costs, net, presents the gross costs associated with remediation, cleaning and subsequent restoration costs associated with the property damage to certain of the Company's facilities, net of insurance recoveries received. These charges are non-recurring and are not indicative of the future operating performance of the Company. See Note 26 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (e) Impairment charges represents the non-cash charges taken to write down the value of goodwill and indefinite-lived intangible assets. These charges are not indicative of the future operating performance of the Company. See Note 16 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (f) Equity income in a captive insurance company represents the after-tax income attributable to the Company's interest in Primex, Ltd. ("Primex"), a captive insurance company. The Company holds a 32% investment in and has significant influence over Primex, and therefore accounts for this investment under the equity method of accounting. The income attributable to Primex is not indicative of the future operating performance of the Company and is not considered core to the Company's operations. See Note 17 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (g) Pension and postretirement benefit (income) costs, non-service components represent the pre-tax, non-service components of the Company's pension and postretirement net periodic benefit cost in each period. These costs are not indicative of the future operating performance of the Company. The year ended December 31, 2020 includes a \$22.7 million settlement charge for the Company's termination of a noncontributory U.S. pension plan. See Note 21 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (h) Gain on changes in insurance settlement restrictions of an inactive subsidiary and related insurance insolvency recovery represents income associated with the gain on the termination of restrictions on insurance settlement reserves and the cash receipts from an insolvent insurance carrier for previously submitted claims by an inactive subsidiary of the Company. This other income is not indicative of the future operating performance of the Company. See Notes 9 and 26 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (i) Brazilian non-income tax credits represent indirect tax credits related to certain of the Company's Brazilian subsidiaries prevailing in a legal claim as well as the Brazil Supreme Court ruling on these non-income tax matters. The non-income tax credit is non-recurring and not indicative of the future operating performance of the Company. See Note 26 of Note to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (j) Other charges include charges incurred by an inactive subsidiary of the Company as a result of the termination of restrictions on insurance settlement reserves, the foreign currency remeasurement impacts associated with the Company's affiliates whose local economies are designated as hyper-inflationary under U.S. GAAP and costs associated with specific reserves for trade accounts receivable related to a customer who filed for bankruptcy during 2020. These expenses are not indicative of the future operating performance of the Company. See Notes 1 and 13 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.
- (k) Russia-Ukraine conflict related expenses represent the direct costs associated with the Company's exit of operations in Russia during 2022, primarily employee separation benefits, as well as costs associated with establishing specific reserves or changes to existing reserves for trade accounts receivable within the Company's EMEA reportable segment due to the economic instability associated with certain customer accounts receivables which have been directly impacted by the current economic conflict between Russia and Ukraine or the Company's decision to end operations in Russia. These expenses are not indicative of the future operating performance of the Company. See Note 13 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.
- (l) In connection with executing the Amended Credit Facility, the Company recorded a loss on extinguishment of debt of approximately \$6.8 million which includes the write-off of certain previously unamortized deferred financing costs as well as a portion of the third-party and creditor debt issuance costs incurred to execute the Amended Credit Facility. These expenses are not indicative of the future operating performance of the Company. See Note 20 of Notes to Consolidated Financial Statements, which appear in Item 8 of this Report.
- (m) The impacts of certain discrete tax items includes the impact of changes in valuation allowances recorded on certain of the Company's foreign tax credits, tax law changes in foreign jurisdictions, changes in withholding tax rates, the tax impacts of non-income tax credits associated with certain of the Company's Brazilian subsidiaries and the associated impact on previously accrued for distributions at certain of the Company's Asia/Pacific subsidiaries, deferred tax benefits recorded on the transfer of intangible assets between the Company's subsidiaries as well as the offsetting impact and amortization of a deferred tax benefit the Company recorded during 2020 related to similar intercompany intangible asset transfers. See Note 10 of Notes to Consolidated Financial Statements, which appears in Item 8 of this Report.
- (n) Depreciation and amortization for the years ended December 31, 2022, 2021 and 2020 includes \$1.0 million, \$1.2 million and \$1.2 million, respectively, of amortization expense recorded within equity in net income of associated companies in the Company's Consolidated Statements of Operations, which is attributable to the amortization of the fair value step up for the Company's 50% interest Korea Houghton Corporation as a result of required purchase accounting.

- (o) Taxes on income before equity in net income of associated companies – adjusted presents the impact of any current and deferred income tax expense (benefit), as applicable, of the reconciling items presented in the reconciliation of net income attributable to Quaker Chemical Corporation to adjusted EBITDA, and was determined utilizing the applicable rates in the taxing jurisdictions in which these adjustments occurred, subject to deductibility. Combination, restructuring and other acquisition-related expenses described in (a) resulted in incremental taxes of \$2.8 million for 2022, \$4.7 million for 2021, and \$8.3 million for 2020. Strategic planning expenses described in (b) resulted in incremental taxes of \$3.3 million for 2022. Executive transition costs described in (c) resulted in incremental taxes of \$0.6 million and \$0.7 million for the years 2022 and 2021, respectively. Facility remediation costs, net described in (d) results in a tax benefit of \$0.4 million for 2022 and incremental taxes of \$0.5 million for 2021. Impairment charges described in (e) resulted in incremental taxes of \$8.7 million for 2020. Pension and postretirement benefit (income) costs, non-service components described in (g) resulted in a reduction of taxes of \$0.3 million and \$0.1 million for 2022 and 2021, respectively, and incremental taxes of \$7.5 million for 2020. Gain on changes in insurance settlement restrictions of an inactive subsidiary and related insurance insolvency recovery described in (h) resulted in a reduction of taxes of \$4.2 million in 2020. Brazilian non-income tax credits described in (i) resulted in a reduction of taxes of \$4.8 million for 2021. Other charges described in (j) resulted in incremental taxes of \$0.2 million, \$0.2 million and \$0.1 million during 2022, 2021 and 2020, respectively. Russia-Ukraine conflict related expenses described in (k) resulted in incremental taxes of \$0.5 million for 2022. Loss on extinguishment of debt described in (l) resulted in incremental taxes of \$1.6 million for 2022. The impact of certain discrete tax items described in (m) resulted in incremental taxes of \$4.4 million for 2022, a tax benefit of \$5.8 million for 2021, and incremental taxes of \$11.2 million for 2020.
- (p) The Company calculates adjusted EBITDA margin and non-GAAP operating margin as the percentage of adjusted EBITDA and non-GAAP operating income to consolidated net sales.
- (q) The Company calculates non-GAAP earnings per diluted share as non-GAAP net income attributable to the Company per weighted average diluted shares outstanding using the “two-class share method” to calculate such in each given period.

Off-Balance Sheet Arrangements

The Company had no material off-balance sheet commitments or obligations as of December 31, 2022. The Company’s only off-balance sheet commitments or obligations outstanding as of December 31, 2022 represented approximately \$5 million of total bank letters of credit and guarantees. The bank letters of credit and guarantees are not significant to the Company’s liquidity or capital resources. See Note 20 of Notes to Consolidated Financial Statements in Item 8 of this Report.

Operations

Consolidated Operations Review – Comparison of 2022 with 2021

Net sales were a record \$1,943.6 million in 2022 compared to \$1,761.2 million in 2021. The increase in net sales of approximately \$182.4 million or 10% year-over-year was primarily due to an increase in selling price and product mix of approximately 22% and additional net sales from acquisitions of 1%, partially offset by a decline in organic sales volumes of approximately 7% and the unfavorable impact from foreign currency translation of approximately 6%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material and other input costs that began during 2021 and continued throughout 2022. The decline in organic sales volumes was primarily attributable to softer end market demand, particularly in the EMEA and Asia/Pacific segments, the wind-down of the tolling agreement for products previously divested related to the Combination and the impact of the ongoing war in Ukraine, partially offset by net new business wins, including the impact of the Company’s ongoing value-based pricing initiatives. The impact from foreign currency translation is primarily the result of the year-over-year strengthening of the U.S. Dollar compared to major world currencies including the Euro and the Chinese renminbi.

COGS were \$1,330.9 million in 2022 compared to \$1,166.5 million in 2021. The increase in COGS of 14% was driven by the continued increases in the Company’s global raw material, manufacturing and supply chain and logistics costs compared to the prior year.

Gross profit in 2022 of \$612.7 million increased \$18.0 million or approximately 3% from 2021. The Company’s reported gross margin in 2022 was 31.5% compared to 33.8% in 2021. The Company’s current year gross margin reflects a significant increase in raw material and other input costs and the impacts of constraints on the global supply chain, partially offset by the Company’s ongoing value-based pricing initiatives.

SG&A in 2022 increased \$36.6 million compared to 2021 due primarily to the impact of sales increases on direct selling costs, higher operating costs due to inflationary pressures, costs associated with strategic planning initiatives (see the Non-GAAP Measures section of this Item, above), and additional SG&A from recent acquisitions, partially offset by lower SG&A due to foreign currency translation compared to the prior year. In addition, SG&A was lower in the prior year period as a result of continued temporary cost saving measures the Company implemented in response to the onset of COVID-19.

During 2022 and 2021, the Company incurred \$8.8 million and \$23.9 million, respectively, of Combination, integration and other acquisition-related expenses. See the Non-GAAP Measures section of this Item, above.

The Company incurred restructuring expenses of \$3.2 million and \$1.4 million during 2022 and 2021, respectively, related to the Company's restructuring programs. See the Non-GAAP Measures section of this Item, above.

In 2022, the Company recorded a \$93.0 million non-cash impairment charge to write down the value of goodwill associated with the Company's EMEA reportable segment. This non-cash impairment charge is the result of the Company's trigger based fourth quarter of 2022 impairment assessment. There were no similar impairment charges in 2022 and no charges in 2021. See the Critical Accounting Policies and Estimates section as well as the Non-GAAP Measures section, of this Item, above.

Operating income in 2022 was \$52.3 million compared to \$150.5 million in 2021. Excluding the non-cash impairment charge, as well as other non-core items that are not indicative of future operating performance, the Company's current year non-GAAP operating income was \$177.9 million compared to \$182.6 million in the prior year. The decline in non-GAAP operating income was primarily due to the higher SG&A, as described above.

Other expense in 2022 includes \$6.8 million of loss on extinguishment of debt related to the Company's refinancing the Original Credit Facility, partially offset by \$1.8 million of facility remediation insurance recoveries and \$2.4 million of other income related to an indemnification asset. Other income in 2021 includes \$13.1 million of non-income tax credits recorded by the Company's Brazilian subsidiaries as well as a \$4.8 million gain on the sale of certain held-for-sale real property assets. See the Non-GAAP Measures section of this Item, above. In addition, foreign exchange losses, net, were higher in 2022 as compared to 2021.

Interest expense, net, increased \$10.3 million compared to 2021, primarily driven by increases in the average borrowings outstanding coupled with an increase in interest rates year-over-year as the weighted average interest rate incurred on borrowings under the Company's primary credit facility was approximately 3.0% during 2022 compared to approximately 1.6% during 2021. This was partially offset by lower amortization of debt issuance costs in 2022 as compared to 2021 due to the June 2022 credit facility amendment and write off of certain previously capitalized debt issuance costs.

The Company's effective tax rates for 2022 and 2021 were an expense of 350.2% and an expense of 23.8%, respectively. The Company's current year effective tax rate was largely driven by the non-cash impairment charge described above and to a lesser extent a decline in profits, earnings mix, foreign tax inclusions and withholding taxes, partially offset by a reduction in reserves for uncertain tax positions and changes in the valuation allowance for foreign tax credits. The Company's 2021 effective tax rate was driven by a higher level of pre-tax earnings and mix of earnings, as well as a deferred tax expense related to the planned repatriation of non-U.S. earnings. In addition, the rate was impacted by certain one-time charges and benefits related to an intercompany intangible asset transfer and related royalty income recognition offset by changes in the valuation allowance for foreign tax credits. Excluding the impact of all non-core items in each year, described in the Non-GAAP Measures section of this Item, above, the Company estimates that the 2022 and 2021 effective tax rates would have been approximately 27% and 26%, respectively. The higher estimated current year tax rate was primarily driven by a lower level of pre-tax earnings and the impact of changes in mix of earnings. The Company may experience continued volatility in its effective tax rates due to several factors, including the timing of tax audits and the expiration of applicable statutes of limitations as they relate to uncertain tax positions, the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, the treatment of certain acquisition-related costs and the timing and amount of certain share-based compensation-related tax benefits, among other factors. In addition, the foreign tax credit valuation allowance, or absence thereof, is based on a number of variables, including forecasted earnings, which may vary.

Equity in net income of associated companies decreased \$7.4 million in 2022 compared to 2021, primarily due to lower current year income from the Company's interest in a captive insurance company (see the Non-GAAP Measures section of this Item, above) due to lower market performance on equity investments and from the Company's 50% interest in a joint venture in Korea due to overall market challenges.

Net income attributable to noncontrolling interest was less than \$0.1 million for both 2022 and 2021.

Foreign exchange negatively impacted the Company's yearly results by approximately 8% driven by the negative impact from foreign currency translation on earnings as well as higher foreign exchange transaction losses in the current year as compared to the prior year.

Consolidated Operations Review – Comparison of 2021 with 2020

Net sales were \$1,761.2 million in 2021 compared to \$1,417.7 million in 2020. The net sales increase of approximately \$343.5 million or 24% year-over-year was primarily due to higher sales volumes of 13%, which includes additional net sales from recent acquisitions of 4%, increases from selling price and product mix of 8% and the positive impact of foreign currency translation of 3%. The increase in organic sales volumes compared to 2020 was primarily the result of the continued year-over-year improvement in end market conditions from the prior year impacts of COVID-19 and continued market share gains. Sales from acquisitions are primarily driven by the Company's acquisition of Coral Chemical Company ("Coral") in December 2020 and the tin-plating solutions business acquired in February 2021. The increase from selling price and product mix includes the impact of current year selling price increases implemented in response to the increases in raw material costs experienced in 2021. The positive impact from foreign currency translation is primarily the result of the strengthening of the Chinese renminbi, euro, Mexican peso, the Canadian dollar and the British pound against the U.S. dollar year-over-year.

COGS were \$1,166.5 million in 2021 compared to \$904.2 million in 2020. The increase in COGS of 29% was driven by the associated COGS on the increase in net sales described above, and continued increases in the Company's global raw material costs compared to the prior year and the impacts of supply constraints in the current year.

Gross profit in 2021 of \$594.6 million increased \$81.2 million or approximately 16% from 2020, due primarily to the increase in net sales noted above. The Company's reported gross margin in 2021 was 33.8% compared to 36.2% in 2020. The lower current year gross margin is primarily attributable to increased raw materials and other costs that began in the fourth quarter of 2020 and have continued throughout 2021 and the impacts of constraints on the world's global supply chain partially offset by the Company's ongoing pricing initiatives.

SG&A in 2021 increased \$38.1 million compared to 2020 due primarily to the impact of sales increases on direct selling costs, year-over-year inflation increases, additional SG&A from recent acquisitions and higher SG&A due to foreign currency translation, partially offset by lower incentive compensation year-over-year as well as the benefits of additional realized cost synergies associated with the Combination year-over-year. In addition, SG&A was lower in the prior year period as a result of temporary cost saving measures the Company implemented in response to COVID-19. While the Company continues to manage costs during the ongoing pandemic, it has incurred higher SG&A year-over-year as the global economy continues to gradually rebound.

During 2021 and 2020, the Company incurred \$23.9 million and \$29.8 million, respectively, of Combination, integration and other acquisition-related expenses primarily for professional fees related to Houghton integration and other acquisition-related activities. See the Non-GAAP Measures section of this Item, above.

The Company initiated a restructuring program during 2019 as part of its global plan to realize cost synergies associated with the Combination. The Company incurred restructuring and related charges for reductions in headcount and site closures under this program, net of adjustments to initial estimates for severance, of an expense of \$1.4 million and \$5.5 million during 2021 and 2020, respectively. See the Non-GAAP Measures section of this Item, above.

Operating income in 2021 was \$150.5 million compared to \$59.4 million in 2020. Excluding Combination, integration and other acquisition-related expenses, restructuring and related charges and other non-core items, the Company's current year non-GAAP operating income of \$182.6 million increased compared to \$134.0 million in the prior year, primarily due to the increase in net sales described above and the benefits from cost savings related to the Combination offset by an increase in SG&A as well as the significant increases in raw material costs year-over-year. The Company estimates that it realized cost synergies associated with the Combination of approximately \$75 million during 2021 compared to approximately \$58 million during 2020.

The Company had other (expense) income, net, of \$18.9 million in 2021 compared to other expense, net, of \$5.6 million in 2020. The year-over-year change was primarily a result of other income related to certain non-income tax credits recorded by the Company's Brazilian subsidiaries, the gain on the sale of certain held-for-sale real property assets and lower foreign currency transaction losses in 2021 as compared to the prior year. The Company had non-service components of pension and postretirement benefit income in the current year compared to an expense in the prior year as a result of the \$22.7 million pension settlement charge directly related to the termination of a noncontributory U.S. pension plan partially offset by a \$18.1 million gain related to the lapse of restrictions over certain cash that was previously designated solely for the settlement of asbestos claims at an inactive subsidiary, all of which are described in the Non-GAAP Measures section of this Item, above.

Interest expense, net, decreased \$4.3 million compared to 2020 driven by lower current year average borrowings outstanding as a result of the additional revolver borrowings drawn during part of 2020 at the onset of the pandemic to add additional liquidity, coupled with a decline in overall interest rates year-over-year, as the weighted average interest rate incurred on borrowings under the Company's credit facility was approximately 1.6% during 2021 compared to approximately 2.2% during 2020.

The Company's effective tax rates for 2021 and 2020 were an expense of 23.8% and benefit of 19.5%, respectively. The Company's higher current year effective tax rate is driven by a higher level of pre-tax earnings and mix of earnings, as well as deferred tax expense related to the planned repatriation of non-U.S. earnings. In addition, the rate was impacted by certain one-time charges and benefits related to an intercompany intangible asset transfer and related royalty income recognition offset by changes in the valuation allowance for foreign tax credits. Comparatively, the prior year effective tax rate was impacted by the tax effect of certain one-time tax charges and benefits related to a 2020 intercompany intangible asset transfer, additional charges for uncertain tax positions relating to certain foreign tax audits, and the tax impact of the Company's termination of a noncontributory U.S. pension plan. Excluding the impact of these items as well as all other non-core items in each year, described in the Non-GAAP Measures section of this Item, above, the Company estimates that the 2021 and 2020 effective tax rates would have been approximately 26% and 25%, respectively. The higher estimated current year tax rate was primarily driven by a higher level of pre-tax earnings and the impact of changes in mix of earnings, deferred taxes related to the planned repatriation of non-U.S. earnings, and provision to return adjustments in the prior period. The Company may experience continued volatility in its effective tax rates due to several factors, including the timing of tax audits and the expiration of applicable statutes of limitations as they relate to uncertain tax positions, the unpredictability of the timing and amount of certain incentives in various tax jurisdictions, the treatment of certain acquisition-related costs and the timing and amount of certain share-based compensation-related tax benefits, among other factors. In addition, the foreign tax credit valuation allowance, or absence thereof, is based on a number of variables, including forecasted earnings, which may vary.

Equity in net income of associated companies increased \$2.0 million in 2021 compared to 2020, primarily due to higher current year income from the Company's interest in a captive insurance company partially offset by lower earnings from the Company's 50% interest in a joint venture in Korea compared to the prior year. See the Non-GAAP Measures section of this Item, above.

Net income attributable to noncontrolling interest was less than \$0.1 million in 2021 compared to \$0.1 million in 2020 primarily a result of the first quarter of 2020 acquisition of the remaining ownership interest in one of the Company's South African affiliates.

Foreign exchange positively impacted the Company's yearly results by approximately 6% driven by the positive impact from foreign currency translation on earnings as well as lower foreign exchange transaction losses in the current year as compared to the prior year.

Reportable Segments Review - Comparison of 2022 with 2021

The Company's reportable segments reflect the structure of the Company's internal organization, the method by which the Company's resources are allocated and the manner by which the chief operating decision maker of the Company assesses its performance. The Company has three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific. The segments are composed of the net sales and operations in each respective region.

Segment operating earnings for the Company's reportable segments are comprised of net sales less COGS and SG&A directly related to the respective segment's sales of products and services. Operating expenses not directly attributable to the net sales of each respective segment, such as certain corporate and administrative costs, Combination, integration and other acquisition-related expenses, Restructuring and related charges, and COGS related to acquired inventory sold, which is adjusted to fair value as part of purchase accounting, are not included in segment operating earnings. Other items not specifically identified with the Company's reportable segments include interest expense, net, and other income (expense), net.

Americas

Americas represented approximately 49% of the Company's consolidated net sales in 2022. The segment's net sales were \$946.5 million, an increase of \$184.3 million or 24% compared to 2021. The increase in net sales was due to higher selling price and product mix of 28% and additional net sales from acquisition of 1%, partially offset by a decrease in organic sales volumes of approximately 5%. The increase in selling price and product mix is primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The current year decline in organic sales volumes was primarily driven by softer end market conditions, primarily in the automotive industry, due to the semiconductor supply constraints and to a lesser extent the primary metals markets, the wind-down of the tolling agreement for products previously divested related to the Combination, the Company's ongoing value-based pricing initiatives, partially offset by net new business wins. This segment's operating earnings were \$223.6 million, an increase of \$47.4 million or 27% compared to 2021 primarily driven by higher margins as the Company's ongoing value-based pricing initiatives offset the ongoing inflationary pressures on the business.

EMEA

EMEA represented approximately 29% of the Company's consolidated net sales in 2022. The segment's net sales were \$562.5 million, a decrease of \$1.6 million or less than 1% compared to 2021. The decrease in net sales was a result of a 20% increase in selling price and product mix and additional net sales from acquisition of 2% which was more than offset by an unfavorable impact of foreign currency translation of 15% and a decrease in sales volumes of 7%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The decline in sales volumes was primarily driven by current geopolitical and macroeconomic pressures including the direct and indirect impacts of the ongoing war in Ukraine and the impact of the economic and other sanctions by other nations on Russia in response to the war, as well as the wind-down of the tolling agreement for products previously divested related to the Combination and softer economic conditions in the region. The significant and unfavorable foreign currency translation impact was primarily due to the strengthening of the U.S. dollar against the euro as this exchange rate averaged 1.05 in 2022 compared to 1.18 in 2021. This segment's operating earnings were \$76.4 million, a decrease of \$34.6 million or 31% compared to 2021. The decrease in segment operating earnings was primarily a result of lower net sales, lower gross margins, and inflationary pressures on other costs, including SG&A.

Asia/Pacific

Asia/Pacific represented approximately 22% of the Company's consolidated net sales in 2022. The segment's net sales were \$434.6 million, a decrease of less than 1% or approximately \$0.3 million compared to 2021. The decrease in net sales was a result of a 15% increase in selling price and product mix offset by lower sales volumes of 10% and an unfavorable impact from foreign currency translation of 5%. The increase in selling price and product mix was primarily driven by price increases implemented to offset the significant increases in raw material, manufacturing and other input costs that began during 2021 and continued through 2022. The decline in organic sales volumes was primarily driven by softer market conditions, primarily in China, in part as a result of the government imposed COVID-19 quarantine and related production disruptions implemented at the end of March 2022 and continued throughout 2022, partially offset by net new business wins. The unfavorable foreign exchange impact was primarily due to the strengthening of the U.S. dollar against the Chinese renminbi as this exchange rate averaged 6.71 Chinese renminbi per USD in 2022 compared to 6.45 Chinese renminbi per USD in 2021. This segment's operating earnings were \$105.8 million, a decrease of \$3.4 million or 3% compared to 2021 as a result of lower net sales, lower gross margins, and inflationary pressures on other costs, including SG&A.

