LYDALL INC /DE/
Form 10-K
February 21, 2018
UNITED STATES SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549
Form 10-K
ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the Fiscal Year Ended December 31, 2017
OR
o TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to
Commission File Number: 1-7665
Lydall, Inc.
(Exact name of registrant as specified in its charter)

Delaware	06-0865505
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
One Colonial Road, Manchester, Connecticut	06042
(Address of principal executive offices)	(Zip code)

Registrant's telephone number, including area code: (860) 646-1233
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
Common Stock, $.01 par value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes o No ý

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Exchange Act. Yes o No ý

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ý No o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ý No o

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ý

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company or an emerging growth company. See definitions of “large accelerated filer”, “accelerated filer”, “smaller reporting company” and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ý	Non-accelerated filer o (Do not check if a smaller reporting company)	Accelerated filer o	Smaller reporting company o	Emerging growth company o

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. o

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes o No ý

On June 30, 2017, the aggregate market value of the Registrant’s voting stock held by nonaffiliates was $859,559,961 based on the New York Stock Exchange closing price on that date. For purposes of this calculation, the Registrant has assumed that its directors and executive officers are affiliates.

On February 15, 2018, there were 17,354,532 shares of Common Stock outstanding, exclusive of treasury shares.

DOCUMENTS INCORPORATED BY REFERENCE

Part III incorporates information by reference to the definitive Proxy Statement to be distributed in connection with the Registrant’s
Annual Meeting of Stockholders to be held on April 27, 2018.

The exhibit index is located on pages 42 – 45.

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The information called for by Items 10, 11, 12, 13 and 14, to the extent not included in this document, is incorporated herein by reference to such information included in the Company's definitive Proxy Statement to be filed with the Securities and Exchange Commission and distributed in connection with Lydall, Inc.'s 2018 Annual Meeting of Stockholders to be held on April 27, 2018.

CAUTIONARY NOTE CONCERNING FORWARD-LOOKING STATEMENTS

Lydall, Inc. and its subsidiaries are hereafter collectively referred to as “Lydall,” the “Company” or the “Registrant.” Lydall and its subsidiaries’ names, abbreviations thereof, logos, and product and service designators are all either the registered or unregistered trademarks or trade names of Lydall and its subsidiaries.

This Annual Report on Form 10-K contains “forward-looking statements” within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). Any statements contained in this Annual Report on Form 10-K that are not statements of historical fact may be deemed to be forward-looking statements. All such forward-looking statements are intended to provide management’s current expectations for the future operating and financial performance of the Company based on current assumptions relating to the Company’s business, the economy and future conditions. Forward-looking statements generally can be identified through the use of words such as “believes,” “anticipates,” “may,” “should,” “will,” “plans,” “projects,” “expects,” “expectations,” “estimates,” “forecasts,” “pre “prospects,” “strategy,” “signs” and other words of similar meaning in connection with the discussion of future operating or financial performance. Forward-looking statements may include, among other things, statements relating to future sales, earnings, cash flow, results of operations, uses of cash and other measures of financial performance. Because forward-looking statements relate to the future, they are subject to inherent risks, uncertainties and changes in circumstances that are difficult to predict. Accordingly, the Company’s actual results may differ materially from those contemplated by the forward-looking statements. Investors, therefore, are cautioned against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Forward-looking statements in this Annual Report on Form 10-K include, among others, statements relating to:

- Overall economic, business and political conditions and the effects on the Company’s markets;
- Outlook for the fiscal year 2018;
- Expected vehicle production in the North American, European or Asian markets;
- Growth opportunities in markets served by the Company;
- Expected costs and future savings associated with restructuring programs and the combination of the Thermal/Acoustical Metals and Thermal/Acoustical Fibers segments into the Lydall Thermal Acoustical Solutions segment;
- Expected gross margin, operating margin and working capital improvements from the application of Lean Six Sigma;
- Product development and new business opportunities;
- Future strategic transactions, including but not limited to: acquisitions, joint ventures, alliances, licensing agreements and divestitures;
- Pension plan funding;
- Future cash flow and uses of cash;
- Future amounts of stock-based compensation expense;
- Future earnings and other measurements of financial performance;
- Ability to meet cash operating requirements;
- Future levels of indebtedness and capital spending;
- Ability to meet financial covenants in the Company's amended revolving credit facility;
- Future impact of the variability of interest rates and foreign currency exchange rates;
- Expected future impact of recently issued accounting pronouncements upon adoption, including the new revenue recognition standard effective January 1, 2018;
- Future effective income tax rates, including the impact of the U.S. Tax Cuts and Jobs Act, and realization of deferred tax assets;
- Estimates of fair values of reporting units and long-lived assets used in assessing goodwill and long-lived assets for possible impairment; and
- The expected outcomes of legal proceedings and other contingencies, including environmental matters

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All forward-looking statements are inherently subject to a number of risks and uncertainties that could cause the actual results of the Company to differ materially from those reflected in forward-looking statements made in this Annual Report on Form 10-K, as well as in press releases and other statements made from time to time by the Company's authorized officers. Such risks and uncertainties include, among others, worldwide economic cycles and political changes that affect the markets which the Company's businesses serve, which could have an effect on demand for the Company's products and impact the Company's profitability; challenges encountered by the Company in the integration of the Texel and Gutsche acquisitions, including execution of restructuring programs; challenges encountered in the combination of the Thermal/Acoustical Fibers and Thermal/Acoustical Metals business segments; disruptions in the global credit and financial markets, including diminished liquidity and credit availability; changes in international trade agreements including tariff regulation and trade restrictions; swings in consumer confidence and spending; unstable economic growth; volatility in foreign currency exchange rates; raw material pricing and supply issues; fluctuations in unemployment rates; retention of key employees; increases in fuel prices; changes in tax laws; and outcomes of legal proceedings, claims and investigations as well as other risks and uncertainties identified in Part I, Item 1A — Risk Factors of this Annual Report on Form 10-K. The Company does not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise.

PART I
Item 1. BUSINESS

Lydall, Inc. has been incorporated in Delaware since 1987 after originally being incorporated in Connecticut in 1969. The principal executive offices are located in Manchester, Connecticut. The Company designs and manufactures specialty engineered filtration media, industrial thermal insulating solutions, automotive thermal and acoustical barriers for filtration/separation and thermal/acoustical applications.

Lydall serves a number of markets. The Company's products are primarily sold directly to customers through an internal sales force and distributed via common carrier. The majority of products are sold to original equipment manufacturers and tier-one suppliers. The Company differentiates itself through high-quality, specialty engineered innovative products, application engineering and exceptional customer service. Lydall has a number of domestic and foreign competitors for its products, most of whom are either privately owned or divisions of larger companies.

The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and Proxy Statements are made available free of charge through the Investor Relations Section of the Company's Internet website at www.lydall.com after such material is electronically filed with, or furnished to, the Securities and Exchange Commission (the "Commission") and are also available on the Commission's website at www.sec.gov. Information found on these websites is not part of this Form 10-K. Additionally, the public may read and copy any materials the Company files with the Commission at the Commission's Public Reference room located at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the Commission at 1-800-SEC-0330.

SEGMENTS

During 2017, the Company's reportable segments were Performance Materials, Technical Nonwovens, Thermal/Acoustical Metals, and Thermal/Acoustical Fibers. The Performance Materials segment reports the results of the Filtration, Thermal Insulation and Life Sciences Filtration businesses. The Technical Nonwovens segment reports the results of Lydall's Industrial Filtration and Advanced Materials products. The Thermal/Acoustical Metals segment reports the results of Lydall's metal parts and related tooling and the Thermal/Acoustical Fibers segment reports the results of Lydall's fiber parts and related tooling, with both used primarily in automotive applications. For additional information regarding the Company's reportable segments, please refer to Note 12 in the Consolidated Financial Statements included in this Annual Report on Form 10-K.