Reportable Segments Review – Comparison of 2021 with 2020

Americas

Americas represented approximately 43% of the Company's consolidated net sales in 2021. The segment's net sales were \$762.2 million, an increase of \$155.2 million or 26% compared to 2020. The increase in net sales was driven by a benefit in selling price and product mix of 3%, increases in organic volumes of approximately 17%, additional net sales from acquisitions of 5%, and the positive impact of foreign currency translation of 1%. The current year organic volume increase was driven by the continued improvement in end market conditions compared to the prior year which was impacted by COVID-19. The increase in selling price and product mix is primarily driven by price increases implemented to help offset the significant increases in raw material and other input costs incurred during 2021. The foreign exchange impact was primarily driven by the strengthening of the Mexican peso against the U.S. dollar, as this exchange rate averaged 20.27 in 2021 compared to 21.34 during 2020. This segment's operating earnings were \$176.3 million, an increase of \$34.4 million or 24% compared to 2020. The increase in segment operating earnings reflects the higher net sales, described above, partially offset by lower gross margins driven by the continued raw material cost increases and global supply chain and logistics pressures coupled with higher SG&A including an increase in direct selling costs associated with higher net sales, SG&A from acquisitions and an increase in SG&A as the prior year included temporary cost savings measures implemented in response to the onset of the COVID-19 pandemic.

EMEA

EMEA represented approximately 32% of the Company's consolidated net sales in 2021. The segment's net sales were \$564.1 million, an increase of \$108.2 million or 24% compared to 2020. The increase in net sales was driven by a benefit from selling price and product mix of 8%, increases in organic volumes of approximately 11%, the positive impact of foreign currency translation of 3%, and additional net sales from acquisitions of 2%. The increase in selling price and product mix is primarily driven by price increases implemented to offset the significant increase in raw material and other input costs incurred during 2021. The current year volume increase was driven by the continued improvement in end market conditions compared to the prior year which was heavily impacted by COVID-19. The foreign exchange impact was primarily driven by the strengthening of the euro against the U.S. dollar as this exchange rate averaged 1.18 in 2021 compared to 1.14 in 2020. This segment's operating earnings were \$111.0 million, an increase of \$18.5 million or 20% compared to 2020. The increase in segment operating earnings reflects the higher net sales described above, partially offset by lower current year gross margins driven by the continued raw material cost increases and global supply chain and logistics pressures as well as higher SG&A including increases in direct selling costs associated with higher net sales as well as increases as the prior year included temporary cost savings measures implemented in response to the onset of the COVID-19 pandemic.

Asia/Pacific

Asia/Pacific represented approximately 25% of the Company's consolidated net sales in 2021. The segment's net sales were \$434.8 million, an increase of approximately \$80.1 million or 23% compared to 2020. The increase in net sales year-over-year was driven by increases in volumes of approximately 10%, the positive impact of foreign currency translation of 4%, increases from selling price and product mix of 8% and additional net sales from acquisitions of 1%. The current year volume increase was driven by the continued improvement in end market conditions compared to the prior year which was impacted by COVID-19. Additionally, changes in selling price and product mix and sales volumes were driven by higher amounts of shipments of a lower priced product in the Company's mining business in the prior year. The foreign exchange impact was primarily due to the strengthening of the Chinese renminbi against the U.S. dollar as this exchange rate averaged 6.45 in 2021 compared to 6.90 in 2020. This segment's operating earnings were \$109.2 million, an increase of \$9.0 million or 9% compared to 2020. The increase in segment operating earnings was driven by the higher net sales described above, partially offset by lower gross margins driven by the continued raw material cost increases and global supply chain and logistics pressures as well as higher direct selling costs associated with higher net sales and an increase in SG&A as the prior year included temporary cost savings measures implemented in response to the onset of the COVID-19 pandemic.

Environmental Clean-up Activities

The Company is involved in environmental clean-up activities in connection with an existing plant location and former waste disposal sites. This includes certain soil and groundwater contamination the Company identified in 1992 at AC Products, Inc. (“ACP”), a wholly owned subsidiary. In voluntary coordination with the Santa Ana California Regional Water Quality Board, ACP has been remediating the contamination. In 2007, ACP agreed to operate two groundwater treatment systems, so as to hydraulically contain groundwater contamination emanating from ACP’s site until such time as the concentrations of contaminants are below the current Federal maximum contaminant level for four consecutive quarterly sampling events. In 2014, ACP ceased operation at one of its two groundwater treatment systems, as it had met the above condition for closure. In 2020, the Santa Ana Regional Water Quality Control Board asked that ACP conduct some additional indoor and outdoor soil vapor testing on and near the ACP site to confirm that ACP continues to meet the applicable local standards and ACP has begun the testing program. Such testing began in 2020 and continued into 2021. As of December 31, 2022, ACP believes it is close to meeting the conditions for closure of the remaining groundwater treatment system but continues to operate this system while in discussions with the relevant authorities.

As of December 31, 2022, the Company believes that the range of potential-known liabilities associated with the balance of ACP water remediation program is approximately \$0.1 million to \$1.0 million. The low and high ends of the range are based on the length of operation of the treatment system as determined by groundwater modeling. Costs of operation include the operation and maintenance of the extraction well, groundwater monitoring, program management, and soil vapor testing.

The Company is also party to environmental matters related to certain domestic and foreign properties. These environmental matters primarily require the Company to perform long-term monitoring as well as operating and maintenance at each of the applicable sites. During the year ended December 31, 2022, there have been no significant changes to the facts or circumstances of these matters, aside from ongoing monitoring and maintenance activities and routine payments associated with each of these sites. The Company continually evaluates its obligations related to such matters, and based on historical costs incurred and projected costs to be incurred over the next 26 years, has estimated the present value range of costs for all of these environmental matters, on a discounted basis, to be between approximately \$5.0 million and \$6.0 million as of December 31, 2022, for which \$5.3 million is accrued within other accrued liabilities and other non-current liabilities on the Company’s Consolidated Balance Sheet as of December 31, 2022. Comparatively, as of December 31, 2021, the Company had \$5.6 million accrued for with respect to these matters.

The Company’s Sao Paulo, Brazil site was required under Brazilian environmental, health and safety regulations to perform an environmental assessment as part of a permit renewal process. Initial investigations identified soil and ground water contamination in select areas of the site. The site has conducted a multi-year soil and groundwater investigation and corresponding risk assessments based on the result of the investigations. In 2017, the site had to submit a new 5-year permit renewal request and was asked to complete additional investigations to further delineate the site based on review of the technical data by the local regulatory agency, Companhia Ambiental do Estado de São Paulo (“CETESB”). Based on review of the updated investigation data, CETESB issued a Technical Opinion regarding the investigation and remedial actions taken to date. The site developed an action plan and submitted it to CETESB in 2018 based on CETESB requirements. The site intervention plan primarily requires the site, among other actions, to conduct periodic monitoring for methane in soil vapors, source zone delineation, groundwater plume delineation, bedrock aquifer assessment, update the human health risk assessment, develop a current site conceptual model and conduct a remedial feasibility study and provide a revised intervention plan. In 2019, the site submitted a report on the activities completed including the revised site conceptual model and results of the remedial feasibility study and recommended remedial strategy for the site. Other environmental matters include participation in certain payments in connection with four currently active environmental consent orders related to certain hazardous waste cleanup activities under the U.S. Federal Superfund statute. The Company has been designated a potentially responsible party (“PRP”) by the Environmental Protection Agency along with other PRPs depending on the site, and has other obligations to perform cleanup activities at certain other foreign subsidiaries. These environmental matters primarily require the Company to perform long-term monitoring as well as operating and maintenance at each of the applicable sites.

The Company believes, although there can be no assurance regarding the outcome of other unrelated environmental matters, that it has made adequate accruals for costs associated with other environmental problems of which it is aware. Approximately \$0.3 million and \$0.4 million were accrued as of December 31, 2022 and 2021, respectively, to provide for such anticipated future environmental assessments and remediation costs.

Notwithstanding the foregoing, the Company cannot be certain that future liabilities in the form of remediation expenses and damages will not exceed amounts reserved. See Note 26 of Notes to Consolidated Financial Statements in Item 8 of this Report

General

See Item 7A of this Report, below, for further discussion of certain quantitative and qualitative disclosures about market risk.

Item 8. Financial Statements and Supplementary Data.

**QUAKER CHEMICAL CORPORATION
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Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Quaker Chemical Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Quaker Chemical Corporation and its subsidiaries (the “Company”) as of December 31, 2022 and 2021, and the related consolidated statements of operations, of comprehensive (loss) income, of changes in equity and of cash flows for each of the three years in the period ended December 31, 2022, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting (not presented herein) appearing under Item 9A of the Company's 2022 Annual Report on Form 10-K. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Goodwill Impairment Assessments for the EMEA Reporting Unit

As described in Note 16 (not presented herein) to the consolidated financial statements appearing under Item 8 of the Company's 2022 Annual Report on Form 10-K, the Company's consolidated goodwill balance was \$515 million as of December 31, 2022, of which \$35 million relates to the EMEA reporting unit. Management completes its annual goodwill impairment test during the fourth quarter of each year, or more frequently if triggering events indicate a possible impairment in one or more of its reporting units. Management monitors various financial, economic and geopolitical conditions impacting the Company and concluded that during the third and fourth quarters of 2022 these events adversely impacted the EMEA reporting unit and represented triggering events. In completing a quantitative goodwill impairment test, management compares the reporting unit's fair value, primarily based on future discounted cash flows, to its carrying value in order to determine if an impairment charge is warranted. The estimates of future discounted cash flows involve considerable management judgment and are based upon certain significant assumptions including the weighted average cost of capital (WACC) as well as projected EBITDA, which includes assumptions related to revenue growth rates, gross margin levels and operating expenses. Management completed its interim impairment assessment in the third quarter and its annual assessment as of October 1, 2022 and concluded no impairment charge was warranted. As a result of the interim impairment assessment performed in the fourth quarter, an impairment charge of \$93 million was recorded to write down the carrying value of the EMEA reporting unit. As discussed in Notes 1 and 4, subsequent to the initial issuance of the December 31, 2022 consolidated financial statements, there was a change in reportable segments. The Company's new structure includes three reportable segments: (i) Americas; (ii) Europe, Middle East and Africa ("EMEA"); and (iii) Asia/Pacific. Prior to this change the Company's historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessments for the EMEA reporting unit is a critical audit matter are (i) the significant judgment by management when developing the fair value estimates of the EMEA reporting unit; (ii) a high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to weighted average cost of capital, revenue growth rates, gross margin levels, and operating expenses; and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment assessments, including controls over the valuation of the Company's EMEA reporting unit. These procedures also included, among others, (i) testing management's process for developing the fair value estimates of the EMEA reporting unit; (ii) evaluating the appropriateness of the discounted cash flow model; (iii) testing the completeness and accuracy of underlying data used in the discounted cash flow model; and (iv) evaluating the reasonableness of management's significant assumptions related to weighted average cost of capital, revenue growth rates, gross margin levels, and operating expenses. Evaluating management's assumptions related to revenue growth rates, gross margin levels, and operating expenses involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the EMEA reporting unit; (ii) the consistency with external market and industry data; and (iii) whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating (i) the appropriateness of the Company's discounted cash flow model and (ii) the reasonableness of the weighted average cost of capital assumption.

/s/PricewaterhouseCoopers, LLP
Philadelphia, Pennsylvania

February 23, 2023, except with respect to our opinion on the consolidated financial statements insofar as it relates to the change in reportable segments discussed in Note 1, as to which the date is August 3, 2023.

We have served as the Company's auditor since at least 1972. We have not been able to determine the specific year we began serving as auditor of the Company.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS
(Dollars in thousands, except per share data)

	Year Ended December 31,		
	2022	2021	2020
Net sales	\$ 1,943,585	\$ 1,761,158	\$ 1,417,677
Cost of goods sold (excluding amortization expense - See Note 16)	1,330,931	1,166,518	904,234
Gross profit	612,654	594,640	513,443
Selling, general and administrative expenses	455,408	418,856	380,752
Impairment charges	93,000	—	38,000
Restructuring and related charges	3,163	1,433	5,541
Combination, integration and other acquisition-related expenses	8,779	23,885	29,790
Operating income	52,304	150,466	59,360
Other (expense) income, net	(12,607)	18,851	(5,618)
Interest expense, net	(32,579)	(22,326)	(26,603)
Income before taxes and equity in net income of associated companies	7,118	146,991	27,139
Taxes on income (loss) before equity in net income of associated companies	24,925	34,939	(5,296)
(Loss) income before equity in net income of associated companies	(17,807)	112,052	32,435
Equity in net income of associated companies	1,965	9,379	7,352
Net (loss) income	(15,842)	121,431	39,787
Less: Net income attributable to noncontrolling interest	89	62	129
Net (loss) income attributable to Quaker Chemical Corporation	\$ (15,931)	\$ 121,369	\$ 39,658
Per share data:			
Net (loss) income attributable to Quaker Chemical Corporation common shareholders – basic	\$ (0.89)	\$ 6.79	\$ 2.23
Net (loss) income attributable to Quaker Chemical Corporation common shareholders – diluted	\$ (0.89)	\$ 6.77	\$ 2.22

The accompanying notes are an integral part of these consolidated financial statements.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE (LOSS) INCOME
(Dollars in thousands)

	Year Ended December 31,		
	2022	2021	2020
Net (loss) income	\$ (15,842)	\$ 121,431	\$ 39,787
Other comprehensive (loss) income, net of tax			
Currency translation adjustments	(82,368)	(46,952)	41,601
Defined benefit retirement plans			
Net gain (loss) arising during the period, other	8,177	9,210	8,827
Amortization of actuarial loss	628	1,078	2,308
Amortization of prior service (gain) cost	(228)	7	(69)
Current period change in fair value of derivatives	1,372	2,226	(3,278)
Unrealized (loss) gain on available-for-sale securities	(1,881)	(2,945)	2,091
Other comprehensive (loss) income	(74,300)	(37,376)	51,480
Comprehensive (loss) income	(90,142)	84,055	91,267
Less: Comprehensive income attributable to noncontrolling interest	(39)	(78)	(37)
Comprehensive (loss) income attributable to Quaker Chemical Corporation	\$ (90,181)	\$ 83,977	\$ 91,230

The accompanying notes are an integral part of these consolidated financial statements.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED BALANCE SHEETS
(Dollars in thousands, except par value)

	December 31,	
	2022	2021
ASSETS		
Current assets		
Cash and cash equivalents	\$ 180,963	\$ 165,176
Accounts receivable, net	472,888	430,676
Inventories, net	284,848	264,531
Prepaid expenses and other current assets	55,438	59,871
Total current assets	<u>994,137</u>	<u>920,254</u>
Property, plant and equipment, net	198,595	197,520
Right of use lease assets	43,766	36,635
Goodwill	515,008	631,194
Other intangible assets, net	942,925	1,027,782
Investments in associated companies	88,234	95,278
Deferred tax assets	11,218	16,138
Other non-current assets	27,739	30,959
Total assets	<u>\$ 2,821,622</u>	<u>\$ 2,955,760</u>
LIABILITIES AND EQUITY		
Current liabilities		
Short-term borrowings and current portion of long-term debt	\$ 19,245	\$ 56,935
Accounts payable	193,983	226,656
Dividends payable	7,808	7,427
Accrued compensation	39,834	38,197
Accrued restructuring	5,483	4,087
Accrued pension and postretirement benefits	1,560	1,548
Other accrued liabilities	86,873	95,617
Total current liabilities	<u>354,786</u>	<u>430,467</u>
Long-term debt	933,561	836,412
Long-term lease liabilities	26,967	26,335
Deferred tax liabilities	160,294	179,025
Non-current accrued pension and postretirement benefits	28,765	45,984
Other non-current liabilities	38,664	49,615
Total liabilities	<u>1,543,037</u>	<u>1,567,838</u>
Commitments and contingencies (Note 26)		
Equity		
Common stock, \$1 par value; authorized 30,000,000 shares; issued and outstanding 2022 – 17,950,264 shares; 2021 – 17,897,033 shares	17,950	17,897
Capital in excess of par value	928,288	917,053
Retained earnings	469,920	516,334
Accumulated other comprehensive loss	(138,240)	(63,990)
Total Quaker shareholders' equity	<u>1,277,918</u>	<u>1,387,294</u>
Noncontrolling interest	667	628
Total equity	<u>1,278,585</u>	<u>1,387,922</u>
Total liabilities and equity	<u>\$ 2,821,622</u>	<u>\$ 2,955,760</u>

The accompanying notes are an integral part of these consolidated financial statements.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Dollars in thousands)

	Year Ended December 31,		
	2022	2021	2020
Cash flows from operating activities			
Net (loss) income	\$ (15,842)	\$ 121,431	\$ 39,787
Adjustments to reconcile net income to net cash provided by operating activities:			
Amortization of debt issuance costs	2,942	4,749	4,749
Depreciation and amortization	80,467	86,550	83,246
Equity in undistributed earnings of associated companies, net of dividends	1,005	(8,971)	4,862
Acquisition-related fair value adjustments related to inventory	—	801	229
Deferred income taxes	(10,552)	(12,506)	(38,281)
Uncertain tax positions (non-deferred portion)	(6,398)	(922)	1,075
Deferred compensation and other, net	2,613	(5,325)	(471)
Share-based compensation	11,666	11,038	10,996
Loss on extinguishment of debt	5,246	—	—
(Gain) loss on disposal of property, plant, equipment and other assets	(168)	(4,695)	871
Insurance settlement realized	—	—	(1,035)
Impairment charges	93,000	—	38,000
Gain on inactive subsidiary litigation and settlement reserve	—	—	(18,144)
Combination and other acquisition-related expenses, net of payments	(4,460)	(1,974)	860
Restructuring and related charges	3,163	1,433	5,541
Pension and other postretirement benefits	(7,964)	(6,330)	16,535
(Decrease) increase in cash from changes in current assets and current liabilities, net of acquisitions:			
Accounts receivable	(59,112)	(67,473)	17,170
Inventories	(29,858)	(84,428)	(3,854)
Prepaid expenses and other current assets	3,705	(21,174)	927
Change in restructuring liabilities	(1,532)	(5,266)	(15,745)
Accounts payable and accrued liabilities	(23,439)	37,998	22,308
Estimated taxes on (loss) income	(2,688)	3,997	8,763
Net cash provided by operating activities	41,794	48,933	178,389
Cash flows from investing activities			
Investments in property, plant and equipment	(28,539)	(21,457)	(17,901)
Payments related to acquisitions, net of cash acquired	(13,115)	(42,417)	(56,230)
Proceeds from disposition of assets	1,463	14,744	2,702
Insurance settlement interest earned	—	—	44
Net cash used in investing activities	(40,191)	(49,130)	(71,385)
Cash flows from financing activities			
Payments of long-term debt	(673,203)	(38,011)	(37,615)
Proceeds from long-term debt	750,000	—	—
(Repayments) borrowings on revolving credit facilities, net	(16,281)	53,031	(11,485)
Repayments on other debt, net	(1,629)	(776)	(661)
Financing-related debt issuance costs	(3,734)	—	—
Dividends paid	(30,103)	(28,599)	(27,563)
Stock options exercised, other	(378)	890	3,867
Purchase of noncontrolling interest in affiliates	—	—	(1,047)
Distributions to noncontrolling affiliate shareholders	—	—	(751)
Net cash provided by (used in) financing activities	24,672	(13,465)	(75,255)
Effect of foreign exchange rate changes on cash	(10,488)	(3,057)	6,591
Net increase (decrease) in cash, cash equivalents and restricted cash	15,787	(16,719)	38,340
Cash, cash equivalents and restricted cash at the beginning of the period	165,176	181,895	143,555
Cash, cash equivalents and restricted cash at the end of the period	\$ 180,963	\$ 165,176	\$ 181,895
Supplemental cash flow disclosures:			
Cash paid during the year for:			
Income taxes, net of refunds	\$ 35,327	\$ 34,775	\$ 20,253
Interest	29,074	19,298	23,653
Non-cash activities:			
Change in accrued purchases of property, plant and equipment, net	\$ 278	\$ 2,132	\$ (1,376)

The accompanying notes are an integral part of these consolidated financial statements.

QUAKER CHEMICAL CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY
(Dollars in thousands, except per share amounts)

	Common stock	Capital in excess of par value	Retained earnings	Accumulated other comprehensive loss	Noncontrolling interest	Total
Balance as of December 31, 2019	\$ 17,735	\$ 888,218	\$ 412,979	\$ (78,170)	\$ 1,604	\$1,242,366
Cumulative effect of an accounting change	—	—	(911)	—	—	(911)
Balance as of January 1, 2020	17,735	888,218	412,068	(78,170)	1,604	1,241,455
Net income	—	—	39,658	—	129	39,787
Amounts reported in other comprehensive income (loss)	—	—	—	51,572	(92)	51,480
Dividends declared (\$1.56 per share)	—	—	(27,786)	—	—	(27,786)
Acquisition of noncontrolling interest	—	(707)	—	—	(340)	(1,047)
Distributions to noncontrolling affiliate shareholders	—	—	—	—	(751)	(751)
Shares issued upon exercise of stock options and other	66	6,714	—	—	—	6,780
Share-based compensation plans	50	10,946	—	—	—	10,996
Balance as of December 31, 2020	17,851	905,171	423,940	(26,598)	550	1,320,914
Net income	—	—	121,369	—	62	121,431
Amounts reported in other comprehensive (loss) income	—	—	—	(37,392)	16	(37,376)
Dividends declared (\$1.62 per share)	—	—	(28,975)	—	—	(28,975)
Shares issued upon exercise of stock options and other	17	1,677	—	—	—	1,694
Share-based compensation plans	29	10,205	—	—	—	10,234
Balance as of December 31, 2021	17,897	917,053	516,334	(63,990)	628	1,387,922
Net (loss) income	—	—	(15,931)	—	89	(15,842)
Amounts reported in other comprehensive (loss) income	—	—	—	(74,250)	(50)	(74,300)
Dividends declared (\$1.70 per share)	—	—	(30,483)	—	—	(30,483)
Shares issued upon exercise of stock options and other	1	(355)	—	—	—	(354)
Share-based compensation plans	52	11,590	—	—	—	11,642
Balance as of December 31, 2022	<u>\$ 17,950</u>	<u>\$ 928,288</u>	<u>\$ 469,920</u>	<u>\$ (138,240)</u>	<u>\$ 667</u>	<u>\$1,278,585</u>

The accompanying notes are an integral part of these consolidated financial statements.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
(Dollars in thousands, except per share amounts, unless otherwise stated)

Note 1 – Significant Accounting Policies

As used in these Notes to Consolidated Financial Statements, the terms “Quaker,” “Quaker Houghton,” the “Company,” “we,” and “our” refer to Quaker Chemical Corporation (doing business as Quaker Houghton), its subsidiaries, and associated companies, unless the context otherwise requires. The “Combination” refers to the Quaker combination with Houghton International, Inc. (“Houghton”).

Segments: The Company’s operating segments, which are consistent with its reportable segments, reflect the structure of the Company’s internal organization, the method by which the Company’s resources are allocated and the manner by which the chief operating decision maker assesses the Company’s performance.

During the first quarter of 2023, the Company reorganized its executive management team to align with its new business structure. The Company’s new structure includes three reportable segments: (i) Americas; (ii) Europe, Middle East and Africa (“EMEA”); and (iii) Asia/Pacific. Prior to the Company’s reorganization, the Company’s historical reportable segments were: (i) Americas; (ii) EMEA; (iii) Asia/Pacific; and (iv) Global Specialty Businesses. Prior period segment financial information has been recast to align with segment change, including reportable segments and customer industry disaggregation. See Notes 2, 4, 5, and 16 of Notes to Consolidated Financial Statements.

Principles of consolidation: All majority-owned subsidiaries are included in the Company’s consolidated financial statements, with appropriate elimination of intercompany balances and transactions. Investments in associated companies (less than majority-owned and in which the Company has significant influence) are accounted for under the equity method. The Company’s share of net income or losses in these investments in associated companies is included in the Consolidated Statements of Operations. The Company periodically reviews these investments for impairments and, if necessary, would adjust these investments to their fair value when a decline in market value or other impairment indicators are deemed to be other than temporary. See Note 17 of Notes to Consolidated Financial Statements. The Company is not the primary beneficiary of any variable interest entities (“VIEs”) and therefore the Company’s consolidated financial statements do not include the accounts of any VIEs.

Translation of foreign currency: Assets and liabilities of non-U.S. subsidiaries and associated companies are translated into U.S. dollars at the respective rates of exchange prevailing at the end of the year. Income and expense accounts are translated at average exchange rates prevailing during the year. Translation adjustments resulting from this process are recorded directly in equity as accumulated other comprehensive (loss) income (“AOCI”) and will be included as income or expense only upon sale or liquidation of the underlying entity or asset. Generally, all of the Company’s non-U.S. subsidiaries use their local currency as their functional currency.

Cash and cash equivalents: The Company invests temporary and excess funds in money market securities and financial instruments having maturities within 90 days. The Company considers all highly liquid investments with original maturities of three months or less to be cash equivalents. The Company has not experienced losses from the aforementioned investments.

Accounts receivable and allowance for credit losses: Trade accounts receivable subject the Company to credit risk. Trade accounts receivable are recorded at the invoiced amount and generally do not bear interest. The Company recognizes an allowance for credit losses, which represents the portion of the receivable that the Company does not expect to collect over its contractual life, considering past events and reasonable and supportable forecasts of future economic conditions. The Company’s allowance for credit losses on its trade accounts receivable is based on specific collectability facts and circumstances for each outstanding receivable and customer, the aging of outstanding receivables, and the associated collection risk the Company estimates for certain past due aging categories, and also, the general risk to all outstanding accounts receivable based on historical amounts determined to be uncollectible. The Company does not have any off-balance-sheet credit exposure related to its customers. See Note 13 of Notes to Consolidated Financial Statements.

Inventories: Inventories are valued at the lower of cost or net realizable value, and are valued using the first-in, first-out method. See Note 14 of Notes to Consolidated Financial Statements.

Right of use lease assets and lease liabilities: The Company determines if an arrangement is a lease at its inception. This determination generally depends on whether the arrangement conveys the right to control the use of an identified fixed asset explicitly or implicitly for a period of time in exchange for consideration. Control of an underlying asset is conveyed if the Company obtains the rights to direct the use of, and obtains substantially all of the economic benefits from the use of, the underlying asset. Lease expense for variable leases and short-term leases is recognized when the obligation is incurred.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The lease term for all of the Company's leases includes the non-cancellable period of the lease plus any additional periods covered by an option to extend the lease that the Company is reasonably certain it will exercise. Operating leases are included in right of use lease assets, other accrued liabilities and long-term lease liabilities on the Consolidated Balance Sheet. Right of use lease assets and liabilities are recognized at each lease's commencement date based on the present value of its lease payments over its respective lease term. Operating lease expense is recognized on a straight-line basis over the lease term.

The Company uses the stated borrowing rate for a lease when readily determinable. When a stated borrowing rate is not available in a lease agreement, the Company uses its incremental borrowing rate based on information available at the lease's commencement date to determine the present value of its lease payments. In determining the incremental borrowing rate used to present value each of its leases, the Company considers certain information including fully secured borrowing rates readily available to the Company and its subsidiaries. The Company includes finance leases in Property, plant and equipment ("PP&E"), current portion of long-term debt and long-term debt on the Consolidated Balance Sheet.

Long-lived assets: PP&E is stated at gross cost, less accumulated depreciation. Depreciation is computed using the straight-line method on an individual asset basis over the following estimated useful lives: buildings and improvements, 10 to 33 years, or the remaining term of the lease; and machinery and equipment, 4 to 10 years, or the remaining term of the lease. The carrying values of long-lived assets are evaluated whenever changes in circumstances or current events indicate the carrying amount of such assets may not be recoverable. An estimate of undiscounted cash flows produced by the asset, or the appropriate group of assets, is compared with the carrying value to determine whether an impairment exists. If necessary, the Company recognizes an impairment loss for the difference between the carrying amount of the assets and their estimated fair value. Fair value is based on current and anticipated future cash flows. Upon sale or other dispositions of long-lived assets, the applicable amounts of asset cost and accumulated depreciation are removed from the accounts and the net amount, less proceeds from disposals, is recorded in the Consolidated Statements of Operations. Expenditures for renewals or improvements that increase the estimated useful life or capacity of the assets are capitalized, whereas expenditures for repairs and maintenance are expensed when incurred. See Notes 9 and 15 of Notes to Consolidated Financial Statements.

Capitalized software: The Company capitalizes certain costs in connection with developing or obtaining software for internal use, depending on the associated project. These costs are amortized over a period of 3 to 5 years once the assets are ready for their intended use. In connection with the implementations and upgrades to the Company's global transaction, consolidation and other related systems, approximately \$3.5 million and \$3.6 million of net costs were capitalized in PP&E on the Company's Consolidated Balance Sheets at December 31, 2022 and 2021, respectively.

Goodwill and other intangible assets: The Company records goodwill, definite-lived intangible assets and indefinite-lived intangible assets at fair value at the date of acquisition. Goodwill and indefinite-lived intangible assets are not amortized but tested for impairment at least annually. These tests will be performed more frequently if triggering events indicate potential impairment. Definite-lived intangible assets are amortized on a straight-line basis over their estimated useful lives, generally for periods ranging from 3 to 24 years. The Company continually evaluates the reasonableness of the useful lives of these assets, consistent with the discussion of long-lived assets, above. See Note 16 of Notes to Consolidated Financial Statements.

Revenue recognition: The Company recognizes revenue in an amount that reflects the consideration to which the Company expects to be entitled in exchange for goods or services transferred to its customers. To do this, the Company applies a five-step model, which requires the Company to: (i) identify the contract with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when, or as, the Company satisfies a performance obligation.

The Company identifies a contract with a customer when a sales agreement indicates approval and commitment of the parties; identifies the rights of the parties; identifies the payment terms; has commercial substance; and it is probable that the Company will collect the consideration to which it will be entitled in exchange for the goods or services that will be transferred to the customer.

The Company identifies a performance obligation in a contract for each promised good or service that is separately identifiable from other obligations in the contract and for which the customer can benefit from the good or service either on its own or together with other resources that are readily available to the customer. The Company determines the transaction price as the amount of consideration it expects to be entitled to in exchange for fulfilling the performance obligations, including the effects of any variable consideration, significant financing elements, amounts payable to the customer or noncash consideration. For any contracts that have more than one performance obligation, the Company allocates the transaction price to each performance obligation in an amount that depicts the amount of consideration to which the Company expects to be entitled in exchange for satisfying each performance obligation.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

In accordance with the last step of the five-step model, the Company recognizes revenue when, or as, it satisfies the performance obligation in a contract by transferring control of a promised good or providing the service to the customer. The Company typically satisfies its performance obligations and recognizes revenue at a point in time for product sales, generally when products are shipped or delivered to the customer, depending on the terms underlying each arrangement. In circumstances where the Company's products are on consignment, revenue is generally recognized upon usage or consumption by the customer. For any Fluidcare™ or other services provided by the Company to the customer, the Company typically satisfies its performance obligations and recognizes revenue over time, as the promised services are performed. The Company uses input methods to recognize revenue over time related to these services, including labor costs and time incurred. The Company believes that these input methods represent the most indicative measure of the Fluidcare™ or other service work performed by the Company.

The Company does not have standard payment terms for all customers, however the Company's general payment terms require customers to pay for products or services provided after the performance obligation is satisfied. The Company does not have significant financing arrangements with its customers. Therefore, the Company does not adjust the promised amount of consideration for the effects of a significant financing component as the Company expects, at contract inception, that the period between when the Company transfers a promised good or service to the customer and when the customer pays for that good or service will be one year or less.

In addition, the Company expenses costs to obtain a contract as incurred when the expected period of benefit, and therefore the amortization period, is one year or less. In addition, the Company excludes from the measurement of the transaction price all taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction and collected by the entity from a customer, including sales, use, value added, excise and various other taxes. Lastly, the Company has elected to account for shipping and handling activities that occur after the customer has obtained control of a good as a fulfillment cost, rather than an additional promised service. The Company does not have significant amounts of variable consideration in its contracts with customers and where applicable, the Company's estimates of variable consideration are not constrained.

The Company records certain third-party license fees in other income (expense), net, in its Consolidated Statement of Operations, which generally include sales-based royalties in exchange for the license of intellectual property. These license fees are recognized in accordance with their agreed-upon terms and when performance obligations are satisfied, which is generally when the third party has a subsequent sale.

The Company recognizes a contract asset or receivable on its Consolidated Balance Sheet when the Company performs a service or transfers a good in advance of receiving consideration. A receivable is the Company's right to consideration that is unconditional and only the passage of time is required before payment of that consideration is due. A contract asset is the Company's right to consideration in exchange for goods or services that the Company has transferred to a customer.

A contract liability is recognized when the Company receives consideration, or if it has the unconditional right to receive consideration, in advance of performance. A contract liability is the Company's obligation to transfer goods or services to a customer for which the Company has received consideration, or a specified amount of consideration is due, from the customer.

See Note 5 of Notes to Consolidated Financial Statements.

Research and development costs: Research and development costs are expensed as incurred and are included in selling, general and administrative expenses ("SG&A"). Research and development expenses were \$46.0 million, \$44.9 million and \$40.0 million for the years ended December 31, 2022, 2021 and 2020, respectively.

Environmental liabilities and expenditures: Accruals for environmental matters are recorded when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated. If there is a range of estimated liability and no amount in that range is considered more probable than another, then the Company records the lowest amount in the range. Environmental costs and remediation costs are capitalized if the costs extend the life, increase the capacity or improve safety or efficiency of the property from the date acquired or constructed, and/or mitigate or prevent contamination in the future. See Note 26 of Notes to Consolidated Financial Statements.

Asset retirement obligations: The Company assesses whether it has legal or conditional obligations associated with the retirement of tangible long-lived assets that result from the acquisition, construction, or development and/or the normal operation of a long-lived asset, including any legal obligations that require disposal of a replaced part that is a component of a tangible long-lived asset. As of December 31, 2022 and 2021, the Company had no significant exposure or liabilities recorded on its Consolidated Balance Sheets.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Pension and other postretirement benefits: The Company maintains various noncontributory retirement plans, covering a portion of its employees in the U.S. and certain other countries, including the Netherlands, the United Kingdom (“U.K.”), Mexico, Sweden, Germany and France. The plans of the remaining non-U.S. subsidiaries are, for the most part, either fully insured or integrated with the local governments’ plans. The Company recognizes on a prospective basis the funded status of the defined benefit pension and other postretirement plans on its Consolidated Balance Sheets and, also, recognize as a component of AOCI, net of tax, the gains or losses and prior service costs or credits that arise during the period but are not recognized as components of net periodic benefit cost. In addition, the Company recognizes a settlement charge in its Consolidated Statements of Operations when certain events occur, including plan termination or the settlement of certain plan liabilities. A settlement charge represents the immediate recognition into expense of a portion of the unrecognized loss within AOCI on the balance sheet in proportion to the share of the projected benefit obligation that was settled. The measurement date for the Company’s postretirement benefits plan is December 31.

The Company’s global pension investment policies are designed to ensure that pension assets are invested in a manner consistent with meeting the future benefit obligations of the pension plans and maintaining compliance with various laws and regulations including the Employee Retirement Income Security Act of 1974. The Company establishes strategic asset allocation percentage targets and benchmarks for significant asset classes with the aim of achieving a prudent balance between return and risk. The Company’s investment horizon is generally long term, and, accordingly, the target asset allocations encompass a long-term perspective of capital markets, expected risk and return and perceived future economic conditions while also considering the profile of plan liabilities. To the extent feasible, the short-term investment portfolio is managed to match the short-term obligations, the intermediate portfolio duration is matched to reduce the risk of volatility in intermediate plan distributions, and the total return portfolio is managed to maximize the long-term real growth of plan assets. The critical investment principles of diversification, assessment of risk and targeting the optimal expected returns for given levels of risk are applied. The Company’s investment guidelines prohibit the use of securities such as letter stock and other unregistered securities, commodities or commodity contracts, short sales, margin transactions, private placements (unless specifically addressed by addendum), or any derivatives, options or futures for the purpose of portfolio leveraging.

The target asset allocation is reviewed periodically and is determined based on a long-term projection of capital market outcomes, inflation rates, fixed income yields, returns, volatilities and correlation relationships. The interaction between plan assets and benefit obligations is periodically studied to assist in establishing such strategic asset allocation targets. Asset performance is monitored with an overall expectation that plan assets will meet or exceed benchmark performance over rolling five year periods. The Company’s pension committee, as authorized by the Company’s Board of Directors (the “Board”), has discretion to manage the assets within established asset allocation ranges approved by senior management of the Company. See Note 21 of Notes to Consolidated Financial Statements.

Comprehensive income (loss): The Company presents Other comprehensive (loss) income in its Statements of Comprehensive (Loss) Income. The Company discloses significant amounts reclassified from each component of AOCI, the related tax amounts and the income statement line items affected by such reclassifications. See Note 23 of Notes to Consolidated Financial Statements.

Income taxes and uncertain tax positions: The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. The provision for income taxes represents income taxes paid or payable for the current year and the change in deferred taxes during the year. Deferred taxes result from differences between the financial and tax bases of the Company’s assets and liabilities and are adjusted for changes in tax rates and tax laws when changes are enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized. The Company accounts for uncertainty in income taxes by applying the recognition threshold and measurement attributes for financial statement recognition and measurement of tax positions taken or expected to be taken on a tax return. The Company determines whether the benefits of tax positions are probable or more likely than not sustained upon audit based upon the technical merits of the tax position. For tax positions that are determined to be more likely than not sustained upon audit, the Company recognizes the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement in the financial statements. For tax positions that are not determined to be more likely than not sustained upon audit, the Company does not recognize any portion of the benefit in the financial statements. Additionally, the Company monitors and adjusts for derecognition, classification, and penalties and interest in interim periods, with appropriate disclosure and transition thereto. Also, the amount of interest expense and income related to uncertain tax positions is computed by applying the applicable statutory rate of interest to the difference between the tax position recognized, including timing differences, and the amount previously taken or expected to be taken in a tax return. The Company recognizes interest and/or penalties related to income tax matters in income tax expense. Finally, when applicable, the Company nets its liability for unrecognized tax benefits against deferred tax assets related to net operating losses or other tax credit carryforwards that would apply if the uncertain tax position were settled for the presumed amount at the balance sheet date.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Pursuant to the Tax Cuts and Jobs Act (“U.S. Tax Reform”), specifically the one-time tax on deemed repatriation (the “Transition Tax”), the Company has provided for U.S. income tax on its undistributed earnings of non-U.S. subsidiaries, however, the Company is subject to and will incur other taxes, such as withholding taxes and dividend distribution taxes, if these undistributed earnings were ultimately remitted to the U.S. The Company currently intends to reinvest its future undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives of those subsidiaries. However, in certain cases the Company has and may in the future change its indefinite reinvestment assertion for any or all of these undistributed earnings. In this case, the Company would estimate and record a tax liability and corresponding tax expense for the amount of non-U.S. income taxes it would incur to ultimately remit these earnings to the U.S. See Note 10 of Notes to Consolidated Financial Statements.

Derivatives: The Company is exposed to the impact of changes in interest rates, foreign currency fluctuations, changes in commodity prices and credit risk. Historically, the Company has utilized interest rate swap agreements to enhance its ability to manage risk, including exposure to variability in interest payments associated with its variable rate debt. Derivative instruments are entered into for periods consistent with the related underlying exposures and do not constitute positions independent of those exposures. In October 2022, the Company’s interest rate swap contracts expired. As of December 31, 2022, the Company has not entered into any similar interest rate swap contracts. The Company previously recorded these instruments on a net basis within the Consolidated Balance Sheets. The effective portion of the change in fair value of the agreement was recorded in AOCI and was recognized in the Consolidated Statements of Operations when cash was paid from the counterparties. See Note 25 of Notes to Consolidated Financial Statements.

Fair value measurements: The Company utilizes a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. See Notes 21 and 24 of Notes to Consolidated Financial Statements. The following is a brief description of those three levels:

- Level 1: Observable inputs such as quoted prices (unadjusted) in active markets for identical assets or liabilities.
- Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.
- Level 3: Unobservable inputs that reflect the reporting entity's own assumptions.

Share-based compensation: The Company recognizes the fair value of share-based compensation as a component of expense. The Company has a long-term incentive program (“LTIP”) for key employees which provides for the granting of options to purchase stock at prices not less than its market value on the date of the grant. Most options become exercisable within three years after the date of the grant for a period of time determined by the Company, but not to exceed seven years from the date of grant. Restricted stock awards and restricted stock units issued under the LTIP program are subject to time vesting generally over a one to three year period. In addition, as part of the Company’s Annual Incentive Plan, nonvested shares may be issued to key employees, which generally would vest over a two to five year period.

In addition, while the Company is permitted to make an accounting policy election to account for forfeitures as they occur for service condition aspects of certain share-based awards, the Company has decided not to elect this accounting policy and instead has elected to continue utilizing a forfeiture rate assumption. Based on historical experience, the Company generally has assumed a forfeiture rate of 13% on certain of its nonvested stock awards. The Company will record additional expense if the actual forfeiture rate is lower than estimated and will record a recovery of prior expense if the actual forfeiture is higher than estimated.

The Company also issues performance-dependent stock awards as a component of its LTIP. The fair value of the performance-dependent stock awards is based on their grant-date market value adjusted for the likelihood of attaining certain predetermined performance goals and is calculated by utilizing a Monte Carlo simulation model. Compensation expense is recognized on a straight-line basis over the vesting period, generally three years.

See Note 8 of the Notes to Consolidated Financial Statements.

Earnings per share: The Company calculates earnings per share for nonvested stock awards with rights to non-forfeitable dividends, which requires nonvested stock awards with rights to non-forfeitable dividends to be included as part of the basic weighted average share calculation under the two-class method. See Note 11 of Notes to Consolidated Financial Statements.

Hyper-inflationary accounting: Economies that have a cumulative three year rate of inflation exceeding 100% are considered hyper-inflationary. A legal entity that operates within an economy deemed to be hyper-inflationary is required to remeasure its monetary assets and liabilities to the applicable published exchange rates and record the associated gains or losses resulting from the remeasurement directly to the Consolidated Statements of Operations.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Argentina's and Türkiye's economies were considered hyper-inflationary effective July 1, 2018 and April 1, 2022, respectively. As of, and for the year ended December 31, 2022, the Company's Argentine and Turkish subsidiaries represented a combined 1% and 2% of the Company's consolidated total assets and net sales, respectively. For the years ended December 31, 2022, 2021 and 2020, the Company recorded \$1.6 million, \$0.6 million, and \$0.4 million, respectively, of remeasurement losses associated with the applicable currency conversions related to Argentina and Türkiye. These losses were recorded within foreign exchange losses, net, which is a component of Other (expense) income, net, in the Company's Consolidated Statements of Operations.

Business combinations: The Company accounts for business combinations under the acquisition method of accounting. This method requires the recording of acquired assets, including separately identifiable intangible assets, and assumed liabilities at their respective acquisition date estimated fair values. Any excess of the purchase price over the estimated fair value of the identifiable net assets acquired is recorded as goodwill. The determination of the estimated fair value of assets acquired and liabilities assumed requires significant estimates and assumptions. Based on the assessment of additional information during the measurement period, which may be up to one year from the acquisition date, the Company may record adjustments to the estimated fair value of assets acquired and liabilities assumed. See Note 2 of Notes to Consolidated Financial Statements.

Restructuring activities: Restructuring programs consist of employee severance, rationalization of manufacturing or other facilities and other related items. To account for such programs, the Company recognizes a liability for a cost associated with an exit or disposal activity, when the liability is incurred, is estimable, and payment is probable. See Note 7 of Notes to Consolidated Financial Statements.

Reclassifications: Certain information has been reclassified to conform to the current year presentation.

Accounting estimates: The preparation of financial statements in conformity with generally accepted accounting principles in the United States ("U.S. GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and disclosure of contingencies at the date of the financial statements and the reported amounts of net sales and expenses during the reporting period. Actual results could differ from such estimates.

Note 2 – Business Combinations

2022 Acquisitions

In October 2022, the Company acquired a business that provides pickling and rinsing products and services, which is part of the EMEA reportable segment, for approximately 3.5 million EUR or approximately \$3.5 million. This acquisition, along with the Company's January 2022 acquisition in the Americas reportable segment (described below), which had similar specializations and product offerings, strengthens Quaker Houghton's position in pickling inhibitors and additives, enabling the Company to better support and optimize production processes for customers across the Metals industry. The Company allocated \$2.8 million of the purchase price to intangible assets, comprised of \$2.3 million of customer relationships to be amortized over 10 years; \$0.2 million of existing product technologies to be amortized over 10 years; and \$0.3 million of licensed trademarks to be amortized over 10 years. In addition, the Company recorded \$0.8 million of goodwill related to expected value not allocated to other acquired assets.

In January 2022, the Company acquired a business that provides pickling inhibitor technologies, drawing lubricants and stamping oil, and various other lubrication, rust preventative, and cleaner applications, which is part of the Americas reportable segment for approximately \$8.0 million. This business broadens the Company's product offerings within its existing metals and metalworking business in the Americas region. The Company allocated \$5.6 million of the purchase price to intangible assets, comprised of \$5.1 million of customer relationships to be amortized over 14 years; and \$0.5 million of existing product technologies to be amortized over 14 years. In addition, the Company recorded \$1.8 million of goodwill related to expected value not allocated to other acquired assets, all of which is expected to be tax deductible in various jurisdictions in which the Company operates. During the third quarter of 2022 the Company finalized post-closing adjustments that resulted in the Company paying less than \$0.1 million of additional purchase consideration. Factors contributing to the purchase price that resulted in goodwill included the acquisition of business processes and personnel that will allow Quaker Houghton to better serve its customers.