During the third quarter of 2017, the Company announced its plan to combine the Thermal/Acoustical Metals and Thermal/Acoustical Fibers operating segments into a single operating segment named Thermal Acoustical Solutions ("TAS"). Combining these automotive segments into one segment is expected to allow for better customer alignment, leverage operating disciplines and realize efficiencies across the global automotive operations. Through December 31, 2017 these two segments continued to be managed separately as the Company defined the future global structure and strategies of the combined businesses.

Performance Materials Segment

The Performance Materials segment includes filtration media solutions primarily for air, fluid power, and industrial applications ("Filtration"), thermal insulation solutions for building products, appliances, and energy and industrial markets ("Thermal Insulation") and air and liquid life science applications ("Life Sciences Filtration"). Filtration products include LydAir® MG (Micro-Glass) Air Filtration Media, LydAir® MB (Melt Blown) Air Filtration Media, LydAir® SC (Synthetic Composite) Air Filtration Media, and Arioso™ Membrane Composite Media. These products constitute the critical media component of clean-air systems for applications in clean-space, commercial, industrial and residential HVAC, power generation, and industrial processes. Lydall has leveraged its extensive technical expertise

and applications knowledge into a suite of media products covering the vast liquid filtration landscape across the engine and industrial fields. The LyPore® Liquid Filtration Media series addresses a variety of application needs in fluid power including hydraulic filters, air-water and air-oil coalescing, industrial fluid processes and diesel fuel filtration.

Thermal Insulation products are high performance nonwoven veils, papers, mats and specialty composites for the building products, appliance, and energy and industrial markets. The Manniglas® Thermal Insulation brand is diverse in its product application ranging from high temperature seals and gaskets in ovens and ranges to specialty veils for HVAC and cavity wall insulation. The appLY® Mat Needled Glass Mats have been developed to expand Lydall's high

temperature technology portfolio for broad application into the appliance market and supplements the Lytherm® Insulation Media product brand, traditionally utilized in the industrial market for kilns and furnaces used in metal processing. Lydall's Cryotherm® Super-Insulating Media, CRS-Wrap® Super-Insulating Media and Cryo-Lite™ Cryogenic Insulation products are industry standards for state-of-the-art cryogenic insulation designs used by manufacturers of cryogenic equipment for liquid gas storage, piping, and transportation.
Life Sciences is comprised of products which have been designed to meet the stringent requirements of critical applications including biopharmaceutical pre-filtration and clarification, lateral flow diagnostic and analytical testing, respiratory protection, potable water filtration and high purity process filtration such as that found in food and beverage and medical applications. Lydall also offers ultra-high molecular weight polyethylene membranes under the Solupor® trade name. These specialty microporous membranes are utilized in various markets and applications including air and liquid filtration and transdermal drug delivery. Solupor® membranes incorporate a unique combination of high mechanical strength, chemical inertness, gamma stability and very high porosity making them ideal for many applications.

Net sales from the Performance Materials segment represented 16.7% of Lydall's net sales in 2017 compared with 19.6% in 2016 and 19.3% in 2015. Net sales generated by the foreign operations of the Performance Materials segment accounted for 34.2%, 35.3% and 33.9% of segment net sales in 2017, 2016, and 2015, respectively.