In January 2022, the Company acquired a business related to the sealing and impregnation of metal castings for the automotive sector, as well as impregnation resin and impregnation systems for metal parts in Europe for approximately 1.2 million EUR or approximately \$1.4 million. This business broadens its product offerings and service capabilities within its existing impregnation business.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Other Previous Acquisitions

In November 2021, the Company acquired Baron Industries (“Baron”), a privately held company that provides vacuum impregnation services of castings, powder metals and electrical components in the United States for \$11.0 million, including an initial cash payment of \$7.1 million, subject to post-closing adjustments as well as certain earn-out provisions that are payable at various times from 2022 through 2025. The earn-out provisions could total a maximum of \$4.5 million. In September 2022, the Company paid \$2.5 million related to certain of these earnout provisions. The Company recorded an incremental earn-out expense of \$0.1 million during the year ended December 31, 2022 related to these earnout provisions, recorded within the financial statement caption “Combination, integration and other acquisition-related expenses” on the Company’s Condensed Consolidated Statements of Operations. As of December 31, 2022, the Company has remaining earnout liabilities recorded on its Condensed Consolidated Balance Sheet of \$1.6 million. The Company allocated \$8.0 million of the purchase price to intangible assets, \$1.1 million of property, plant and equipment and \$1.5 million of other assets acquired net of liabilities assumed, which includes \$0.3 million of cash acquired. In addition, the Company recorded \$0.4 million of goodwill, none of which is expected to be tax deductible. Intangible assets comprised \$7.2 million of customer relationships to be amortized over 15 years; and \$0.8 million of existing product technology to be amortized over 13 years. Factors contributing to the purchase price that resulted in goodwill included the acquisition of business processes and personnel that will allow Quaker Houghton to better serve its customers. During the third quarter of 2022 the Company finalized post-closing adjustments that resulted in the Company receiving less than \$0.1 million.

In November 2021, the Company acquired a business that provides hydraulic fluids, coolants, cleaners, and rust preventative oils in Türkiye for its EMEA reportable segment for 3.2 million EUR or approximately \$3.7 million.

In September 2021, the Company acquired the remaining interest in Grindaix-GmbH (“Grindaix”), a Germany-based, high-tech provider of coolant control and delivery systems for its EMEA reportable segment for 2.4 million EUR or approximately \$2.9 million, which is gross of approximately \$0.3 million of cash acquired. Previously, in February 2021, the Company acquired a 38% ownership interest in Grindaix for 1.4 million EUR or approximately \$1.7 million. The Company recorded its initial investment as an equity method investment within the Consolidated Financial Statements and accounted for the purchase of the remaining interest as a step acquisition whereby the Company remeasured the previously held equity method investment to its fair value.

In June 2021, the Company acquired certain assets for its chemical milling maskants product line in Europe for 2.3 million EUR or approximately \$2.8 million.

In February 2021, the Company acquired a tin-plating solutions business for the steel end market for \$25.0 million. This acquisition is part of each of the Company’s reportable segments. The Company allocated \$19.6 million of the purchase price to intangible assets, comprised of \$18.3 million of customer relationships, to be amortized over 19 years; \$0.9 million of existing product technology to be amortized over 14 years; and \$0.4 million of a licensed trademark to be amortized over 3 years. In addition, the Company recorded \$5.0 million of goodwill, all of which is expected to be tax deductible in various jurisdictions in which we operate. Factors contributing to the purchase price that resulted in goodwill included the acquisition of business processes and personnel that will allow Quaker Houghton to better serve its customers.

In December 2020, the Company completed its acquisition of Coral Chemical Company (“Coral”), a privately held, U.S.-based provider of metal finishing fluid solutions. The acquisition provides technical expertise and product solutions for pre-treatment, metalworking and wastewater treatment applications to the beverage cans and general industrial end markets. The original purchase price was approximately \$54.1 million, subject to routine and customary post-closing adjustments related to working capital and net indebtedness levels. Subsequent to the acquisition, the Company and the sellers of Coral (the “Sellers”) have worked to finalize certain post-closing adjustments. During the second quarter of 2022, after failing to reach resolution, the Sellers filed suit asserting certain amounts owed related to tax attributes of the acquisition. Since the second quarter of 2022, there have been no material changes to the facts and circumstances of the claim asserted by the Sellers, and the Company continues to believe the potential range of exposure for this claim is \$0 to \$1.5 million.

In May 2020, the Company acquired Tel Nordic ApS (“TEL”), a company that specializes in lubricants and engineering primarily in high pressure aluminum die casting for its EMEA reportable segment. Consideration paid was in the form of a convertible promissory note in the amount of 20.0 million DKK, or approximately \$2.9 million, which was subsequently converted into shares of the Company’s common stock. An adjustment to the purchase price of approximately 0.4 million DKK, or less than \$0.1 million, was made as a result of finalizing a post-closing settlement in the second quarter of 2020. The Company allocated approximately \$2.4 million of the purchase price to intangible assets to be amortized over 17 years. In addition, the Company recorded approximately \$0.5 million of goodwill, related to expected value not allocated to other acquired assets, none of which will be tax deductible.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

In March 2020, the Company acquired the remaining 49% ownership interest in one of its South African affiliates, Quaker Chemical South Africa Limited (“QSA”) for 16.7 million ZAR, or approximately \$1.0 million, from its joint venture partner PQ Holdings South Africa. QSA is a part of the Company’s EMEA reportable segment. As this acquisition was a change in an existing controlling ownership, the Company recorded \$0.7 million of excess purchase price over the carrying value of the noncontrolling interest in Capital in excess of par value.

During the first quarter of 2020, the Company finalized its post-closing adjustments for the Norman Hay plc (“Norman Hay”) acquisition and paid approximately 2.5 million GBP to settle post-closing adjustments.

As of December 31, 2022, the allocation of the purchase price of each of the 2022 acquisitions has not been finalized and the one year measurement period has not ended for any of these acquisitions. Further adjustments may be necessary as a result of the Company’s on-going assessment of additional information related to the fair value of assets acquired and liabilities assumed. As of December 31, 2022, the allocation of the purchase price for all other previous acquisitions was finalized and the one year measurement period ended.

The results of operations of each acquisition subsequent to the respective acquisition dates are included in the Consolidated Statements of Operations. Applicable transaction expenses associated with these acquisitions are included in Combination, integration and other acquisition-related expenses in the Company’s Consolidated Statements of Operations. Certain pro forma and other information is not presented, as the operations of the acquired assets and businesses are not considered material to the overall operations of the Company for the periods presented.

Note 3 – Recently Issued Accounting Standards

Recently Issued Accounting Standards Adopted

The FASB issued ASU 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting* in March 2020. The FASB subsequently issued ASU 2021-01, *Reference Rate Reform (Topic 848): Scope* in January 2021, which clarified the guidance, and ASU 2022-06, *Reference Rate Reform (Topic 848): Deferral of the Sunset Date of Topic 848*, which defers the sunset date of Topic 848 from December 31, 2022 to December 31, 2024. Neither ASU materially changed the guidance or its applicability to the Company. The amendments provide temporary optional expedients and exceptions for applying U.S. GAAP to contract modifications, hedging relationships, and other transactions to ease the potential accounting and financial reporting burden associated with transitioning away from reference rates that are expected to be discontinued, including the London Interbank Offered Rate (“LIBOR”). ASU 2020-04 is effective for the Company as of March 12, 2020 and generally can be applied through December 31, 2024. On June 17, 2022, the Company entered into an amendment to its primary credit facility, which, among other things, provided for the use of a USD currency LIBOR successor rate (the Term Secured Overnight Financing Rate (“Term SOFR”)). See Note 20 of Notes to Consolidated Financial Statements.

Note 4 – Business Segments

The Company’s operating segments, which are consistent with its reportable segments, reflect the structure of the Company’s internal organization, the method by which the Company’s resources are allocated and the manner by which the chief operating decision maker assesses the Company’s performance. The Company has three reportable segments: (i) Americas; (ii) EMEA; and (iii) Asia/Pacific. The segments are composed of the net sales and operations in each respective region. All prior period information has been recast to reflect the Company’s new reportable segments.

Segment operating earnings for each of the Company’s reportable segments are comprised of the segment’s net sales less directly related COGS and SG&A. Operating expenses not directly attributable to the net sales of each respective segment, such as certain corporate and administrative costs, Combination, integration and other acquisition-related expenses, and Restructuring and related charges, are not included in segment operating earnings. The figures presented for all periods reflect the Company’s current definition of directly related segment operating expenses and operating expenses not directly attributable to the net sales of each respective segment. As applicable, immaterial prior year reclassifications have been reflected to conform with the current year presentation. Other items not specifically identified with the Company’s reportable segments include Interest expense, net and Other (expense) income, net.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The following tables present information about the performance of the Company's reportable segments for the years ended December 31, 2022, 2021 and 2020.

	2022	2021	2020
Net sales			
Americas	\$ 946,516	\$ 762,211	\$ 607,043
EMEA	562,508	564,128	455,939
Asia/Pacific	434,561	434,819	354,695
Total net sales	\$ 1,943,585	\$ 1,761,158	\$ 1,417,677
	2022	2021	2020
Segment operating earnings			
Americas	\$ 223,629	\$ 176,253	\$ 141,870
EMEA	76,364	110,981	92,493
Asia/Pacific	105,842	109,233	100,196
Total segment operating earnings	405,835	396,467	334,559
Combination, integration and other acquisition-related expenses	(8,779)	(23,885)	(29,790)
Restructuring and related charges	(3,163)	(1,433)	(5,541)
Fair value step up of acquired inventory sold	—	(801)	(226)
Impairment charges	(93,000)	—	(38,000)
Non-operating and administrative expenses	(187,841)	(157,309)	(144,173)
Depreciation of corporate assets and amortization	(60,748)	(62,573)	(57,469)
Operating income	52,304	150,466	59,360
Other (expense) income, net	(12,607)	18,851	(5,618)
Interest expense, net	(32,579)	(22,326)	(26,603)
Income before taxes and equity in net income of associated companies	\$ 7,118	\$ 146,991	\$ 27,139

The following tables present information regarding the Company's reportable segments' assets and long-lived assets, excluding goodwill, as of December 31, 2022, 2021 and 2020. Management does not use goodwill by segment to evaluate performance or allocate resources.

	2022	2021	2020
Segment assets, excluding goodwill			
Americas	\$ 1,196,906	\$ 1,160,921	\$ 1,147,783
EMEA	583,861	685,812	539,598
Asia/Pacific	525,847	477,833	573,241
Total segment assets	\$ 2,306,614	\$ 2,324,566	\$ 2,260,622
	2022	2021	2020
Segment long-lived assets			
Americas	\$ 150,294	\$ 145,390	\$ 146,074
EMEA	87,279	89,637	94,969
Asia/Pacific	120,761	125,365	128,927
Total segment long-lived assets	\$ 358,334	\$ 360,392	\$ 369,970

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The following tables present information regarding the Company's reportable segments' capital expenditures and depreciation for identifiable assets for the years ended December 31, 2022, 2021 and 2020:

	2022	2021	2020
Capital expenditures			
Americas	\$ 19,121	\$ 11,716	\$ 7,834
EMEA	6,065	7,428	4,377
Asia/Pacific	3,353	2,313	5,690
Total segment capital expenditures	<u>\$ 28,539</u>	<u>\$ 21,457</u>	<u>\$ 17,901</u>
	2022	2021	2020
Depreciation			
Americas	\$ 11,723	\$ 13,599	\$ 14,512
EMEA	6,608	8,294	8,035
Asia/Pacific	4,593	4,756	4,805
Total segment depreciation	<u>\$ 22,924</u>	<u>\$ 26,649</u>	<u>\$ 27,352</u>

During the years ended December 31, 2022, 2021 and 2020, the Company had approximately \$1,246.7 million, \$1,198.4 million and \$963.2 million of net sales, respectively, attributable to non-U.S. operations. As of December 31, 2022, 2021 and 2020, the Company had approximately \$156.4 million, \$155.2 million and \$176.6 million of long-lived assets, respectively, attributable to non-U.S. operations.

Inter-segment revenue for the years ended December 31, 2022, 2021 and 2020 was \$11.6 million, \$13.3 million and \$16.8 million for Americas, \$44.6 million, \$40.4 million and \$28.1 million for EMEA, \$1.0 million, and \$2.0 million and \$0.9 million for Asia/Pacific, respectively. However, all inter-segment transactions have been eliminated from each reportable operating segment's net sales and earnings for all periods presented in the above tables.

Note 5 – Net Sales and Revenue Recognition

Arrangements Resulting in Net Reporting

As part of the Company's Fluidcare™ business, certain third-party product sales to customers are managed by the Company. The Company transferred third-party products under arrangements resulting in net reporting of \$83.8 million, \$71.7 million and \$42.5 million for the years ended December 31, 2022, 2021 and 2020, respectively.

Customer Concentration

A significant portion of the Company's revenues are realized from the sale of process fluids and services to manufacturers of steel, aluminum, automobiles, aircraft, industrial equipment, and durable goods. During the year ended December 31, 2022, the Company's five largest customers (each composed of multiple subsidiaries or divisions with semiautonomous purchasing authority) accounted for approximately 11% of consolidated net sales, with its largest customer accounting for approximately 3% of consolidated net sales.

Contract Assets and Liabilities

The Company had no material contract assets recorded on its Consolidated Balance Sheets as of December 31, 2022 and 2021.

The Company had approximately \$5.7 million and \$7.0 million of deferred revenue as of December 31, 2022 and 2021, respectively. During the years ended December 31, 2022 and 2021, respectively, the Company satisfied all of the associated performance obligations and recognized into revenue the advance payments received and recorded as of December 31, 2021 and 2020, respectively.

Disaggregated Revenue

The Company sells its various industrial process fluids, its specialty chemicals and its technical expertise as a global product portfolio. The Company generally manages and evaluates its performance by segment first, and then by customer industry, rather than by individual product lines. Also, net sales of each of the Company's major product lines are generally spread throughout all three of the Company's geographic regions, and in most cases, approximately proportionate to the level of total sales in each region.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The following tables present disaggregated information regarding the Company's net sales, first by major product lines that represent more than 10% of the Company's consolidated net sales for any of the years ended December 31, 2022, 2021 and 2020, and followed then by a disaggregation of the Company's net sales by segment, geographic region, customer industry, and timing of revenue recognized for the years ended December 31, 2022, 2021 and 2020.

	2022	2021	2020
Metal removal fluids	22.9 %	23.4 %	23.9 %
Rolling lubricants	20.8 %	22.2 %	21.8 %
Hydraulic fluids	14.1 %	13.6 %	13.3 %

Net sales for the year ending December 31, 2022

	Americas	EMEA	Asia/Pacific	Consolidated Total
Customer Industries				
Metals	\$ 252,513	\$ 137,767	\$ 214,377	\$ 604,657
Metalworking and other	694,003	424,741	220,184	1,338,928
	<u>\$ 946,516</u>	<u>\$ 562,508</u>	<u>\$ 434,561</u>	<u>\$ 1,943,585</u>

Timing of Revenue Recognized

Product sales at a point in time	\$ 902,969	\$ 551,013	\$ 393,931	\$ 1,847,913
Services transferred over time	43,547	11,495	40,630	95,672
	<u>\$ 946,516</u>	<u>\$ 562,508</u>	<u>\$ 434,561</u>	<u>\$ 1,943,585</u>

Net sales for the year ending December 31, 2021

	Americas	EMEA	Asia/Pacific	Consolidated Total
Customer Industries				
Metals	\$ 210,340	\$ 141,950	\$ 207,160	\$ 559,450
Metalworking and other	551,871	422,178	227,659	1,201,708
	<u>\$ 762,211</u>	<u>\$ 564,128</u>	<u>\$ 434,819</u>	<u>\$ 1,761,158</u>

Timing of Revenue Recognized

Product sales at a point in time	\$ 726,229	\$ 525,623	\$ 420,003	\$ 1,671,855
Services transferred over time	35,982	38,505	14,816	89,303
	<u>\$ 762,211</u>	<u>\$ 564,128</u>	<u>\$ 434,819</u>	<u>\$ 1,761,158</u>

Net sales for the year ending December 31, 2020

	Americas	EMEA	Asia/Pacific	Consolidated Total
Customer Industries				
Metals	\$ 163,135	\$ 107,880	\$ 168,096	\$ 439,111
Metalworking and other	443,908	348,059	186,599	978,566
	<u>\$ 607,043</u>	<u>\$ 455,939</u>	<u>\$ 354,695</u>	<u>\$ 1,417,677</u>

Timing of Revenue Recognized

Product sales at a point in time	\$ 570,152	\$ 417,725	\$ 341,104	\$ 1,328,981
Services transferred over time	36,891	38,214	13,591	88,696
	<u>\$ 607,043</u>	<u>\$ 455,939</u>	<u>\$ 354,695</u>	<u>\$ 1,417,677</u>

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Note 6 – Leases

The Company has operating leases for certain facilities, vehicles and machinery and equipment with remaining lease terms up to 9 years. In addition, the Company has certain land use leases with remaining lease terms up to 93 years.

The Company's finance leases are included in PP&E on the Consolidated Balance Sheet. See Note 15 of Notes to Consolidated Financial Statements. The Company has no material variable lease costs or sublease income for the years ended December 31, 2022, 2021 and 2020. The following table sets forth the components of the Company's lease cost for the years ended December 31, 2022, 2021 and 2020:

	December 31, 2022	December 31, 2021	December 31, 2020
Operating lease expense	\$ 15,171	\$ 14,061	\$ 14,247
Short-term lease expense	816	861	1,308

Supplemental cash flow information related to the Company's leases is as follows:

	December 31, 2022	December 31, 2021	December 31, 2020
Cash paid for amounts included in the measurement of lease liabilities:			
Operating cash flows from operating leases	\$ 19,215	\$ 13,859	\$ 14,101
Non-cash lease liabilities activity:			
Leased assets obtained in exchange for new operating lease liabilities	23,356	11,142	6,949

Supplemental balance sheet information related to the Company's leases is as follows:

	December 31, 2022	December 31, 2021
Right of use lease assets	\$ 43,766	\$ 36,635
Other accrued liabilities	12,024	9,976
Long-term lease liabilities	26,967	26,335
Total operating lease liabilities	<u>\$ 38,991</u>	<u>\$ 36,311</u>
Weighted average remaining lease term (years)	5.1	5.6
Weighted average discount rate	4.36 %	4.22 %

Maturities of operating lease liabilities as of December 31, 2022 were as follows:

	December 31, 2022
For the year ended December 31, 2023	\$ 13,551
For the year ended December 31, 2024	11,149
For the year ended December 31, 2025	7,266
For the year ended December 31, 2026	5,280
For the year ended December 31, 2027	2,457
For the year ended December 31, 2028 and beyond	5,299
Total lease payments	45,002
Less: imputed interest	(6,011)
Present value of lease liabilities	<u>\$ 38,991</u>

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Note 7 – Restructuring and Related Activities

The Company's Management approved a global restructuring plan (the "QH Program") as part of its initial plan to realize certain cost synergies associated with the Combination in the third quarter of 2019. The QH Program included restructuring and associated severance costs to reduce total headcount by approximately 400 people globally, as well as plans for the closure of certain manufacturing and non-manufacturing facilities. As of December 31, 2022, the Company has substantially completed all of the initiatives under the QH Program with only an immaterial amount of remaining severance still to be paid, which is expected to be completed during 2023.

In response to current macroeconomic headwinds and softer operating conditions, in 2022, the Company's Management initiated a global cost and optimization program to improve its cost structure and drive a more profitable and productive organization. This program has and will include certain restructuring activities as part of the plan to further optimize and strengthen the Company's footprint, optimize the go-to-market strategy, simplify the portfolio and organization, and enable the Company to deliver on its strategic plan. During the fourth quarter of 2022, initial actions under this program included restructuring and associated severance costs to reduce headcount by approximately 40 positions globally. These headcount reductions began in the fourth quarter of 2022 and are expected to be completed in 2023.

Under the Company's restructuring programs, employee separation benefits varied depending on local regulations within certain foreign countries and included severance and other benefits. The exact timing to complete all actions and final costs associated will depend on a number of factors and are subject to change. Restructuring costs incurred during the years ended December 31, 2022, 2021 and 2020 include severance costs to reduce headcount, including customary and routine adjustments to initial estimates for employee separation costs, as well as costs to close certain facilities and are recorded in Restructuring and related charges in the Company's Consolidated Statements of Operations.

In connection with the plans for closure of certain manufacturing and non-manufacturing facilities, the Company has made available for sale certain facilities and property. During the years ended December 31, 2022, 2021 and 2020, certain of these facilities were sold and the Company recognized a gain of \$0.2 million in 2022 and \$5.4 million in 2021 and a loss of approximately \$0.6 million in 2020, which is included within Other (expense) income, net on the Consolidated Statements of Operations. Additionally, certain land with an aggregate book value of approximately \$0.6 million continues to be held-for-sale as of December 31, 2022 and is recorded in Prepaid expenses and other current assets on the Company's Consolidated Balance Sheets. The Company expects to complete the sale of this land in 2023. The Company will continue to evaluate actions to strengthen and optimize its existing facilities and footprint and this may include making certain other facilities or property available for sale in the future. As described in Note 4 of Notes to Consolidated Financial Statements, Restructuring and related charges are not included in the Company's calculation of reportable segments' measure of operating earnings and therefore these costs are not reviewed by or recorded to reportable segments.

Activity in the Company's accrual for restructuring for the years ended December 31, 2022 and 2021 are as follows:

	Restructuring Programs
Accrued restructuring as of December 31, 2020	\$ 8,248
Restructuring and related charges	1,433
Cash payments	(5,266)
Currency translation adjustments	(328)
Accrued restructuring as of December 31, 2021	4,087
Restructuring and related charges	3,163
Cash payments	(1,532)
Currency translation adjustments	(235)
Accrued restructuring as of December 31, 2022	<u>\$ 5,483</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Note 8 – Share-Based Compensation

The Company recognized the following share-based compensation expense in its Consolidated Statements of Operations for the years ended December 31, 2022, 2021 and 2020:

	2022	2021	2020
Stock options	\$ 1,774	\$ 1,235	\$ 1,491
Non-vested stock awards and restricted stock units	6,679	5,438	5,012
Non-elective and elective 401(k) matching contribution in stock	—	1,553	3,112
Director stock ownership plan	63	901	541
Performance stock units	3,150	1,911	840
Total share-based compensation expense	<u>\$ 11,666</u>	<u>\$ 11,038</u>	<u>\$ 10,996</u>

Share-based compensation expense is recorded in SG&A, except for \$0.2 million, \$0.9 million and \$1.5 million during the years ended December 31, 2022, 2021 and 2020, respectively, recorded within Combination, integration and other acquisition-related expenses.

Stock Options

Stock option activity under all plans is as follows:

	Number of Options	Weighted Average Exercise Price (per option)	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Options outstanding as of January 1, 2022	109,684	\$ 165.47		
Options granted	31,914	222.82		
Options exercised	(11,801)	133.10		
Options forfeited	(10,315)	172.41		
Options outstanding as of December 31, 2022	<u>119,482</u>	\$ 183.39	4.7	\$ (373)
Options expected to vest after December 31, 2022	<u>54,245</u>	\$ 182.20	5.5	\$ (830)
Options exercisable as of December 31, 2022	<u>65,237</u>	\$ 159.93	3.9	\$ 455

The total intrinsic value of options exercised during the years ended December 31, 2022, 2021 and 2020 was approximately \$0.8 million, \$2.7 million and \$6.5 million, respectively. Intrinsic value is calculated as the difference between the current market price of the underlying security and the strike price of a related option.

A summary of the Company's outstanding stock options as of December 31, 2022 is as follows:

Range of Exercise Prices	Number of Options Outstanding	Weighted Average Remaining Contractual Term (years)	Weighted Average Exercise Price (per option)	Number of Options Exercisable	Weighted Average Exercise Price (per option)
\$ 120.01 - \$ 150.00	40,781	4.5	137.28	23,262	136.64
\$ 150.01 - \$ 180.00	56,834	4.6	164.63	33,833	155.35
\$ 220.01 - \$ 250.00	21,867	5.2	245.10	8,142	245.49
	<u>119,482</u>	4.7	183.39	<u>65,237</u>	159.93

As of December 31, 2022, unrecognized compensation expense related to options granted during the years ended December 31, 2022, 2021 and 2020 was \$0.8 million, \$0.5 million and \$0.1 million, respectively, to be recognized over a weighted average period of 1.3 years.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The Company granted stock options under its LTIP plan that are subject only to time vesting generally over a three year period during 2022, 2021, 2020 and 2019. For the purposes of determining the fair value of stock option awards, the Company used a Black-Scholes option pricing model and primarily used the assumptions set forth in the table below:

	July 2022 Grant	March 2022 Grant	2021	2020	2019
Number of stock options granted	4,837	27,077	25,250	49,115	51,610
Dividend yield	0.79 %	0.80 %	0.85 %	0.99 %	1.12 %
Expected volatility	40.47 %	38.60 %	37.33 %	31.57 %	26.29 %
Risk-free interest rate	2.87 %	2.07 %	0.60 %	0.36 %	1.52 %
Expected term (years)	4.0	4.0	4.0	4.0	4.0

The fair value of these options is being amortized on a straight-line basis over the respective vesting period of each award. The compensation expense recorded on each award during the years ended December 31, 2022, 2021 and 2020, respectively, is as follows:

	2022	2021	2020
2022 Stock option awards	\$ 783	\$ —	\$ —
2021 Stock option awards	521	429	—
2020 Stock option awards	443	516	385
2019 Stock option awards	27	234	698
2018 Stock option awards	—	56	357

Restricted Stock Awards

Activity of non-vested restricted stock awards granted under the Company's LTIP plan is shown below:

	Number of Shares	Weighted Average Grant Date Fair Value (per share)
Nonvested awards, December 31, 2021	68,693	\$ 179.26
Granted	54,433	166.07
Vested	(38,583)	175.80
Forfeited	(5,088)	184.64
Nonvested awards, December 31, 2022	<u>79,455</u>	<u>\$ 171.61</u>

The fair value of the non-vested stock is based on the trading price of the Company's common stock on the date of grant. The Company adjusts the grant date fair value for expected forfeitures based on historical experience for similar awards. As of December 31, 2022, unrecognized compensation expense related to these awards was \$7.4 million, to be recognized over a weighted average remaining period of 1.6 years.

Restricted Stock Units

Activity of non-vested restricted stock units granted under the Company's LTIP plan is shown below:

	Number of Units	Weighted Average Grant Date Fair Value (per unit)
Nonvested awards, December 31, 2021	10,977	\$ 170.82
Granted	10,703	169.29
Vested	(3,009)	158.09
Forfeited	(171)	190.37
Nonvested awards, December 31, 2022	<u>18,500</u>	<u>\$ 171.83</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The fair value of the non-vested restricted stock units is based on the trading price of the Company's common stock on the date of grant. The Company adjusts the grant date fair value for expected forfeitures based on historical experience for similar awards. As of December 31, 2022, unrecognized compensation expense related to these awards was \$1.7 million, to be recognized over a weighted average remaining period of 1.9 years.

Performance Stock Units

The Company grants performance-dependent stock awards ("PSUs") as a component of its LTIP, which will be settled in a certain number of shares subject to market-based and time-based vesting conditions. The number of fully vested shares that may ultimately be issued as settlement for each award may range from 0% up to 200% of the target award, subject to the achievement of the Company's total shareholder return ("TSR") relative to the performance of the Company's peer group, the S&P Midcap 400 Materials group. The service period required for the PSUs is three years and the TSR measurement period for the PSUs is generally from January 1 of the year of grant through December 31 of the year prior to issuances of the shares upon settlement.

Compensation expense for PSUs is measured based on their grant date fair value and is recognized on a straight-line basis over the three year vesting period. The grant-date fair value of the PSUs was estimated using a Monte Carlo simulation on the grant date and using the following assumptions set forth in the table below:

	2022	CEO Grant 2021 (1)	2021	2020
Number of PSUs granted	18,462	3,775	12,103	18,485
Risk-free interest rate	2.11 %	0.65 %	0.29 %	0.28 %
Dividend yield	0.93 %	0.72 %	0.64 %	1.13 %
Expected term (years)	3.0	3.0	3.0	3.0

- (1) On September 2, 2021, the Board appointed Andrew Tometich to serve as CEO and entered into an Employment Agreement, and granted an equity award consisting of a mix of time-based restricted stock and PSUs.

As of December 31, 2022, there was approximately \$4.0 million of total unrecognized compensation cost related to PSUs which the Company expects to recognize over a weighted-average period of 1.8 years.

Defined Contribution Plan

Beginning in April 2020 and continuing through March 2021, the Company matched both non-elective and elective 401(k) contributions in fully vested shares of the Company's common stock rather than cash. There were no matching contributions in stock for the year ended December 31, 2022. For the years ended December 31, 2021 and 2020, total contributions in stock were \$1.5 million and \$3.1 million, respectively.

2013 Director Stock Ownership Plan

In 2013, the Company adopted the 2013 Director Stock Ownership Plan (the "Plan"), to encourage the Directors to increase their investment in the Company, which was approved at the Company's May 2013 shareholders' meeting. The Plan authorizes the issuance of up to 75,000 shares of Quaker common stock in accordance with the terms of the Plan in payment of all or a portion of the annual cash retainer payable to each of the Company's non-employee directors in 2013 and subsequent years during the term of the Plan. Under the Plan, each director who, on May 1 of the applicable calendar year, owns less than 400% of the annual cash retainer for the applicable calendar year, divided by the average of the closing price of a share of Quaker Common Stock as reported by the composite tape of the New York Stock Exchange for the previous calendar year (the "Threshold Amount"), is required to receive 75% of the annual cash retainer in Quaker common stock and 25% of the retainer in cash, unless the director elects to receive a greater percentage of Quaker common stock, up to 100% of the annual cash retainer for the applicable year. Each director who owns more than the Threshold Amount may elect to receive common stock in payment of a percentage (up to 100%) of the annual cash retainer. The annual retainer is \$0.1 million and the retainer payment date is June 1.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Note 9 – Other (Expense) Income, net

Other (expense) income, net, for the years ended December 31, 2022, 2021 and 2020 are as follows:

	2022	2021	2020
Income from third party license fees	\$ 1,268	\$ 1,367	\$ 999
Foreign exchange losses, net	(9,399)	(3,821)	(6,082)
Gain (loss) on disposals of property, plant, equipment and other assets, net	168	4,695	(871)
Non-income tax refunds and other related (expense) credits	(1,613)	15,155	3,345
Pension and postretirement benefit income (costs), non-service components	1,704	759	(21,592)
Loss on extinguishment of debt	(6,763)	—	—
Gain on insurance recoveries	1,804	—	18,144
Other non-operating income, net	224	696	439
Total other (expense) income, net	\$ (12,607)	\$ 18,851	\$ (5,618)

Foreign exchange losses, net, during the years ended December 31, 2022, 2021 and 2020, include foreign currency transaction losses of approximately \$1.6 million, \$0.6 million and \$0.4 million, respectively, related to hyper-inflationary accounting. See Note 1 of Notes to Consolidated Financial Statements.

Gain (loss) on disposals of property, plant, equipment and other assets, net, includes losses related to certain fixed asset disposals resulting from the property damage caused by flooding of the Company's Conshohocken, Pennsylvania headquarters in 2021, described in Note 26 of Notes to Consolidated Financial Statements. This caption also includes a gain in 2022 and 2021 and a loss in 2020 on the sale of certain held-for-sale real property assets related to the Combination, described in Note 7 of Notes to Consolidated Financial Statements.

Non-income tax refunds and other related (expense) credits during the year ended December 31, 2022 includes adjustments to Combination-related indemnification assets associated with the settlement of certain income tax audits at certain of the Company's Italian and German affiliates for tax periods prior to August 1, 2019, whereas during the year ended December 31, 2021 this includes certain non-income tax credits for the Company's Brazilian subsidiaries described in Note 26 of Notes to Consolidated Financial Statements.

Pension and postretirement benefit income (costs), non-service components during the year ended December 31, 2020 include a \$1.6 million refund in premium and a \$22.7 million non-cash settlement charge related to the termination of a noncontributory U.S. pension plan, as described in Note 21 of Notes to Consolidated Financial Statements.

Loss on extinguishment of debt during the year ended December 31, 2022 includes the write-off of certain previously unamortized deferred financing costs as well as a portion of the third party and creditor debt issuance costs incurred to execute an amendment to the Company's primary credit facility. See Note 20 of Notes to Consolidated Financial Statements.

Gain on insurance recoveries for the year ended December 31, 2022 reflects payments received from insurers related to the property damage incurred during 2021, noted above, whereas for the year ended December 31, 2020, this amount relates to the termination of restrictions over certain cash that was previously designated solely to be used for settlement of asbestos claims at an inactive subsidiary of the Company and cash proceeds from an insolvent insurance carrier with respect to previously filed recovery claims. See Note 12, Note 19 and Note 26 of Notes to Consolidated Financial Statements.

Note 10 – Taxes on Income

On December 22, 2017, the U.S. government enacted comprehensive tax legislation which we refer to as U.S. Tax Reform. U.S. Tax Reform implemented a new system of taxation for non-U.S. earnings which eliminated U.S. federal income taxes on dividends from certain foreign subsidiaries and imposed a one-time transition tax on the deemed repatriation of undistributed earnings of certain foreign subsidiaries that is payable over eight years.

Following numerous regulations, notices, and other formal guidance published by the Internal Revenue Service ("IRS"), U.S. Department of Treasury, and various state taxing authorities, the Company completed its accounting for the transition tax and has elected to pay its \$15.5 million transition tax in installments over eight years as permitted under U.S. Tax Reform. As of December 31, 2022, \$6.9 million in installments have been paid with the remaining \$8.6 million to be paid through installments in future years.

As of December 31, 2022, the Company has a deferred tax liability of \$6.8 million on certain undistributed foreign earnings, which primarily represents the Company's estimate of the non-U.S. income taxes the Company will incur to ultimately remit certain earnings to the U.S. The Company's reinvestment assertions as further explained below.

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

Taxes on income before equity in net income of associated companies for the years ended December 31, 2022, 2021 and 2020 are as follows:

	2022	2021	2020
Current:			
Federal	\$ (708)	\$ 955	\$ (1,359)
State	1,450	2,115	1,171
Foreign	34,735	44,375	33,173
	<u>35,477</u>	<u>47,445</u>	<u>32,985</u>
Deferred:			
Federal	(2,798)	(3,863)	(28,437)
State	(713)	(3,117)	(3,087)
Foreign	(7,041)	(5,526)	(6,757)
Total	<u>\$ 24,925</u>	<u>\$ 34,939</u>	<u>\$ (5,296)</u>

The components of earnings before income taxes for the years ended December 31, 2022, 2021 and 2020 are as follows:

	2022	2021	2020
U.S.	\$ (4,933)	\$ 7,263	\$ (66,585)
Foreign	12,051	139,728	93,724
Total	<u>\$ 7,118</u>	<u>\$ 146,991</u>	<u>\$ 27,139</u>

Total deferred tax assets and liabilities are composed of the following as of December 31, 2022 and 2021:

	2022	2021
Retirement benefits	\$ 8,469	\$ 11,860
Allowance for credit losses	2,246	2,155
Insurance and litigation reserves	716	675
Performance incentives	3,327	2,881
Equity-based compensation	2,723	1,920
Prepaid expense	486	460
Operating loss carryforward	20,519	18,544
Foreign tax credit and other credits	5,506	16,285
Interest	9,928	9,940
Restructuring reserves	791	631
Right of use lease assets	8,440	8,322
Inventory reserves	2,967	2,941
Research and development	11,936	8,832
Other	4,307	2,846
	<u>82,361</u>	<u>88,292</u>
Valuation allowance	(11,730)	(17,400)
Total deferred tax assets, net	<u>\$ 70,631</u>	<u>\$ 70,892</u>
Depreciation	11,935	11,580
Foreign pension and other	2,691	2,332
Intangibles	182,838	197,066
Lease liabilities	9,590	8,421
Outside basis in equity investment	5,886	5,999
Unremitted Earnings	6,766	8,381
Total deferred tax liabilities	<u>\$ 219,706</u>	<u>\$ 233,779</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The Company has \$7.4 million of deferred tax assets related to state net operating losses. Management analyzed the expected impact of the reversal of existing taxable temporary differences, considered expiration dates, analyzed current state tax laws, and determined that \$1.7 million of state net operating loss carryforwards is expected to be realized as a future benefit based on the reversal of deferred tax liabilities. Accordingly, a partial valuation allowance of \$5.7 million has been established. These state net operating losses are subject to various carryforward periods of 5 years to 20 years or an indefinite carryforward period. An additional \$0.9 million of valuation allowance was established for other net state deferred tax assets.

The Company has \$13.1 million of deferred tax assets related to foreign net operating loss carryforwards. A partial valuation allowance of \$2.3 million has been established against this amount resulting in a net \$10.8 million expected future benefit. These foreign net operating losses are subject to various carryforward periods with the majority having an indefinite carryforward period. An additional partial valuation allowance of \$1.5 million has been established against certain other foreign deferred tax assets.

In conjunction with the Combination, the Company acquired foreign tax credit deferred tax assets of \$41.8 million expiring between 2019 and 2028. Foreign tax credits may be carried forward for 10 years. Management analyzed the expected impact of the utilization of foreign tax credits based on certain assumptions such as projected U.S. taxable income, overall domestic loss recapture, and annual limitations due to the ownership change under the Internal Revenue Code. The Company had a foreign tax credit carry forward of \$5.2 million and \$15.9 million as of December 31, 2022 and 2021, respectively, with a \$1.3 million and \$5.8 million valuation allowance as of December 31, 2022 and 2021, respectively, reflecting the amount of credits that are not expected to be utilized before expiration.

The Company also acquired disallowed interest deferred tax assets of \$14.0 million as part of the Combination. Disallowed interest may be carried forward indefinitely. Management analyzed the expected impact of the utilization of disallowed interest carryforwards based on projected US taxable income and determined that the Company will utilize all expected future benefits by 2028. As of December 31, 2022, the Company had a net realizable disallowed interest carryforward of \$10.1 million on its balance sheet related to its US operations and \$0.6 million related to non-US operations.

As of December 31, 2022, the Company had deferred tax liabilities of \$169.4 million primarily related to the step-up in intangibles resulting from the Combination and Norman Hay acquisition.

As part of the Combination, the Company acquired a 50% interest in the Korea Houghton Corporation joint venture and has recorded a \$5.9 million deferred tax liability for its outside basis difference.

The following are the changes in the Company's deferred tax asset valuation allowance for the years ended December 31, 2022, 2021 and 2020:

	Balance at Beginning of Period	Purchase Accounting Adjustments	Additional Valuation Allowance	Allowance Utilization and Other	Effect of Exchange Rate Changes	Balance at End of Period
Valuation Allowance						
Year ended December 31, 2022	\$ 17,400	\$ —	\$ 1,326	\$ (6,789)	\$ (207)	\$ 11,730
Year ended December 31, 2021	\$ 21,511	\$ —	\$ 29	\$ (4,470)	\$ 330	\$ 17,400
Year ended December 31, 2020	\$ 13,834	\$ 7,148	\$ 2,738	\$ (2,153)	\$ (56)	\$ 21,511

The Company's net deferred tax assets and liabilities are classified in the Consolidated Balance Sheets as of December 31, 2022 and 2021 as follows:

	2022	2021
Non-current deferred tax assets	\$ 11,218	\$ 16,138
Non-current deferred tax liabilities	160,294	179,025
Net deferred tax liability	<u>\$ (149,076)</u>	<u>\$ (162,887)</u>

QUAKER CHEMICAL CORPORATION
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

The following is a reconciliation of income taxes at the Federal statutory rate with income taxes recorded by the Company for the years ended December 31, 2022, 2021 and 2020. Certain immaterial reclassifications within the presentation of the reconciliation of income taxes have been made to the years ended December 31, 2021 and 2020:

	2022	2021	2020
Income tax provision at the Federal statutory tax rate	\$ 1,495	\$ 30,868	\$ 5,699
Unremitted earnings	(1,839)	1,841	(2,308)
Tax law changes / reform	823	1,955	(1,059)
U.S. tax on foreign operations	4,864	10,479	5,140
Pension settlement	—	—	(2,247)
Foreign derived intangible income	(917)	(8,698)	(7,339)
Non-deductible acquisition expenses	45	129	131
Withholding taxes	7,785	6,584	7,809
Foreign tax credits	(5,850)	(14,725)	(4,699)
Share-based compensation	1,234	600	335
Foreign tax rate differential	4,782	1,712	332
Research and development credit	(1,757)	(1,685)	(1,018)
Audit Settlements	2,697	1,378	807
Uncertain tax positions	(6,375)	519	1,990
State income tax provisions, net	432	(1,446)	(2,245)
Non-deductible meals and entertainment	146	426	290
Intercompany transfer of intangible assets	(1,932)	4,347	(4,384)
Goodwill Impairment	19,550	—	—
Miscellaneous items, net	(258)	655	(2,530)
Taxes on income before equity in net income of associated companies	<u>\$ 24,925</u>	<u>\$ 34,939</u>	<u>\$ (5,296)</u>

Pursuant to U.S. Tax Reform, the Company recorded a \$15.5 million transition tax liability for U.S. income taxes on the undistributed earnings of non-U.S. subsidiaries. However, the Company may also be subject to other taxes, such as withholding taxes and dividend distribution taxes, if these undistributed earnings are ultimately remitted to the U.S. As a result of the Combination, additional third-party debt was incurred resulting in the Company re-evaluating its global cash strategy in order to meet its goal of reducing leverage in upcoming years. As of December 31, 2022, the Company has a deferred tax liability \$6.8 million, which primarily represents the estimate of the non-U.S. taxes the Company will incur to ultimately remit these earnings to the U.S. It is the Company's current intention to reinvest its additional undistributed earnings of non-U.S. subsidiaries to support working capital needs and certain other growth initiatives outside of the U.S. The amount of such undistributed earnings at December 31, 2022 was approximately \$424.7 million. Any tax liability which might result from ultimate remittance of these earnings is expected to be substantially offset by foreign tax credits (subject to certain limitations). It is currently impractical to estimate any such incremental tax expense.

As of December 31, 2022, the Company's cumulative liability for gross unrecognized tax benefits was \$16.3 million. The Company had accrued approximately \$1.3 million for cumulative penalties and \$2.7 million for cumulative interest as of December 31, 2022. As of December 31, 2021, the Company's cumulative liability for gross unrecognized tax benefits was \$22.5 million. The Company had accrued approximately \$3.1 million for cumulative penalties and \$3.1 million for cumulative interest as of December 31, 2021.

The Company continues to recognize interest and penalties associated with uncertain tax positions as a component of tax expense on income before equity in net income of associated companies in its Consolidated Statements of Operations. The Company recognized a benefit of \$1.7 million for penalties and a benefit of \$0.3 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2022, a benefit of \$0.5 million for penalties and an expense of \$0.3 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2021, and an expense of less than \$0.1 million for penalties and an expense of \$0.6 million for interest (net of expirations and settlements) in its Consolidated Statement of Income for the year ended December 31, 2020.

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The Company estimates that during the year ending December 31, 2022, it will reduce its cumulative liability for gross unrecognized tax benefits by approximately \$4.9 million due to the expiration of the statute of limitations with regard to certain tax positions. This estimated reduction in the cumulative liability for unrecognized tax benefits does not consider any increase in liability for unrecognized tax benefits with regard to existing tax positions or any increase in cumulative liability for unrecognized tax benefits with regard to new tax positions for the year ending December 31, 2022.

A reconciliation of the beginning and ending amounts of unrecognized tax benefits for the years ended December 31, 2022, 2021 and 2020, respectively, is as follows:

	2022	2021	2020
Unrecognized tax benefits as of January 1	\$ 22,464	\$ 22,152	\$ 19,097
(Decrease) increase in unrecognized tax benefits taken in prior periods	(1,174)	1,002	2,025
Increase in unrecognized tax benefits taken in current period	953	2,915	3,095
Decrease in unrecognized tax benefits due to lapse of statute of limitations	(2,378)	(1,527)	(2,024)
Decrease in unrecognized tax benefits due to audit settlements	(2,509)	(1,104)	(1,635)
Increase in unrecognized tax benefits due to acquisition	—	—	597
(Decrease) increase due to foreign exchange rates	(1,016)	(974)	997
Unrecognized tax benefits as of December 31	<u>\$ 16,340</u>	<u>\$ 22,464</u>	<u>\$ 22,152</u>

The amount of net unrecognized tax benefits above that, if recognized, would impact the Company's tax expense and effective tax rate is \$10.2 million, \$15.2 million and \$14.7 million for the years ended December 31, 2022, 2021 and 2020, respectively.

The Company and its subsidiaries are subject to U.S. Federal income tax, as well as the income tax of various state and foreign tax jurisdictions. Tax years that remain subject to examination by major tax jurisdictions include Italy from 2007, Brazil from 2011, the Netherlands from 2016, Canada, China, Mexico, Germany, Spain and the U.S. from 2018, the United Kingdom from 2019, India from fiscal year beginning April 1, 2017 and ending March 31, 2018, and various U.S. state tax jurisdictions from 2011.

As previously reported, the Italian tax authorities have assessed additional tax due from the Company's subsidiary, Quaker Italia S.r.l., relating to the tax years 2007 through 2015. The Company has filed for competent authority relief from these assessments under the Mutual Agreement Procedures ("MAP") of the Organization for Economic Co-Operation and Development for all years except 2007. In 2020, the respective tax authorities in Italy, Spain, and the Netherlands reached agreement with respect to the MAP proceedings, which the Company has accepted. As of December 31, 2022, the Company has received \$1.6 million in refunds from the Netherlands and Spain. In February 2022, the Company received a settlement notice from the Italian taxing authorities confirming the amount due of \$2.6 million, having granted the Company's request to utilize its remaining net operating losses to partially offset the liability. As of December 31, 2022, the Company has paid the full settlement, of which approximately \$0.2 million was refunded.

Houghton Italia, S.r.l is also involved in a corporate income tax audit with the Italian tax authorities covering tax years 2014 through 2018. During the fourth quarter of 2021, the Company settled a portion of the Houghton Italia, S.r.l. corporate income tax audit with the Italian tax authorities for the tax years 2014 and 2015. During the year ended December 31, 2022, the Company settled tax years 2016 through 2018 for a total of \$2.0 million. In total, the Company has now settled all years 2014 through 2018 for \$3.7 million. Accordingly, the Company has released all reserves relating to this audit for the settled tax years. As a result of the settlement and reserve release the Company recognized a net benefit to the tax provision of \$1.9 million during the year ended December 31, 2022. The Company has an indemnification receivable of \$3.6 million in connection with its claim against the former owners of Houghton for any pre-Combination tax liabilities arising from this matter, as well as other audit settlements and tax matters.

Houghton Deutschland GmbH was also under audit by the German tax authorities for tax years 2015 through 2017. In the second quarter of 2022, the Company settled the corporate tax audit for the tax years 2015-2017 with the German tax authorities for a total of \$0.3 million. The Company has an indemnification receivable of \$0.3 million in connection with its claim against the former owners of Houghton for any pre-Combination tax liabilities arising from this matter.