Technical Nonwovens Segment

The Technical Nonwovens segment primarily produces needle punch nonwoven solutions for myriad industries and applications. Products are manufactured and sold globally under the leading brands of Lydall Industrial Filtration, Southern Felt, Gutsche, and Texel. Industrial Filtration products include nonwoven rolled-good felt media and filter bags used primarily in industrial air and liquid filtration applications. Nonwoven filter media is an effective solution to satisfy increasing emission control regulations in a wide range of industries, including power, cement, steel, asphalt, incineration, mining, food, and pharmaceutical. Advanced Materials products include nonwoven rolled-good media used in commercial applications and predominantly serves the geosynthetics, automotive, industrial, medical, and safety apparel markets. Automotive media is provided to Tier I/II suppliers and as well as the Company's Thermal/Acoustical Fibers segment.
Technical Nonwovens segment products include air and liquid filtration media sold under the brand names Fiberlox® high performance filtration felts, Checkstatic™ conductive filtration felts, Microfelt® high efficiency filtration felts, Pleatlox® pleatable filtration felts, Ultratech™ PTFE filtration felts, Powertech® and Powerlox® power generation filtration felts, Microcap® high efficiency liquid filtration felts, Duotech membrane composite filtration felts, along with our porotex® family of high temperature filtration felts including microvel® and optivel® products. Technical Nonwovens Advanced Materials products are sold under the brand names Thermofit® thermo-formable products, Ecoduo® recycled content materials, Duotex® floor protection products, and Versaflex® composite molding materials. Technical Nonwovens also offers extensive finishing and coating capabilities which provide custom engineered properties tailored to meet the most demanding applications. The business leverages a wide range of fiber types and extensive technical capabilities to provide products that meet our customers' needs across a variety of applications providing both high performance and durability.
On July 7, 2016, the Company completed an acquisition of the nonwoven and coating materials businesses primarily operating under the Texel brand ("Texel") from ADS, Inc. ("ADS"), a Canadian based corporation. The Texel operations manufacture nonwoven needle punch materials and predominantly serve the geosynthetic, liquid filtration, and other industrial markets.

On December 31, 2016, the Company completed an acquisition of the nonwoven needle punch materials businesses, operating under the Gutsche ("Gutsche") brand, a German based corporation. The Gutsche operations manufacture nonwoven needle punch materials and predominantly serve the industrial filtration and high performance nonwoven markets.

Technical Nonwovens segment net sales represented 38.5% of the Company's net sales in 2017, 27.4% in 2016 and 26.5% in 2015. Net sales generated by foreign operations of the Technical Nonwovens segment accounted for 69.5%, 55.4% and 40.9% of segment net sales in 2017, 2016, and 2015 respectively.

Thermal/Acoustical Metals Segment

The Thermal/Acoustical Metals segment offers a full range of innovative engineered products tailored for the transportation sector to thermally shield sensitive components from high heat, improve exhaust gas treatment and lower harmful emissions as well as assist in the reduction of powertrain and road noise. The segment's products are found in the underbody (tunnel, fuel tank, rear muffler, spare tire) and underhood (outer dash, powertrain, catalytic converter, turbo charger, manifolds) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.

Thermal/Acoustical Metals segment products are formed on production lines capable of efficiently combining multiple layers of metal and thermal - acoustical insulation media to provide an engineered thermal and acoustical shielding solution for an array of application areas in the global automotive and truck markets. The flux® product family in Thermal/Acoustical Metals includes several patented or IP-rich products that address applications which include: Direct Exhaust Mount heat shields, which are assembled to high temperature components like catalytic converters, turbochargers or exhaust manifolds using aluminized and stainless steel and high performance and high temperature heat insulating materials; Powertrain heat shields that absorb noise at the source and do not contribute to the engine's noise budget; and durable, thermally robust solutions for temperature sensitive plastic components such as fuel tanks that are in proximity to high temperature heat sources.

Thermal/Acoustical Metals segment net sales represented 27.0% of the Company’s net sales in 2017, 30.9% in 2016 and 30.7% in 2015. Net sales generated by foreign operations of the Thermal/Acoustical Metals segment accounted for 50.6%, 49.8% and 54.9% of segment net sales in 2017, 2016 and 2015, respectively.