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Note 11 – Earnings Per Share

The following table summarizes earnings per share calculations for the years ended December 31, 2022, 2021 and 2020:

	2022	2021	2020
Basic earnings per common share			
Net (loss) income attributable to Quaker Chemical Corporation	\$ (15,931)	\$ 121,369	\$ 39,658
Less: loss (income) allocated to participating securities	92	(480)	(148)
Net (loss) income available to common shareholders	\$ (15,839)	\$ 120,889	\$ 39,510
Basic weighted average common shares outstanding	17,841,487	17,805,034	17,719,792
Basic (loss) earnings per common share	\$ (0.89)	\$ 6.79	\$ 2.23
Diluted earnings per common share			
Net (loss) income attributable to Quaker Chemical Corporation	\$ (15,931)	\$ 121,369	\$ 39,658
Less: loss (income) allocated to participating securities	92	(479)	(148)
Net (loss) income available to common shareholders	\$ (15,839)	\$ 120,890	\$ 39,510
Basic weighted average common shares outstanding	17,841,487	17,805,034	17,719,792
Effect of dilutive securities	15,005	50,090	31,087
Diluted weighted average common shares outstanding	17,856,492	17,855,124	17,750,879
Diluted (loss) earnings per common share	\$ (0.89)	\$ 6.77	\$ 2.22

Certain stock options, restricted stock units and PSUs are not included in the diluted earnings per share calculation when the effect would have been anti-dilutive. The calculated amount of anti-diluted shares not included were 28,222 in 2022, 4,070 in 2021 and 945 in 2020.

Note 12 – Restricted Cash

Prior to December 2020, the Company had restricted cash recorded in other assets related to proceeds from an inactive subsidiary of the Company which previously executed separate settlement and release agreements with two of its insurance carriers for an original total value of \$35.0 million. The proceeds of both settlements were restricted and could only be used to pay claims and costs of defense associated with the subsidiary's asbestos litigation. The proceeds of the settlement and release agreements were deposited into interest bearing accounts which earned less than \$0.1 million for the year ended December 31, 2020, offset by \$1.0 million of net payments during 2020. Due to the restricted nature of the proceeds, a corresponding deferred credit was established in other non-current liabilities for an equal and offsetting amount that continued until the restrictions lapsed.

During December 2020, the restrictions ended on these previously received insurance settlements and the Company transferred the cash into an operating account. In connection with the termination in restrictions, the Company recognized a \$35.0 million gain on its Consolidated Statement of Income in Other income (expense), net, for the amount of previously restricted cash, net of the estimated liability to pay claims and associated with the inactive subsidiary's asbestos litigation as of December 31, 2020. Therefore, due to these restrictions ending, there was no restricted cash for the years ended December 31, 2021 and 2022, respectively. See Notes 18, 22 and 26 of Notes to Consolidated Financial Statements.

The following table provides a reconciliation of cash, cash equivalents and restricted cash as December 31, 2022, 2021, 2020 and 2019:

	2022	2021	2020	2019
Cash and cash equivalents	\$ 180,963	\$ 165,176	\$ 181,833	\$ 123,524
Restricted cash included in other current assets	—	—	62	353
Restricted cash included in other assets	—	—	—	19,678
Cash, cash equivalents and restricted cash	<u>\$ 180,963</u>	<u>\$ 165,176</u>	<u>\$ 181,895</u>	<u>\$ 143,555</u>

Note 13 – Accounts Receivable and Allowance for Credit Losses

As of December 31, 2022 and 2021, the Company had gross trade accounts receivable totaling \$486.4 million and \$443.0 million, respectively.

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The following are changes in the allowance for credit losses during the years ended December 31, 2022, 2021 and 2020:

	Balance at Beginning of Period	Changes to Costs and Expenses	Write-Offs Charged to Allowance	Exchange Rate Changes and Other Adjustments	Balance at End of Period
Allowance for Credit Losses					
Year ended December 31, 2022	\$ 12,334	\$ 4,319	\$ (2,441)	\$ (685)	\$ 13,527
Year ended December 31, 2021	\$ 13,145	\$ 653	\$ (946)	\$ (518)	\$ 12,334
Year ended December 31, 2020	\$ 11,716	\$ 3,582	\$ (2,187)	\$ 34	\$ 13,145

Note 14 – Inventories

Inventories, net, as of December 31, 2022 and 2021 were as follows:

	2022	2021
Raw materials and supplies	\$ 151,105	\$ 129,382
Work in process, finished goods and reserves	133,743	135,149
Total inventories, net	<u>\$ 284,848</u>	<u>\$ 264,531</u>

Note 15 – Property, Plant and Equipment

Property, plant and equipment as of December 31, 2022 and 2021 were as follows:

	2022	2021
Land	\$ 29,010	\$ 30,793
Building and improvements	138,759	134,313
Machinery and equipment	240,097	252,779
Construction in progress	20,324	16,459
Property, plant and equipment, at cost	428,190	434,344
Less: accumulated depreciation	(229,595)	(236,824)
Total property, plant and equipment, net	<u>\$ 198,595</u>	<u>\$ 197,520</u>

As of December 31, 2022, PP&E includes \$0.6 million of finance lease assets and future minimum lease payments. Land with an aggregate book value of approximately \$0.6 million is held-for-sale as of December 31, 2022 and is recorded in Prepaid expenses and other current assets on the Company's Consolidated Balance Sheets.

Note 16 – Goodwill and Other Intangible Assets

Changes in the carrying amount of goodwill for the years ended December 31, 2022 and 2021 were as follows:

	Americas	EMEA	Asia/Pacific	Global Specialty Businesses	Total
Balance as of December 31, 2020	\$ 213,242	\$ 140,162	\$ 158,090	\$ 119,718	\$ 631,212
Goodwill additions	1,490	3,380	1,308	2,624	8,802
Currency translation and other adjustments	(709)	(8,022)	3,060	(3,149)	(8,820)
Balance as of December 31, 2021	214,023	135,520	162,458	119,193	631,194
Goodwill additions (reductions)	1,853	251	—	(59)	2,045
Goodwill impairments	—	(93,000)	—	—	(93,000)
Currency translation and other adjustments	23	(8,204)	(12,083)	(4,967)	(25,231)
Balance as of December 31, 2022	<u>\$ 215,899</u>	<u>\$ 34,567</u>	<u>\$ 150,375</u>	<u>\$ 114,167</u>	<u>\$ 515,008</u>

As a result of the Company's new organizational structure effective January 1, 2023, the Company reallocated goodwill previously held by the former Global Specialty Businesses segment to the remaining business segments as of January 1, 2023.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
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Gross carrying amounts and accumulated amortization for definite-lived intangible assets as of December 31, 2022 and 2021 were as follows:

	Gross Carrying Amount		Accumulated Amortization		Net Book Value	
	2022	2021	2022	2021	2022	2021
Customer lists and rights to sell	\$ 831,600	\$ 853,122	\$ 191,286	\$ 147,858	\$ 640,314	\$ 705,264
Trademarks, formulations and product technology	158,564	163,974	46,281	38,747	112,283	125,227
Other	7,576	6,309	6,390	5,900	1,186	4,409
Total definite-lived intangible assets	<u>\$ 997,740</u>	<u>\$ 1,023,405</u>	<u>\$ 243,957</u>	<u>\$ 192,505</u>	<u>\$ 753,783</u>	<u>\$ 830,900</u>

The Company recorded \$57.5 million, \$59.9 million and \$55.9 million of amortization expense during the years ended December 31, 2022, 2021 and 2020, respectively. Amortization is recorded within SG&A in the Company's Consolidated Statements of Operations. Estimated annual aggregate amortization expense for the subsequent five years is as follows:

For the year ended December 31, 2023	\$ 57,822
For the year ended December 31, 2024	57,218
For the year ended December 31, 2025	56,466
For the year ended December 31, 2026	56,194
For the year ended December 31, 2027	55,897

The Company has four indefinite-lived intangible assets totaling \$189.1 million as of December 31, 2022, including \$188.0 million of indefinite-lived intangible assets for trademarks and tradename associated with the Combination. Comparatively, the Company had four indefinite-lived intangible assets for trademarks and tradename totaling \$196.9 million as of December 31, 2021. During the first quarter of 2020, the Company recorded a \$38.0 million non-cash impairment charge to write down the value of certain indefinite-lived intangible assets related to certain acquired Houghton trademarks and tradenames and is primarily the result of the negative impacts of COVID-19 on their estimated fair values.

The Company completes its annual goodwill and indefinite-lived intangible asset impairment test during the fourth quarter of each year, or more frequently if triggering events indicate a possible impairment in one or more of its reporting units. The Company completed its annual impairment assessment as of October 1, 2022 and concluded no impairment charge was warranted. The Company continually evaluates financial performance, economic conditions and other recent developments in assessing if a triggering event indicates that the carrying values of goodwill, indefinite-lived, or long-lived assets are impaired.

The Company continues to monitor various financial, economic and geopolitical conditions impacting the Company, including the ongoing Russia-Ukraine war and the Company's decision to cease operations in Russia, continued raw material cost escalation, supply chain constraints and disruptions, as well as rising interest rates and the Company's cost of capital, among other factors. During the third quarter of 2022, the Company concluded that the escalation of these events adversely impacted the Company's EMEA reporting unit's financial performance and represented a triggering event. As a result of this conclusion, the Company completed an interim impairment assessment for its EMEA reporting unit, as well as the related asset group, during the third quarter of 2022. The Company concluded that the undiscounted cash flows exceeded the carrying value of the long-lived assets, and it was not more likely than not that an impairment exists. In completing a quantitative goodwill impairment test, the Company compares the reporting unit's fair value, primarily based on future discounted cash flows, to its carrying value in order to determine if an impairment charge is warranted. The estimates of future discounted cash flows involve considerable judgment and are based upon certain significant assumptions including the weighted average cost of capital ("WACC") as well as projected EBITDA, which includes assumptions related to revenue growth rates, gross margin levels and operating expenses. The estimated fair value of the EMEA reporting unit as of this interim impairment assessment exceeded its carrying value and the Company concluded no impairment was warranted.

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
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During the fourth quarter of 2022, subsequent to the Company completing its annual impairment test as of October 1, 2022, the Company concluded that the continued negative impacts of the aforementioned events, most notably the continued rise in interest rates which led to an increase in the Company's cost of capital, as well as lower than expected financial performance driven by the ongoing lag in margin recovery represented an additional triggering event for the Company's EMEA reporting unit and the associated goodwill, as well as the related asset group. As a result of this conclusion, the Company completed an interim impairment assessment as of December 31, 2022 for its EMEA reporting unit and the related asset group. The Company concluded that the undiscounted cash flows exceeded the carrying value of the long-lived assets, and it was not more likely than not that an impairment exists. In completing a quantitative goodwill impairment test, the Company compares the reporting unit's fair value, primarily based on future discounted cash flows, to its carrying value in order to determine if an impairment charge is warranted. The estimates of future discounted cash flows involve considerable judgment and are based upon certain significant assumptions including the WACC as well as projected EBITDA, which includes assumptions related to revenue growth rates, gross margin levels and operating expenses. As a result of the impact of financial, economic, and geopolitical conditions driving a decrease in EMEA earnings in the current year, the impact of the current year decline on projected future earnings, as well as an increase in the WACC assumption utilized in this fourth quarter interim quantitative impairment assessment, the Company concluded that the estimated fair value of the EMEA reporting unit was less than its carrying value. As a result, a non-cash impairment charge of \$93.0 million to write down the carrying value of the EMEA reporting unit Goodwill to its estimated fair values was recorded in the fourth quarter of 2022.

Notwithstanding the results of the Company's annual and trigger based interim impairment assessments during 2022 and the goodwill impairment charge taken in the fourth quarter of 2022, if the Company is unable to successfully implement actions aimed at more than offsetting raw material costs and ongoing inflationary pressures and the financial performance of the EMEA reporting unit declines further, or interest rates continue to rise and this leads to an increase in the cost of capital, then it is possible these financial, economic and geopolitical conditions could result in another triggering event for the EMEA reporting unit in the future and could potentially lead to an additional impairment of the EMEA reporting unit's remaining goodwill or other indefinite-lived or long-lived assets.

Note 17 – Investments in Associated Companies

As of December 31, 2022, the Company held a 50% investment in and had significant influence over Nippon Quaker Chemical, Ltd. ("Nippon Japan"), Kelko Quaker Chemical, S.A. ("Kelko Panama") and Houghton Korea, and held a 32% investment in and had significant influence over Primex, Ltd. ("Primex").

The carrying amount of the Company's equity investments as of December 31, 2022 was \$88.2 million, which includes investments of \$62.9 million in Houghton Korea; \$18.1 million in Primex; \$6.6 million in Nippon Japan; and \$0.6 million in Kelko Panama.

The Company also has a 50% equity interest in Kelko Venezuela. Due to heightened foreign exchange controls, deteriorating economic circumstances and other restrictions in Venezuela, during 2018 the Company concluded that it no longer had significant influence over this affiliate. Prior to this determination, the Company historically accounted for this affiliate under the equity method. As of December 31, 2022 and 2021, the Company had no remaining carrying value for its investment in Kelko Venezuela.

The following table is a summary of equity income in associated companies by investment for the years ending December 31, 2022, 2021 and 2020:

	Year Ended December 31,		
	2022	2021	2020
Houghton Korea	\$ 2,644	\$ 3,808	\$ 5,241
Nippon Japan	323	461	853
Kelko Panama	425	154	107
Grindaix (1)	—	(37)	—
Primex	(1,427)	4,993	1,151
Total equity in net income of associated companies	<u>\$ 1,965</u>	<u>\$ 9,379</u>	<u>\$ 7,352</u>

(1) In February 2021, the Company acquired a 38% ownership interest in Grindaix. From that date through September 2021 when the Company purchased the remaining interest of Grindaix, the Company accounted for its 38% interest under the equity method of accounting and recorded equity in net income of associated companies. See Note 2 of Notes to Consolidated Financial Statements.

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Note 18 – Other Non-Current Assets

Other non-current assets as of December 31, 2022 and 2021 were as follows:

	2022	2021
Pension assets (See Note 21)	\$ 8,639	\$ 7,916
Uncertain tax positions (See Note 10)	5,803	6,931
Debt issuance costs (See Note 20)	4,305	4,267
Indemnification assets	3,909	6,630
Supplemental retirement income program (See Notes 21 and 24)	2,114	2,269
Other	2,969	2,946
Total other non-current assets	\$ 27,739	\$ 30,959

As of December 31, 2022 and 2021, indemnification assets relates to certain Houghton foreign subsidiaries for which the Company expects it will incur additional tax amounts which are subject to indemnification under the terms of the Combination share and purchase agreement. A portion of these indemnification assets have a corresponding uncertain tax position recorded in other non-current liabilities. As of December 31, 2022 and 2021, one of the Company's foreign pension plan's fair value of plan assets exceeded its gross benefit obligation and was therefore over-funded, which is represented by the line Pension assets in the table above. See Notes 10, 12, 21 and 22 of Notes to Consolidated Financial Statements.

Note 19 – Other Accrued Liabilities

Other accrued liabilities as of December 31, 2022 and 2021 were as follows:

	2022	2021
Non-income taxes	\$ 25,525	\$ 23,725
Current income taxes payable (See Note 10)	12,966	16,642
Short-term lease liabilities (See Note 6)	12,024	9,976
Selling expenses and freight accruals	9,822	11,695
Customer advances and sales return reserves	6,585	7,965
Professional fees, legal, and acquisition-related accruals	5,415	12,264
Accrued interest (See Note 20)	2,749	2,129
Interest rate swap (See Note 25)	—	1,782
Other	11,787	9,439
Total other accrued liabilities	\$ 86,873	\$ 95,617

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Note 20 – Debt

Debt as of December 31, 2022 and 2021 includes the following:

	As of December 31, 2022		As of December 31, 2021	
	Interest Rate	Outstanding Balance	Interest Rate	Outstanding Balance
Credit Facilities:				
Original Revolver	—%	\$ —	1.62%	\$ 211,955
Original U.S. Term Loan	—%	—	1.65%	540,000
Original EURO Term Loan	—%	—	1.50%	137,616
Amended Revolver	5.17%	195,673	—%	—
Amended U.S. Term Loan	5.70%	596,250	—%	—
Amended EURO Term Loan	1.50%	151,572	—%	—
Industrial development bonds	5.26%	10,000	5.26%	10,000
Bank lines of credit and other debt obligations	Various	1,303	Various	1,777
Total debt		\$ 954,798		\$ 901,348
Less: debt issuance costs		(1,992)		(8,001)
Less: short-term and current portion of long-term debts		(19,245)		(56,935)
Total long-term debt		\$ 933,561		\$ 836,412

Credit facilities

The Company, its wholly owned subsidiary, Quaker Chemical B.V., as borrowers, Bank of America, N.A., as administrative agent, U.S. Dollar swing line lender and letter of credit issuer, and the other lenders party thereto, entered into a credit agreement on August 1, 2019, as amended (the “Original Credit Facility”). The Original Credit Facility was comprised of a \$400.0 million multicurrency revolver (the “Original Revolver”), a \$600.0 million term loan (the “Original U.S. Term Loan”), each with the Company as borrower, and a \$150.0 million (as of August 1, 2019) Euro equivalent term loan (the “Original EURO Term Loan”) with Quaker Chemical B.V., a Dutch subsidiary of the Company as borrower, each with a five year term, maturing in August 2024.

During June 2022, the Company, and its wholly owned subsidiary, Quaker Houghton B.V., as borrowers, Bank of America, N.A., as administrative agent, U.S. Dollar swing line lender and letter of credit issuer, Bank of America Europe Designated Active Company, as Euro Swing Line Lender, certain guarantors and other lenders entered into an amendment to the Original Credit Facility (the “Amended Credit Facility”). The Amended Credit Facility established (A) a new \$150.0 million Euro equivalent senior secured term loan (the “Amended Euro Term Loan”), (B) a new \$600.0 million senior secured term loan (the “Amended U.S. Term Loan”), and (C) a new \$500.0 million senior secured revolving credit facility (the “Amended Revolver”). The Company has the right to increase the amount of the Amended Credit Facility by an aggregate amount not to exceed the greater of \$300.0 million or 100% of Consolidated EBITDA, subject to certain conditions including the agreement to provide financing by any lender providing such increase. In addition, the Amended Credit Facility also:

- (i) eliminated the requirement that material foreign subsidiaries must guaranty the Original Euro Term Loan;
- (ii) replaced the U.S. Dollar borrowings reference rate from LIBOR to SOFR;
- (iii) extended the maturity date of the Original Credit Facility from August 2024 to June 2027; and
- (iv) effected certain other changes to the Original Credit Facility as set forth in the Amended Credit Facility.

The Company used the proceeds of the Amended Credit Facility to repay all outstanding loans under the Original Credit Facility, unpaid accrued interest and fees on the closing date under the Original Credit Facility and certain expenses and fees. U.S. Dollar-denominated borrowings under the Amended Credit Facility bear interest, at the Company’s election, at the base rate or term SOFR plus an applicable rate ranging from 1.00% to 1.75% for term SOFR loans and from 0.00% to 0.75% for base rate loans, depending upon the Company’s consolidated net leverage ratio. Loans based on term SOFR also include a spread adjustment equal to 0.10% per annum. Borrowings under the Amended Credit Facility denominated in currencies other than U.S. Dollars bear interest at the alternative currency term rate plus the applicable rate ranging from 1.00% to 1.75%

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The Amended Credit Facility contains affirmative and negative covenants, financial covenants and events of default, including without limitation restrictions on (a) the incurrence of additional indebtedness; (b) investments in and acquisitions of other businesses, lines of business and divisions; (c) the making of dividends or capital stock purchases; and (d) dispositions of assets. Dividends and share repurchases are permitted in annual amounts not exceeding the greater of \$75 million annually and 25% of consolidated EBITDA if there is no default. If the consolidated net leverage ratio is less than 2.50 to 1.00, then the Company is no longer subject to restricted payments.

Financial covenants contained in the Amended Credit Facility include a consolidated interest coverage ratio test and a consolidated net leverage ratio test. The consolidated net leverage ratio at the end of a quarter may not be greater than 4.00 to 1.00, subject to a permitted increase during a four-quarter period after certain acquisitions. The Company has the option of replacing the consolidated net leverage ratio test with a consolidated senior net leverage ratio test if the Company issues certain types of unsecured notes, subject to certain limitations. Events of default in the Amended Credit Facility include without limitation defaults for non-payment, breach of representations and warranties, non-performance of covenants, cross-defaults, insolvency, and a change of control in certain circumstances. The occurrence of an event of default under the Amended Credit Facility could result in all loans and other obligations becoming immediately due and payable and the Amended Credit Facility being terminated. As of December 31, 2022 and December 31, 2021, the Company was in compliance with all of the Amended and Original Credit Facility covenants.

The weighted average variable interest rate incurred on the outstanding borrowings under the Original Credit Facility and the Amended Credit Facility during the twelve months ended December 31, 2022 was approximately 3.0%. As of December 31, 2022, the interest rate on the outstanding borrowings under the Amended Credit Facility was approximately 4.9%. In addition to paying interest on outstanding principal under the Original Credit Facility, the Company was required to pay a commitment fee ranging from 0.2% to 0.3% depending on the Company's consolidated net leverage ratio under the Original Revolver in respect of the unutilized commitments thereunder. As part of the Amended Credit Facility, the Company is required to pay a commitment fee ranging from 0.150% to 0.275% related to unutilized commitments under the Amended Revolver, depending on the Company's consolidated net leverage ratio. The Company had unused capacity under the Amended Revolver of approximately \$301.1 million, which is net of bank letters of credit of approximately \$3 million, as of December 31, 2022.

The Company previously capitalized \$23.7 million of certain third-party debt issuance costs in connection with executing the Original Credit Facility. Approximately \$15.5 million of the capitalized costs were attributed to the Original Term Loans and recorded as a direct reduction of Long-term debt on the Company's Consolidated Balance Sheet. Approximately \$8.3 million of the capitalized costs were attributed to the Original Revolver and recorded within Other assets on the Company's Consolidated Balance Sheet. These capitalized costs are being amortized into interest expense over the five year term of the Original Credit Facility. Prior to executing the Amended Credit Facility, as of December 31, 2021, the Company had \$8.0 million of debt issuance costs recorded as a reduction of Long-term debt attributable to the Original Credit Facility and \$4.3 million of debt issuance costs recorded within Other assets attributable to the Original Credit Facility.

In connection with executing the Amended Credit Facility, the Company recorded a loss on extinguishment of debt of approximately \$6.8 million which includes the write-off of certain previously unamortized deferred financing costs as well as a portion of the third-party and creditor debt issuance costs incurred to execute the Amended Credit Facility. Also in connection with executing the Amended Credit Facility, during the second quarter of 2022, the Company capitalized \$2.2 million of certain third-party and creditor debt issuance costs. Approximately \$0.7 million of the capitalized costs were attributed to the Amended Euro Term Loan and Amended U.S. Term Loan. These costs were recorded as a direct reduction of Long-term debt on the Consolidated Balance Sheet. Approximately \$1.5 million of the capitalized costs were attributed to the Amended Revolver and recorded within Other assets on the Consolidated Balance Sheet. These capitalized costs, as well as the previously capitalized costs that were not written off will collectively be amortized into Interest expense over the five year term of the Amended Credit Facility. As of December 31, 2022, the Company had \$2.0 million of debt issuance costs recorded as a reduction of Long-term debt on the Consolidated Balance Sheet and \$4.3 million of debt issuance costs recorded within Other assets on the Consolidated Balance Sheet.