The operating results include allocations of certain costs shared between the Thermal/Acoustical Metals and Thermal/Acoustical Fibers segments.

Thermal/Acoustical Fibers Segment

The Thermal/Acoustical Fibers segment offers innovative engineered products to assist primarily in noise vibration and harshness (NVH) abatement and thermal protection within the transportation sector. The segment's products are found in the interior (dash insulators, cabin flooring), underbody (wheel well, aerodynamic belly pan, fuel tank, exhaust) and under hood (engine compartment) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.

Thermal/Acoustical Fibers segment products offer thermal and acoustical insulating solutions comprised of organic and inorganic fiber composites for the automotive and truck markets primarily in North America. Lydall’s dBCore® is a lightweight acoustical composite that emphasizes absorption principles over heavy-mass type systems. Lydall’s dBLyte® is a high-performance acoustical barrier with sound absorption and blocking properties and can be used throughout a vehicle’s interior to minimize intrusive noise from an engine compartment and road. Lydall’s ZeroClearance® is an innovative thermal solution that utilizes an adhesive backing for attachment and is used to protect vehicle components from excessive heat. Lydall’s specially engineered products provide a solution that provides weight reduction, superior noise suppression, and increased durability over conventional designs.

Thermal/Acoustical Fibers segment net sales represented 22.6% of the Company’s net sales in 2017, 26.4% in 2016 and 26.5% in 2015. There are no net sales generated by foreign operations, as the Thermal/Acoustical Fibers segment only produces domestically.

The operating results include allocations of certain costs shared between the Thermal/Acoustical Fibers and Thermal/Acoustical Metals segments.

GENERAL BUSINESS INFORMATION

Lydall holds a number of patents, trademarks and licenses. While no single patent, trademark or license is critical to the success of Lydall, together these intangible assets are of considerable value to the Company.

Typically, the Company's business can be slightly stronger in the first half of the calendar year given the timing of customer order patterns and planned customer shutdowns in North America and Europe that typically occur in the third and fourth quarters of each year. Lydall maintains levels of inventory and grants credit terms that are normal within the industries it serves. The Company uses a wide range of raw materials in the manufacturing of its products, including aluminum and other metals to manufacture most of its automotive heat shields and various glass and

petroleum derived fibers in its Performance Materials, Technical Nonwovens, and Thermal/Acoustical Fibers segments. The majority of raw materials used are generally available from a variety of suppliers.

Sales to Ford Motor Company accounted for 17.3%, 19.6% and 18.2% of Lydall's net sales in the years ended December 31, 2017, 2016 and 2015, respectively. No other customers accounted for more than 10% of Lydall's net sales in such years. Foreign and export sales were 54.2% of net sales in 2017, 46.9% in 2016, and 44.2% in 2015. Foreign sales were $322.2 million, $212.5 million and $179.6 million for the years ended December 31, 2017, 2016 and 2015, respectively. Export sales primarily to Canada, Mexico, Asia and Europe were $55.9 million, $53.2 million, and $52.5 million in 2017, 2016 and 2015, respectively. The increase in foreign sales during 2017, compared to 2016, was primarily related to the acquisitions of Texel on July 7, 2016 and Gutsche on December 31, 2017.

Foreign operations generated operating income of $15.6 million, $4.9 million, and $6.4 million for the years ended December 31, 2017, 2016 and 2015, respectively. Total foreign assets were $342.8 million, $317.8 million, and $144.2 million at December 31, 2017, 2016 and 2015, respectively. The increase in foreign operating income in 2017 compared to 2016 was primarily due to the acquisitions of Texel and Gutsche. For further detail regarding revenue and financial information about the Company's geographic areas, see Note 12 to the Consolidated Financial Statements.

The Company invested $10.8 million in 2017, $9.0 million in 2016, and $8.5 million in 2015, or approximately 2% of net sales in 2017, 2016 and 2015, in research and development to create new products and to improve existing products. All amounts were expensed as incurred. Most of the investment in research and development is application specific. There were no customer-sponsored research and development activities during the past three years.

Backlog at January 31, 2018 was $116.6 million. Lydall's backlog was $109.0 million at December 31, 2017, $94.9 million at December 31, 2016, and $72.2 million at December 31, 2015. The increase in backlog at year-end 2017 compared to year-end 2016 was primarily driven by the Technical Nonwovens segment. Thermal/Acoustical Metals and Thermal/Acoustical Fibers segment backlog, which comprises the majority of total backlog, may be impacted by various assumptions, including future automotive production volume estimates, changes in program launch timing and changes in customer development plans. The Company believes that global automotive orders are typically fulfilled within a two month period and therefore represent a reasonable timeframe to be included as Thermal/Acoustical Metals and Thermal/Acoustical Fibers segment backlog.

No material portion of Lydall's business is subject to renegotiation of profits or termination of contracts or subcontracts at the election of any governmental body.

Lydall believes that its plants and equipment are overall, in substantial compliance with applicable federal, state and local provisions that have been enacted or adopted regulating the discharge of materials into the environment, or otherwise relating to the protection of the environment (See Item 3, Legal Proceedings).

As of December 31, 2017, Lydall employed approximately 2,600 people. Three unions with contracts expiring on September 30, 2020 represent approximately 50 employees in the United States. All employees at the facilities in France and the Netherlands are covered under a National Collective Bargaining Agreement. Certain salaried and all hourly employees in Germany, the United Kingdom, China and Canada are also covered under some form of a National Collective Bargaining Agreement. Lydall considers its employee relationships to be satisfactory.

There are no significant anticipated operating risks related to foreign investment law, expropriation, or availability of material, labor or energy. The foreign and domestic operations attempt to limit foreign currency exchange transaction risk by completing transactions in functional currencies whenever practical or through the use of foreign currency forward exchange contracts when deemed appropriate.

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Item 1A. RISK FACTORS

The reader should carefully review and consider the risk factors discussed below. Any and all of these risk factors could materially affect the Company's business, financial condition, future results of operations or cash flows and possibly lead to a decline in Lydall's stock price. The risks, uncertainties and other factors described below constitute all material risk factors known to management as of the date of this report.

Global political or economic changes may negatively impact Lydall's business - Ongoing instability or changes in a country's or region's economic or political conditions could adversely affect demand for the Company's products and impact profitability. Among other factors, political conflicts or changes, disruptions in the global credit and financial markets, including diminished liquidity and credit availability, changes in international trade agreements, including tariffs regulation and trade restrictions, swings in consumer confidence and spending, unstable economic growth and fluctuations in unemployment rates causing economic instability could have a negative impact on the Company's results of operations, financial condition and liquidity. These factors also make it difficult to accurately forecast and plan future business activities.

The Company's foreign and export sales were 54.2% of net sales in 2017, 46.9% in 2016, and 44.2% in 2015. If the global economy were to take a significant downturn, depending on the length, duration and severity of such downturn, the Company's business and financial statements could be adversely affected.

The Company's Thermal/Acoustical Metals and Thermal/Acoustical Fibers segments are tied primarily to general economic and automotive industry conditions - The Company's Thermal/Acoustical Metals and Thermal/Acoustical Fibers segments are suppliers in the automotive market. Sales to the automotive market accounted for 48.3% of the Company's net sales in 2017, 56.2% in 2016, and 56.6% in 2015. The segments' net sales from products manufactured in North America were 72.3%, 73.1%, and 70.6% in 2017, 2016, and 2015, respectively, with the remainder manufactured in Europe and Asia. These segments are closely tied to general economic and automotive industry conditions as demand for vehicles depends largely on the strength of the economy, employment levels, consumer confidence levels, the availability and cost of credit, the cost of fuel, legislative and regulatory oversight and trade agreements. These factors have had, and could continue to have, a substantial impact on these segments. Adverse developments could reduce demand for new vehicles, causing Lydall's customers to reduce their vehicle production in North America, Europe and Asia and, as a result, demand for Company products would be adversely affected.