The Original Credit Facility required the Company to fix its variable interest rates on at least 20% of its total Term Loans. In order to satisfy this requirement as well as to manage the Company's exposure to variable interest rate risk associated with the Credit Facility, in November 2019, the Company entered into \$170.0 million notional amounts of three year interest rate swaps at a base rate of 1.64% plus an applicable margin as provided in the Credit Facility, based on the Company's consolidated net leverage ratio. At the time the Company entered into the swaps, the aggregate interest rate on the swaps, including the fixed base rate plus an applicable margin, was 3.1%. The Amended Credit Facility does not require the Company to fix variable interest rates on any portion of its borrowings. In October 2022, the Company's interest rate swap contracts expired. Upon expiration, the Company received a cash payment from the counterparties of \$0.2 million. See Note 25 of Notes to Consolidated Financial Statements.

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Industrial development bonds

As of December 31, 2022 and 2021, the Company had fixed rate, industrial development authority bonds totaling \$10.0 million in principal amount due in 2028. These bonds have similar covenants to the Amended Credit Facility noted above.

Bank lines of credit and other debt obligations

The Company has certain unsecured bank lines of credit and discounting facilities in certain foreign subsidiaries, which are not collateralized. The Company's other debt obligations primarily consist of certain domestic and foreign low interest rate or interest-free municipality-related loans, local credit facilities of certain foreign subsidiaries and capital lease obligations. Total unused capacity under these arrangements as of December 31, 2022, was approximately \$35 million.

In addition to the bank letters of credit described in the "Credit facilities" subsection above, the Company's only other off-balance sheet arrangements include certain financial and other guarantees. The Company's total bank letters of credit and guarantees outstanding as of December 31, 2022 were approximately \$5 million.

The Company incurred the following debt related expenses included within Interest expense, net, in the Consolidated Statements of Operations:

	Year Ended December 31,		
	2022	2021	2020
Interest expense	\$ 33,691	\$ 19,089	\$ 23,552
Amortization of debt issuance costs	2,942	4,749	4,749
Total	\$ 36,633	\$ 23,838	\$ 28,301

Based on the variable interest rates associated with the Amended Credit Facility and the Original Credit Facility, as of December 31, 2022 and 2021, the amounts at which the Company's total debt were recorded are not materially different from their fair market value.

At December 31, 2022, annual maturities on long-term borrowings maturing in the next five fiscal years (excluding the reduction to long-term debt attributed to capitalized and unamortized debt issuance costs) are as follows:

For the year ended December 31, 2023	\$ 19,063
For the year ended December 31, 2024	23,740
For the year ended December 31, 2025	37,745
For the year ended December 31, 2026	37,705
For the year ended December 31, 2027	825,964
Total maturities on debt in the next five fiscal years	944,217

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Note 21 – Pension and Other Postretirement Benefits

The following table shows the funded status of the Company’s plans’ reconciled with amounts reported in the Consolidated Balance Sheets as of December 31, 2022 and 2021:

	Pension Benefits						Other Post-Retirement Benefits	
	2022			2021			2022	2021
	Foreign	U.S.	Total	Foreign	U.S.	Total	U.S.	U.S.
Change in benefit obligation								
Gross benefit obligation at beginning of year	\$ 228,752	\$ 103,420	\$ 332,172	\$ 247,675	\$ 109,969	\$ 357,644	\$ 2,010	\$ 3,234
Service cost	465	47	512	698	547	1,245	—	1
Interest cost	3,079	2,145	5,224	2,594	1,737	4,331	37	27
Employee contributions	20	—	20	71	—	71	—	—
Effect of plan amendments	303	—	303	—	—	—	(2)	(78)
Curtailement gain	207	—	207	—	—	—	—	—
Plan settlements	(1,726)	—	(1,726)	(541)	—	(541)	—	—
Benefits paid	(5,343)	(5,838)	(11,181)	(6,869)	(5,064)	(11,933)	(176)	(182)
Plan expenses and premiums paid	(66)	—	(66)	(74)	—	(74)	—	—
Transfer in of business acquisition	—	—	—	231	—	231	—	—
Actuarial (gain) loss	(77,244)	(20,688)	(97,932)	(4,160)	(3,769)	(7,929)	(263)	(992)
Translation differences and other	(17,893)	—	(17,893)	(10,873)	—	(10,873)	—	—
Gross benefit obligation at end of year	<u>\$ 130,554</u>	<u>\$ 79,086</u>	<u>\$ 209,640</u>	<u>\$ 228,752</u>	<u>\$ 103,420</u>	<u>\$ 332,172</u>	<u>\$ 1,606</u>	<u>\$ 2,010</u>

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
(Dollars in thousands, except per share amounts, unless otherwise stated)

	Pension Benefits						Other Post-Retirement Benefits	
	2022			2021			2022	2021
	Foreign	U.S.	Total	Foreign	U.S.	Total	U.S.	U.S.
Change in plan assets								
Fair value of plan assets at beginning of year	\$ 216,886	\$ 77,680	\$ 294,566	\$ 228,789	\$ 73,481	\$ 302,270	\$ —	\$ —
Actual return on plan assets	(65,396)	(14,871)	(80,267)	915	7,201	8,116	—	—
Employer contributions	3,241	2,620	5,861	4,289	2,063	6,352	176	182
Employee contributions	20	—	20	71	—	71	—	—
Plan settlements	(1,726)	—	(1,726)	(541)	—	(541)	—	—
Benefits paid	(5,343)	(5,838)	(11,181)	(6,869)	(5,065)	(11,934)	(176)	(182)
Plan expenses and premiums paid	(66)	—	(66)	(74)	—	(74)	—	—
Translation differences	(17,672)	—	(17,672)	(9,694)	—	(9,694)	—	—
Fair value of plan assets at end of year	<u>\$ 129,944</u>	<u>\$ 59,591</u>	<u>\$ 189,535</u>	<u>\$ 216,886</u>	<u>\$ 77,680</u>	<u>\$ 294,566</u>	<u>\$ —</u>	<u>\$ —</u>
Net benefit obligation recognized	<u>\$ (610)</u>	<u>\$ (19,495)</u>	<u>\$ (20,105)</u>	<u>\$ (11,866)</u>	<u>\$ (25,740)</u>	<u>\$ (37,606)</u>	<u>\$ (1,606)</u>	<u>\$ (2,010)</u>
Amounts recognized in the balance sheet consist of:								
Non-current assets	\$ 8,639	\$ —	\$ 8,639	\$ 7,916	\$ —	\$ 7,916	\$ —	\$ —
Current liabilities	(210)	(1,128)	(1,338)	(191)	(1,137)	(1,328)	(222)	(220)
Non-current liabilities	(9,039)	(18,367)	(27,406)	(19,591)	(24,603)	(44,194)	(1,384)	(1,790)
Net benefit obligation recognized	<u>\$ (610)</u>	<u>\$ (19,495)</u>	<u>\$ (20,105)</u>	<u>\$ (11,866)</u>	<u>\$ (25,740)</u>	<u>\$ (37,606)</u>	<u>\$ (1,606)</u>	<u>\$ (2,010)</u>
Amounts not yet reflected in net periodic benefit costs and included in accumulated other comprehensive loss:								
Prior service (cost) credit	(333)	(36)	(369)	(22)	43	21	16	46
Accumulated (loss) gain	(10,387)	2,532	(7,855)	(19,163)	(9,763)	(28,926)	1,218	1,034
AOCI	(10,720)	2,496	(8,224)	(19,185)	(9,720)	(28,905)	1,234	1,080
Cumulative employer contributions in excess of or (below) net periodic benefit cost	10,110	(21,991)	(11,881)	7,319	(16,020)	(8,701)	(2,840)	(3,090)
Net benefit obligation recognized	<u>\$ (610)</u>	<u>\$ (19,495)</u>	<u>\$ (20,105)</u>	<u>\$ (11,866)</u>	<u>\$ (25,740)</u>	<u>\$ (37,606)</u>	<u>\$ (1,606)</u>	<u>\$ (2,010)</u>

The accumulated benefit obligation for all defined benefit pension plans was \$204.5 million (\$79.1 million U.S. and \$125.4 million Foreign) and \$321.5 million (\$103.4 million U.S. and approximately \$218.1 million Foreign) as of December 31, 2022 and 2021, respectively.

Information for pension plans with an accumulated benefit obligation in excess of plan assets:

	2022			2021		
	Foreign	U.S.	Total	Foreign	U.S.	Total
Accumulated benefit obligation	5,983	79,086	85,069	128,268	103,420	231,688
Fair value of plan assets	1,842	59,591	61,433	119,181	77,680	196,861

Information for pension plans with a projected benefit obligation in excess of plan assets:

	2022			2021		
	Foreign	U.S.	Total	Foreign	U.S.	Total
Projected benefit obligation	\$ 71,318	\$ 79,086	\$ 150,404	\$ 138,963	\$ 103,420	\$ 242,383
Fair value of plan assets	61,805	59,591	121,396	119,181	77,680	196,861

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NOTES TO CONSOLIDATED FINANCIAL STATEMENTS - Continued
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Components of net periodic benefit costs – pension plans:

	2022			2021		
	Foreign	U.S.	Total	Foreign	U.S.	Total
Service cost	\$ 465	\$ 47	\$ 512	\$ 698	\$ 547	\$ 1,245
Interest cost	3,079	2,145	5,224	2,594	1,737	4,331
Expected return on plan assets	(4,472)	(3,509)	(7,981)	(4,686)	(3,611)	(8,297)
Settlement loss (gain)	(71)	—	(71)	35	—	35
Curtailement charge	207	—	207	—	—	—
Actuarial loss amortization	658	323	981	996	2,252	3,248
Prior service cost (credit) amortization	3	7	10	3	7	10
Net periodic benefit (income) cost	\$ (131)	\$ (987)	\$ (1,118)	\$ (360)	\$ 932	\$ 572

	2020		
	Foreign	U.S.	Total
Service cost	\$ 4,340	\$ 491	\$ 4,831
Interest cost	3,416	2,923	6,339
Expected return on plan assets	(4,262)	(4,810)	(9,072)
Settlement (gain) loss	(88)	22,667	22,579
Curtailement charge	(1,155)	—	(1,155)
Actuarial loss amortization	886	2,110	2,996
Prior service credit amortization	(167)	—	(167)
Net periodic benefit cost	\$ 2,970	\$ 23,381	\$ 26,351

Other changes recognized in other comprehensive income – pension plans:

	2022			2021		
	Foreign	U.S.	Total	Foreign	U.S.	Total
Net (gain) loss arising during the period	\$ (7,008)	\$ (3,555)	\$ (10,563)	\$ (388)	\$ (448)	\$ (836)
Settlement loss	—	(323)	(323)	(83)	(2,252)	(2,335)
Prior service (cost) credit	303	(7)	296	—	(7)	(7)
Actuarial (loss) gain	(587)	1,247	660	(954)	(6,925)	(7,879)
Curtailement Recognition	(3)	—	(3)	(3)	—	(3)
Effect of exchange rates on amounts included in AOCI	(1,169)	—	(1,169)	(1,390)	—	(1,390)
Total recognized in other comprehensive (income) loss	(8,464)	(2,638)	(11,102)	(2,818)	(9,632)	(12,450)
Total recognized in net periodic benefit cost and other comprehensive (income) loss	\$ (8,595)	\$ (3,625)	\$ (12,220)	\$ (3,178)	\$ (8,700)	\$ (11,878)

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	2020		
	Foreign	U.S.	Total
Net (gain) loss arising during period	\$ (1,594)	\$ 1,536	\$ (58)
Recognition of amortization in net periodic benefit cost			
Settlement loss	(39)	(22,667)	(22,706)
Prior service credit	1,325	50	1,375
Actuarial (loss) gain	(758)	3,967	3,209
Curtailment Recognition	(3)	—	(3)
Effect of exchange rates on amounts included in AOCI	1,535	—	1,535
Total recognized in other comprehensive loss	466	(17,114)	(16,648)
Total recognized in net periodic benefit cost and other comprehensive loss	<u>\$ 3,436</u>	<u>\$ 6,267</u>	<u>\$ 9,703</u>

Components of net periodic benefit costs – other postretirement plan:

	2022	2021	2020
Service cost	\$ —	\$ 1	\$ 5
Interest cost	37	27	77
Actuarial loss amortization	(79)	(82)	(5)
Prior service credit amortization	(32)	(31)	—
Net periodic benefit costs	<u>\$ (74)</u>	<u>\$ (85)</u>	<u>\$ 77</u>

Other changes recognized in other comprehensive income – other postretirement benefit plans:

	2022	2021	2020
Net (gain) loss arising during period	\$ (263)	\$ (992)	\$ (864)
Recognition of amortizations in net periodic benefit cost	(2)	(78)	—
Prior service credit	32	31	—
Actuarial gain amortization	79	82	5
Total recognized in other comprehensive (income) loss	(154)	(957)	(859)
Total recognized in net periodic benefit cost and other comprehensive (income) loss	<u>\$ (228)</u>	<u>\$ (1,042)</u>	<u>\$ (782)</u>

Weighted-average assumptions used to determine benefit obligations as of December 31, 2022 and 2021:

	Pension Benefits		Other Postretirement Benefits	
	2022	2021	2022	2021
U.S. Plans:				
Discount rate	5.21%	2.58%	5.14%	2.45%
Rate of compensation increase	N/A	N/A	N/A	N/A
Foreign Plans:				
Discount rate	6.29%	1.71%	N/A	N/A
Rate of compensation increase	3.93%	2.21%	N/A	N/A

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Weighted-average assumptions used to determine net periodic benefit costs for the years ended December 31, 2022, 2021 and 2020:

	Pension Benefits			Other Postretirement Benefits		
	2022	2021	2020	2022	2021	2020
U.S. Plans:						
Discount rate	2.67 %	2.67 %	3.11 %	2.45 %	1.90 %	2.99 %
Expected long-term return on plan assets	5.75 %	5.75 %	6.50 %	N/A	N/A	N/A
Rate of compensation increase	N/A	6.00 %	6.00 %	N/A	N/A	N/A
Foreign Plans:						
Discount rate	3.97 %	1.38 %	2.30 %	N/A	N/A	N/A
Expected long-term return on plan assets	2.26 %	2.06 %	2.20 %	N/A	N/A	N/A
Rate of compensation increase	3.21 %	2.52 %	2.79 %	N/A	N/A	N/A

The long-term rates of return on assets were selected from within the reasonable range of rates determined by (a) historical real returns for the asset classes covered by the investment policy and (b) projections of inflation over the long-term period during which benefits are payable to plan participants. See Note 1 of Notes to Consolidated Financial Statements for further information.

Assumed health care cost trend rates as of December 31, 2022, 2021 and 2020:

	2022	2021	2020
Health care cost trend rate for next year	5.60 %	5.65 %	5.70 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.00 %	4.00 %	4.50 %
Year that the rate reaches the ultimate trend rate	2047	2046	2037

Plan Assets and Fair Value

The Company's pension plan target asset allocation and the weighted-average asset allocations as of December 31, 2022 and 2021 by asset category were as follows:

Asset Category	Target	2022	2021
U.S. Plans			
Equity securities	32 %	32 %	46 %
Debt securities	60 %	60 %	48 %
Other	8 %	8 %	6 %
Total	100 %	100 %	100 %
Foreign Plans			
Equity securities	15 %	8 %	36 %
Debt securities	79 %	79 %	43 %
Other	6 %	13 %	21 %
Total	100 %	100 %	100 %

As of December 31, 2022 and 2021, "Other" consisted principally of cash and cash equivalents, and investments in real estate funds.

The following is a description of the valuation methodologies used for the investments measured at fair value, including the general classification of such instruments pursuant to the valuation hierarchy, where applicable:

Cash and Cash Equivalents

Cash and cash equivalents consist of cash and money market funds and are classified as Level 1 investments.

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Commingled Funds

Investments in the U.S. pooled separate accounts consist primarily of mutual funds, each of which follows a separate investment strategy, and are valued based on the reported unit value at year end. Foreign pension plan commingled funds represent pooled institutional investments, including primarily collective investment trusts. These commingled funds are not available on an exchange or in an active market and these investments are valued using their net asset value ("NAV"), which is generally based on the underlying asset values of the investments held in the trusts. As of December 31, 2022, the foreign pension plan commingled funds included approximately 34 percent of investments in equity securities, 50 percent of investments in fixed income securities, and 16 percent of other non-related investments, primarily real estate. As of December 31, 2021, the foreign pension plan commingled funds included approximately 35 percent of investments in equity securities, 51 percent of investments in fixed income securities, and 14 percent of other non-related investments, primarily real estate.

Pooled Separate Accounts

Investments in the U.S. pension plan pooled separate accounts consist of annuity contracts and are valued based on the reported unit value at year end. Units of the pooled separate account are not traded on an exchange or in an active market; however, valuation is based on the underlying investments of each pooled separate account and are classified as Level 2 investments. As of December 31, 2022, the U.S. pension plan pooled separate accounts included approximately 35 percent of investments in equity securities and 65 percent of investments in fixed income securities.

Fixed Income Government Securities

Investments in foreign pension plans fixed income government securities were valued using third party pricing services which are based on a combination of quoted market prices on an exchange in an active market as well as proprietary pricing models and inputs using observable market data and are classified as Level 2 investments.

Insurance Contract

Investments in the foreign pension plan insurance contract are valued at the highest value available for the Company at year end, either the reported cash surrender value of the contract or the vested benefit obligation. Both the cash surrender value and the vested benefit obligation are determined based on unobservable inputs, which are contractually or actuarially determined, regarding returns, fees, the present value of the future cash flows of the contract and benefit obligations. The contract is classified as a Level 3 investment.

Diversified Equity Securities - Registered Investment Companies

Investments in the foreign pension plans diversified equity securities of registered investment companies are based upon the quoted redemption value of shares in the fund owned by the plan at year end. The shares of the fund are not available on an exchange or in an active market; however, the fair value is determined based on the underlying investments in the fund as traded on an exchange in an active market and are classified as Level 2 investments.

Fixed Income – Foreign Registered Investment Companies

Investments in the foreign pension plans fixed income securities of foreign registered investment companies are based upon the quoted redemption value of shares in the fund owned by the plan at year end. The shares of the fund are not available on an exchange or in an active market; however, the fair value is determined based on the underlying investments in the fund as traded on an exchange in an active market and are classified as Level 2 investments.

Diversified Investment Fund - Registered Investment Companies

Investments in the foreign pension plan diversified investment fund of registered investment companies are based upon the quoted redemption value of shares in the fund owned by the plan at year end. This fund is not available on an exchange or in an active market and this investment is valued using its NAV, which is generally based on the underlying asset values of the investments held. As of December 31, 2021, the diversified investment funds included approximately 62 percent of investments in equity securities, 20 percent of investments in fixed income securities, and 18 percent of other alternative investments. There were no such investments as of December 31, 2022.

Other – Alternative Investments

Investments in the foreign pension plans include certain other alternative investments such as inflation and interest rate swaps. These investments are valued based on unobservable inputs, which are contractually or actuarially determined, regarding returns, fees, the present value of future cash flows of the contract and benefit obligations. These alternative investments are classified as Level 3 investments.

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Real Estate

The U.S. and foreign pension plans' investment in real estate consists of investments in property funds. The funds' underlying investments consist of real property which are valued using unobservable inputs. These property funds are classified as a Level 3 investment.

As of December 31, 2022 and 2021, the U.S. and foreign plans' investments measured at fair value on a recurring basis were as follows:

U.S. Pension Assets	Total Fair Value	Fair Value Measurements at December 31, 2022		
		Using Fair Value Hierarchy		
		Level 1	Level 2	Level 3
Pooled separate accounts	\$ 54,596	\$ —	\$ 54,596	\$ —
Real estate	4,995	—	—	4,995
Subtotal U.S. pension plan assets in fair value hierarchy	\$ 59,591	\$ —	\$ 54,596	\$ 4,995
Total U.S. pension plan assets	<u>\$ 59,591</u>			
Foreign Pension Assets				
Cash and cash equivalents	\$ 4,923	\$ 4,923	\$ —	\$ —
Insurance contract	59,963	—	—	59,963
Diversified equity securities - registered investment companies	5,211	—	5,211	—
Fixed income – foreign registered investment companies	54,098	—	54,098	—
Real estate	3,907	—	—	3,907
Sub-total of foreign pension assets in fair value hierarchy	\$ 128,102	\$ 4,923	\$ 59,309	\$ 63,870
Commingled funds measured at NAV	1,842			
Total foreign pension assets	<u>\$ 129,944</u>			
Total pension assets in fair value hierarchy	<u>\$ 187,693</u>	<u>\$ 4,923</u>	<u>\$ 113,905</u>	<u>\$ 68,865</u>
Total pension assets measured at NAV	1,842			
Total pension assets	<u>\$ 189,535</u>			

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(Dollars in thousands, except per share amounts, unless otherwise stated)

U.S. Pension Assets	Total Fair Value	Fair Value Measurements at December 31, 2021		
		Using Fair Value Hierarchy		
		Level 1	Level 2	Level 3
Pooled separate accounts	\$ 72,721	\$ —	\$ 72,721	\$ —
Real estate	4,959	—	—	4,959
Subtotal U.S. pension plan assets in fair value hierarchy	\$ 77,680	\$ —	\$ 72,721	\$ 4,959
Total U.S. pension plan assets	\$ 77,680			
Foreign Pension Assets				
Cash and cash equivalents	\$ 1,989	\$ 1,989	\$ —	\$ —
Insurance contract	99,527	—	—	99,527
Diversified equity securities - registered investment companies	10,999	—	10,999	—
Fixed income – foreign registered investment companies	3,593	—	3,593	—
Fixed income government securities	35,339	—	35,339	—
Real estate	6,588	—	—	6,588
Other - alternative investments	6,979	—	—	6,979
Sub-total of foreign pension assets in fair value hierarchy	\$ 165,014	\$ 1,989	\$ 49,931	\$ 113,094
Commingled funds measured at NAV	2,300			
Diversified investment fund - registered investment companies measured at NAV	49,572			
Total foreign pension assets	\$ 216,886			
Total pension assets in fair value hierarchy	\$ 242,694	\$ 1,989	\$ 122,652	\$ 118,053
Total pension assets measured at NAV	51,872			
Total pension assets	\$ 294,566			

Certain investments that are measured at fair value using the NAV per share (or its equivalent) have not been classified in the fair value hierarchy. The fair value amounts presented for these investments in the preceding tables are intended to permit reconciliation of the fair value hierarchies to the line items presented in the statements of net assets available for benefits.

Changes in the fair value of the plans' Level 3 investments during the years ended December 31, 2022 and 2021 were as follows:

	Insurance Contract	Real Estate	Alternative Investments	Total
Balance as of December 31, 2020	\$ 112,920	\$ 9,775	\$ 10,638	\$ 133,333
Purchases	1,722	(78)	(334)	1,310
Settlements	(1,812)	—	—	(1,812)
Unrealized (losses) gains	(5,031)	1,926	(3,282)	(6,387)
Currency translation adjustment	(8,272)	(76)	(43)	(8,391)
Balance as of December 31, 2021	99,527	11,547	6,979	118,053
Purchases	(1,136)	(122)	(6,979)	(8,237)
Unrealized losses	(32,305)	(1,842)	—	(34,147)
Currency translation adjustment	(6,123)	(681)	—	(6,804)
Balance as of December 31, 2022	\$ 59,963	\$ 8,902	\$ —	\$ 68,865

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In 2018, the Company began the process of terminating a noncontributory U.S. pension plan. During 2019, the Company received a favorable termination determination letter from the I.R.S. and completed the termination during 2020. In order to terminate the plan in accordance with I.R.S. and Pension Benefit Guaranty Corporation requirements, the Company was required to fully fund the plan on a termination basis and the amount necessary to do so was approximately \$1.8 million, subject to final true up adjustments. In 2020, the Company finalized the amount of the liability and related annuity payments and received a refund in premium of approximately \$1.6 million. In addition, the Company recorded a non-cash pension settlement charge at plan termination of approximately \$22.7 million. This settlement charge included the immediate recognition into expense of the related unrecognized losses within AOCI on the balance sheet as of the plan termination date.

The Company contributes to a multiemployer defined benefit pension plan under terms of a collective bargaining union contract (the Cleveland Bakers and Teamsters Pension Fund, Employer Identification Number: 34-0904419-001). The expiration date of the collective bargaining contract is May 1, 2025. As of January 1, 2021, the last valuation date available for the multiemployer plan, total plan liabilities were approximately \$583 million. As of December 31, 2021, the multiemployer pension plan had total plan assets of approximately \$427 million. The Company's contribution rate to the multiemployer pension plan is specified in the collective bargaining union contract and contributions are made to the plan based on its union employee payroll. The Company contributed \$0.1 million during the year ended December 31, 2022. The Employee Retirement Income Security Act of 1974, as amended by the Multi-Employer Pension Plan Amendments Act of 1980, imposes certain contingent liabilities upon an employer who is a contributor to a multiemployer pension plan if the employer withdraws from the plan or the plan is terminated or experiences a mass withdrawal. While the Company may also have additional liabilities imposed by law as a result of its participation in the multiemployer defined benefit pension plan, there is no liability as of December 31, 2022.

The Pension Protection Act of 2006 (the "PPA") also added special funding and operational rules generally applicable to plan years beginning after 2007 for multiemployer plans with certain classifications based on a multitude of factors (including, for example, the plan's funded percentage, cash flow position and whether the plan is projected to experience a minimum funding deficiency). The plan to which the Company contributes is in "critical" status. Plans in the "critical" status classification must adopt measures to improve their funded status through a funding improvement or rehabilitation plan which may require additional contributions from employers (which may take the form of a surcharge on benefit contributions) and/or modifications to retiree benefits. The amount of additional funds that the Company may be obligated to contribute to the plan in the future cannot be estimated as such amounts will be likely based on future levels of work that require the specific use of those union employees covered by the plan, and the amount of that future work and the number of affected employees that may be needed is not reasonably estimable.

Cash Flows

Contributions

The Company expects to make minimum cash contributions of approximately \$5.2 million to its pension plans (approximately \$2.6 million U.S. and \$2.6 million Foreign) and approximately \$0.2 million to its other postretirement benefit plan in 2023.

Estimated Future Benefit Payments

Excluding any impact related to the PPA noted above, the following benefit payments, which reflect expected future service, as appropriate, are expected to be paid:

	Pension Benefits			Other Post-Retirement Benefits
	Foreign	U.S.	Total	
2023	\$ 6,097	\$ 6,868	\$ 12,965	\$ 222
2024	5,935	6,290	12,225	203
2025	6,423	6,271	12,694	190
2026	7,117	6,272	13,389	174
2027	6,844	6,254	13,098	151
2028 to 2032	41,304	29,868	71,172	597

The Company maintains a plan under which supplemental retirement benefits are provided to certain officers. Benefits payable under the plan are based on a combination of years of service and existing postretirement benefits. Included in total pension costs are charges of \$0.7 million, \$3.0 million and \$2.5 million for the years ended December 31, 2022, 2021 and 2020, respectively, representing the annual accrued benefits under this plan.

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Defined Contribution Plan

The Company sponsors various defined contribution plans in both its U.S. and non-U.S. subsidiaries, under which eligible participants may defer a portion of their compensation up to the allowable amount as determined by the plan. All contributions and Company matches are invested at the direction of the participant. The most significant plan is the Company's primary U.S. 401(k) plan with an employer match covering a majority of its U.S. employees. Beginning in April 2020 and continuing through March 2021, the Company matched both non-elective and elective 401(k) contributions in fully vested shares of the Company's common stock rather than cash. See Note 8 of Notes to Consolidated Financial Statements. Total Company contributions under this U.S. 401(k) plan were \$7.2 million, \$4.8 million and \$5.7 million for the years ended December 31, 2022, 2021 and 2020, respectively. Annual cash contributions to all other of the Company's defined contribution plans is approximately \$1 million.

Note 22 – Other Non-Current Liabilities

Other non-current liabilities as of December 31, 2022 and 2021 were as follows:

	2022	2021
Uncertain tax positions (includes interest and penalties - See Note 10)	\$ 20,322	\$ 28,665
Non-current income taxes payable (See Note 10)	8,883	8,500
Environmental reserves (See Note 26)	4,342	4,424
Deferred and other long-term compensation	3,132	4,820
Acquisition-related earnout liability (See Note 2)	1,024	1,568
Inactive subsidiary litigation and settlement reserve (See Note 26)	311	410
Other	650	1,228
Total other non-current liabilities	<u>\$ 38,664</u>	<u>\$ 49,615</u>

Note 23 – Equity and Accumulated Other Comprehensive Loss

The Company has 30,000,000 shares of common stock authorized with a par value of \$1, and 17,950,264 and 17,897,033 shares issued and outstanding as of December 31, 2022 and 2021, respectively. The change in shares issued and outstanding during 2022 was primarily related to 52,653 shares issued for share-based compensation plans and 578 shares issued for the exercise of stock options and other share activity.

The Company is authorized to issue 10,000,000 shares of preferred stock with \$1 par value, subject to approval by the Board. The Board may designate one or more series of preferred stock and the number of shares, rights, preferences, and limitations of each series. As of December 31, 2022, no preferred stock had been issued.

The Company has a share repurchase program that was approved by its Board in 2015 for the repurchase of up to \$100.0 million of Quaker Chemical Corporation common stock. The Company has not repurchased any shares under the program for the years ended December 31, 2022, 2021 and 2020. As of December 31, 2022, there was approximately \$86.9 million of common stock remaining to be purchased under this share repurchase program.

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The following table shows the reclassifications from and resulting balances of AOCI for the years ended December 31, 2022, 2021 and 2020:

	Currency Translation Adjustments	Defined Benefit Pension Plans	Unrealized Gain (Loss) in Available-for- Sale Securities	Derivative Instruments	Total
Balance as of December 31, 2019	\$ (44,568)	\$ (34,533)	\$ 1,251	\$ (320)	\$ (78,170)
Other comprehensive income (loss) before reclassifications	41,693	(6,617)	2,848	(4,257)	33,667
Amounts reclassified from AOCI	—	24,141	(202)	—	23,939
Related tax amounts	—	(6,458)	(555)	979	(6,034)
Balance as of December 31, 2020	(2,875)	(23,467)	3,342	(3,598)	(26,598)
Other comprehensive (loss) income before reclassifications	(46,968)	11,948	(531)	2,890	(32,661)
Amounts reclassified from AOCI	—	1,459	(3,197)	—	(1,738)
Related tax amounts	—	(3,112)	783	(664)	(2,993)
Balance as of December 31, 2021	(49,843)	(13,172)	397	(1,372)	(63,990)
Other comprehensive (loss) income before reclassifications	(82,318)	10,789	(3,276)	—	(74,805)
Amounts reclassified from AOCI	—	479	895	1,372	2,746
Related tax amounts	—	(2,691)	500	—	(2,191)
Balance as of December 31, 2022	\$ (132,161)	\$ (4,595)	\$ (1,484)	\$ —	\$ (138,240)

All reclassifications related to Unrealized gain (loss) in available-for-sale securities relate to the Company's equity interest in a captive insurance company and are recorded in Equity in net income of associated companies. The amounts reported in Other comprehensive (loss) income for non-controlling interest are related to Currency translation adjustments.

Note 24 – Fair Value Measures

The Company has valued its company-owned life insurance policies at fair value. These assets are subject to fair value measurement as follows:

Fair Value Measurements at December 31, 2022
Using Fair Value Hierarchy

Assets	Total Fair Value	Level 1	Level 2	Level 3
Company-owned life insurance	\$ 2,114	\$ —	\$ 2,114	\$ —
Total	\$ 2,114	\$ —	\$ 2,114	\$ —

Fair Value Measurements at December 31, 2021
Using Fair Value Hierarchy

Assets	Total Fair Value	Level 1	Level 2	Level 3
Company-owned life insurance	\$ 2,533	\$ —	\$ 2,533	\$ —
Total	\$ 2,533	\$ —	\$ 2,533	\$ —

The fair values of Company-owned life insurance assets are based on quotes for like instruments with similar credit ratings and terms. The Company did not hold any Level 3 investments as of December 31, 2022 or 2021, respectively.

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Items Measured at Fair Value on Nonrecurring Basis

In addition to assets and liabilities that are measured at fair value on a recurring basis, the Company is also required to measure certain items at fair value on a nonrecurring basis. The Company recorded non-cash impairment charges on goodwill and trademarks of \$93.0 million and \$38.0 million in the years ended December 31, 2022 and 2020, respectively. The determination of the estimated fair values requires Management's judgment and involves the use of significant estimates and assumptions, including assumptions with respect to future cash inflows and outflows, the WACC, royalty rates, asset lives and market multiples, among other items. For non-observable market values, the Company determines fair value using acceptable valuation principles, including the excess earnings, relief from royalty, lost profit or cost methods. Significant unobservable inputs used to estimate the fair values of the EMEA reporting unit as of December 31, 2022 included a WACC of 12.0%. See Note 16 of Notes to Consolidated Financial Statements.

Note 25 – Hedging Activities

In order to satisfy certain requirements of the Original Credit Facility as well as to manage the Company's exposure to variable interest rate risk associated with the Credit Facility, in November 2019, the Company entered into \$170.0 million notional amounts of three year interest rate swaps. See Note 20 of Notes to Consolidated Financial Statements. These interest rate swaps were designated as cash flow hedges and, as such, the contracts were marked-to-market at each reporting date and any unrealized gains or losses were included in AOCI to the extent effective and reclassified to interest expense in the period during which the transaction affects earnings or it becomes probable that the forecasted transaction will not occur.

In June 2022, the Company amended the Original Credit Facility. See Note 20 of Notes to the Consolidated Financial Statements. The Amended Credit Facility does not require the Company to fix variable interest rates on any portion of its borrowings. In October 2022, the Company's interest rate swap contracts expired. Upon expiration, the Company received a cash payment from the counterparties for approximately \$0.2 million. As of December 31, 2022, the Company has not entered into any similar interest rate swap contracts.

The balance sheet classification and fair values of the Company's derivative instruments, which are Level 2 measurements, are as follows:

Derivatives designed as Cash flow hedges:	Consolidated Balance Sheet Location	Fair Value	
		December 31,	
		2022	2021
Interest rate swaps	Prepaid expenses and other current assets	\$ —	\$ —
	Other non-current liabilities	—	1,782
		<u>\$ —</u>	<u>\$ 1,782</u>

The following table presents the net unrealized loss deferred to AOCI:

Derivatives designed as cash flow hedges:		December 31,	
		2022	2021
Interest rate swaps	AOCI	\$ —	\$ 1,372
		<u>\$ —</u>	<u>\$ 1,372</u>

The following table presents the net loss reclassified from AOCI to earnings:

Amount and location of expense reclassified from AOCI into expense (Effective Portion)		For the Years Ended December 31,		
		2022	2021	2020
Interest expense, net		\$ —	\$ (2,649)	\$ (1,754)

Prior to expiration in October 2022, interest rate swaps were entered into with a limited number of counterparties, each of which allowed for net settlement of all contracts through a single payment in a single currency in the event of a default on or termination of any one contract. As such, in accordance with the Company's accounting policy, these derivative instruments were recorded on a net basis within the Consolidated Balance Sheets.

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Note 26 – Commitments and Contingencies

In the early 1990s, the Company identified certain soil and groundwater contamination at AC Products, Inc. (“ACP”), a wholly owned subsidiary. In voluntary coordination with the Santa Ana California Regional Water Quality Board, ACP has been remediating the contamination, the principal contaminant of which is perchloroethylene (“PERC”). In 2004, the Orange County Water District (“OCWD”) filed a civil complaint against ACP and other parties seeking to recover compensatory and other damages related to the investigation and remediation of the contamination in the groundwater. Pursuant to a settlement agreement with OCWD, ACP agreed, among other things, to operate the two groundwater treatment systems to hydraulically contain groundwater contamination emanating from ACP’s site until the concentrations of PERC released by ACP fell below the current Federal maximum contaminant level for four consecutive quarterly sampling events. In 2014, ACP ceased operation at one of its two groundwater treatment systems, as it had met the above condition for closure. In 2020, the Santa Ana Regional Water Quality Control Board asked that ACP conduct some additional indoor and outdoor soil vapor testing on and near the ACP site to confirm that ACP continues to meet the applicable local standards and ACP performed such testing program work in 2022 and will continue into 2023. As of December 31, 2022, ACP believes it is close to meeting the conditions for closure of the remaining groundwater treatment system but continues to operate this system while in discussions with the relevant authorities.

As of December 31, 2022, the Company believes that the range of potential-known liabilities associated with the balance of ACP water remediation program is approximately \$0.1 million to \$1.0 million. The low and high ends of the range are based on the length of operation of the treatment system as determined by groundwater modeling. Costs of operation include the operation and maintenance of the extraction well, groundwater monitoring, program management, and soil vapor testing.

An inactive subsidiary of the Company that was acquired in the late 1970s sold certain products containing asbestos, primarily on an installed basis, and is among the defendants in numerous lawsuits alleging injury due to exposure to asbestos. The subsidiary discontinued operations in 1991 and has no remaining assets other than proceeds received from insurance settlements. To date, the overwhelming majority of these claims have been disposed of without payment and there have been no adverse judgments against the subsidiary. Based on a continued analysis of the existing and anticipated future claims against this subsidiary, it is currently projected that the subsidiary’s total liability over the next 50 years for these claims is approximately \$0.2 million (excluding costs of defense). Although the Company has also been named as a defendant in certain of these cases, no claims have been actively pursued against the Company, and the Company has not contributed to the defense or settlement of any of these cases pursued against the subsidiary.

These cases were originally handled by the subsidiary’s primary and excess insurers who had agreed in 1997 to pay all defense costs and be responsible for all damages assessed against the subsidiary arising out of existing and future asbestos claims up to the aggregate limits of their policies. A significant portion of this primary insurance coverage was provided by an insurer that is insolvent, and the other primary insurers asserted that the aggregate limits of their policies had been exhausted. The subsidiary challenged the applicability of these limits to the claims being brought against the subsidiary. In response, two of the three carriers entered into separate settlement and release agreements with the subsidiary in 2005 and 2007 for \$15.0 million and \$20.0 million, respectively.

In 2007, the subsidiary and the remaining primary insurance carrier entered into a Claim Handling and Funding Agreement, under which the carrier is paying 27% of defense and indemnity costs incurred by or on behalf of the subsidiary in connection with asbestos bodily injury claims. The agreement continues until terminated and can only be terminated by either party by providing a minimum of two years prior written notice. As of December 31, 2022, no notice of termination has been given under this agreement.

At the end of the term of the agreement, the subsidiary may choose to again pursue its claim against this insurer regarding the application of the policy limits. The Company believes that, if the coverage issues under the primary policies with the remaining carrier are resolved adversely to the subsidiary and all settlement proceeds were used, the subsidiary may have limited additional coverage from a state guarantee fund established following the insolvency of one of the subsidiary’s primary insurers. Nevertheless, liabilities in respect of claims may exceed the assets and coverage available to the subsidiary.

If the subsidiary’s assets and insurance coverage were to be exhausted, claimants of the subsidiary may actively pursue claims against the Company because of the parent-subsidiary relationship. The Company does not believe that such claims would have merit or that the Company would be held to have liability for any unsatisfied obligations of the subsidiary as a result of such claims. After evaluating the nature of the claims filed against the subsidiary and the small number of such claims that have resulted in any payment, the potential availability of additional insurance coverage at the subsidiary level, the additional availability of the Company’s own insurance and the Company’s strong defenses to claims that it should be held responsible for the subsidiary’s obligations because of the parent-subsidiary relationship, the Company believes it is not probable that the Company will incur losses. The Company has been successful to date having claims naming it dismissed during initial proceedings. Since the Company may be in this stage of litigation for some time, it is not possible to estimate additional losses or range of loss, if any.

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The Company is party to environmental matters related to certain domestic and foreign properties. These environmental matters primarily require the Company to perform long-term monitoring as well as operating and maintenance at each of the applicable sites. During the year ended December 31, 2022, there have been no significant changes to the facts or circumstances of these matters, aside from ongoing monitoring and maintenance activities and routine payments associated with each of these sites. The Company continually evaluates its obligations related to such matters, and based on historical costs incurred and projected costs to be incurred over the next 26 years, has estimated the present value range of costs for all of these environmental matters, on a discounted basis, to be between approximately \$5.0 million and \$6.0 million as of December 31, 2022, for which \$5.3 million is accrued within other accrued liabilities and other non-current liabilities on the Company's Consolidated Balance Sheet as of December 31, 2022. Comparatively, as of December 31, 2021, the Company had \$5.6 million accrued for with respect to these matters.

The Company's Sao Paulo, Brazil site was required under Brazilian environmental, health and safety regulations to perform an environmental assessment as part of a permit renewal process. Initial investigations identified soil and ground water contamination in select areas of the site. The site has conducted a multi-year soil and groundwater investigation and corresponding risk assessments based on the result of the investigations. In 2017, the site had to submit a new 5-year permit renewal request and was asked to complete additional investigations to further delineate the site based on review of the technical data by the local regulatory agency, Companhia Ambiental do Estado de São Paulo ("CETESB"). Based on review of the updated investigation data, CETESB issued a Technical Opinion regarding the investigation and remedial actions taken to date. The site developed an action plan and submitted it to CETESB in 2018 based on CETESB requirements. The site intervention plan primarily requires the site, amongst other actions, to conduct periodic monitoring for methane in soil vapors, source zone delineation, groundwater plume delineation, bedrock aquifer assessment, update the human health risk assessment, develop a current site conceptual model and conduct a remedial feasibility study and provide a revised intervention plan. In 2020, the site submitted a report on the activities completed including the revised site conceptual model and results of the remedial feasibility study and recommended remedial strategy for the site.

Other environmental matters include participation in certain payments in connection with four currently active environmental consent orders related to certain hazardous waste cleanup activities under the U.S. Federal Superfund statute. The Company has been designated a potentially responsible party ("PRP") by the Environmental Protection Agency along with other PRPs depending on the site, and has other obligations to perform cleanup activities at certain other foreign subsidiaries. These environmental matters primarily require the Company to perform long-term monitoring as well as operating and maintenance at each of the applicable sites.

The Company believes, although there can be no assurance regarding the outcome of other unrelated environmental matters, that it has made adequate accruals for costs associated with other environmental problems of which it is aware. Approximately \$0.3 million and \$0.4 million were accrued as of December 31, 2022 and 2021, respectively, to provide for such anticipated future environmental assessments and remediation costs.

During 2020, one of the Company's subsidiaries received a notice of inspection from a taxing authority in a country where certain of its subsidiaries operate which related to a non-income (indirect) tax that may be applicable to certain products the subsidiary sells. During 2021, the Company's subsidiary received notice from the taxing authority that the inspection was closed, with no tax assessment issued. Based on this development, during 2021, the Company reversed its previously recorded \$1.8 million liability related to this matter. The Company also reversed the associated \$1.1 million indemnification receivable, as the asserted tax liability in part related to a Houghton entity acquired in the Combination and for the periods prior to the Combination, for which the Company would have rights to indemnification from Houghton's former owners. Based on all available information as of the date of this report, the Company does not anticipate further tax liabilities related to this matter to be asserted by the taxing authority.

During 2021, one of the Company's Brazilian subsidiaries received a notice that it had prevailed on an existing legal claim in regard to certain non-income (indirect) taxes that had been previously charged and paid. The matter specifically relates to companies' rights to exclude the state tax on goods circulation (a valued-added-tax or VAT equivalent, known in Brazil as "ICMS") from the calculation of certain additional indirect taxes (specifically the program of social integration ("PIS") and contribution for the financing of social security ("COFINS")) levied by the Brazilian States on the sale of goods. In May 2021, the Brazilian Supreme Court concluded that ICMS should not be included in the tax base of PIS and COFINS, and confirmed the methodology for calculating the PIS and COFINS tax credit claims to which taxpayers are entitled. The Company's Brazilian entities had previously filed legal or administrative disputes on this matter and are entitled to receive tax credits and interest dating back to five years preceding the date of their legal claims. As a result of these court rulings, during 2021, the Company recognized non-income tax credits of 67.0 million BRL or approximately \$13.3 million, which included approximately \$8.4 million for the PIS and COFINS tax credits as well as interest on these tax credits of \$4.9 million, and is recorded within prepaid and other current assets on the Company's Consolidated Balance Sheet. The tax credits to which the Company's Brazilian subsidiaries are entitled are claimable once registered with the Brazilian tax authorities. The Company submitted its formal claim for tax credits in 2021. These tax credits can be used to offset future Brazilian federal taxes. As of December 31, 2022, the Company has used the full amount of credits. Also during 2021, the Brazilian Supreme Court ruled that interest income to which companies are entitled for matters such as this claim should not be taxable, which resulted in a reduction to the estimated income tax expense associated with the tax credits recorded.

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In connection with obtaining regulatory approvals for the Combination, certain steel and aluminum related product lines of Houghton were divested in August 2019. In 2021, the entity that acquired these divested product lines submitted an indemnification claim for certain alleged breaches of representation made by Houghton in the agreement pursuant to which such assets had been divested. The Company responded to the subject matters of the indemnification claim and during 2022, the matter was resolved consistent with the Company's expectations and position that there were no amounts owed by the Company.

During 2021, two of the Company's locations suffered property damages as a result of flooding and electrical fire, respectively. The Company maintains property insurance for all of its facilities globally. In Conshohocken, Pennsylvania, the Company's global headquarters as well as its laboratory experienced property damages as a result of flooding from Hurricane Ida. Also, one of the Company's North American production facilities in its Americas segment experienced a electrical fire that resulted in damage and the temporary shutdown of production, and also required remediation, cleaning and subsequent restoration. The Company, its insurance adjuster and insurance carrier are actively managing the remediation and restoration activities associated with these events and at this time the Company has concluded, based on all available information and discussions with its insurance adjuster and insurance carrier, that the losses incurred during 2021 will be covered under the Company's property insurance coverage, net of an aggregate deductible of \$2.0 million. Through December 31, 2022, the Company has received payments from its insurers of \$4.6 million associated with these events. During 2022, the Company recognized a gain on insurance recoveries of \$1.8 million. The Company has recorded an insurance receivable associated with these events of \$0.2 million as of December 31, 2022. The Company and its insurance carrier continue to review the impact of the electrical fire on the production facility's operations as it relates to a potential business interruption insurance claim; however, as of the date of this Report, the Company cannot reasonably estimate any probable amount of business interruption insurance claim recoverable. Therefore, the Company has not recorded a gain contingency for a possible business interruption insurance claim as of December 31, 2022.

The Company is party to other litigation which management currently believes will not have a material adverse effect on the Company's results of operations, cash flows or financial condition. In addition, the Company has an immaterial amount of contractual purchase obligations.