The Company's quarterly operating results may fluctuate; as a result, the Company may fail to meet or exceed the expectations of research analysts or investors, which could cause Lydall's stock price to decline - The Company's quarterly results are subject to significant fluctuations. Operating results have fluctuated as a result of many factors, including size and timing of orders and shipments, loss of significant customers, product mix, reductions in customer pricing, customer or company shut-downs, technological change, operational efficiencies and inefficiencies, competition, changes in tax laws and deferred tax asset valuation allowances, strategic initiatives, severance and recruiting charges, asset impairment, penalties or fines and general economic conditions. In addition, lower revenues may cause asset utilization to decrease, resulting in the under absorption of the Company's fixed costs, which could negatively impact gross margins. Additionally, the Company's gross margins vary among its product groups and have fluctuated from quarter to quarter as a result of shifts in product mix. Any and all of these factors could affect the Company's business, financial condition, future results of operations or cash flows and possibly lead to a decline in Lydall's stock price.

Implementation of the Company's strategic initiatives may not be successful - As part of Lydall's business strategy, the Company continues to review various strategic and business opportunities to grow the business and to assess the profitability and growth potential for each of its existing businesses. The Company may incur significant professional services expenses associated with the review and potential implementation of strategic business opportunities. The

Company cannot predict with certainty whether any recent or future strategic transactions will be beneficial to the Company. Among other things, future performance could be impacted by the Company's ability to:

- Identify and effectively complete strategic transactions;

- Obtain adequate financing to fund strategic initiatives;

- Successfully integrate and manage acquired businesses that involve numerous operational and financial risks, including difficulties in the integration of acquired operations, diversion of management's attention from other business concerns, managing assets in multiple geographic regions and potential loss of key employees and key customers of acquired operations;

- Improve operating margins through its Lean Six Sigma initiatives which are intended to improve processes and work flow, improve customer service, reduce costs and leverage synergies across the Company; and

- Successfully invest and deploy capital investments to support our business and commitments to our customers.

In order to meet its strategic objectives, the Company may also divest assets and/or businesses. Successfully executing such a strategy depends on various factors, including effectively transferring assets, liabilities, contracts, facilities and employees to any purchaser, identifying and separating the intellectual property to be divested from the intellectual property that the Company wishes to retain, reducing or eliminating fixed costs previously associated with the divested assets or business, and collecting the proceeds from any divestitures.

The Company may not have adequate cash to fund its operating requirements - The principal source of the Company’s liquidity is operating cash flows. Other significant factors that affect the overall management of liquidity include capital expenditures, investments in businesses, acquisitions, income tax payments, pension funding, share repurchases, outcomes of contingencies and availability of lines of credit and long-term financing. The Company’s liquidity can be impacted by the Company’s ability to:

- Manage working capital and the level of future profitability. The consolidated cash balance is impacted by capital equipment and inventory investments that may be made in response to changing market conditions;

- Satisfy covenants and other obligations under its existing credit facility, which could limit or prohibit Lydall’s ability to borrow funds. Additionally, these debt covenants and other obligations could limit the Company’s ability to make acquisitions, incur additional debt, make investments, or consummate asset sales and obtain additional financing from other sources.

Incurring a substantial amount of indebtedness could have an adverse effect on the Company’s financial health and make it more difficult for Lydall to obtain additional financing in the future - Incurring additional debt to fund the acquisitions' purchase price may have an adverse effect on the Company’s financial condition and may limit Lydall’s ability to obtain any necessary financing in the future for working capital, capital expenditures, future acquisitions, debt service requirements or other purposes. Additionally, the Company may not be able to generate sufficient cash flow or otherwise obtain funds necessary to meet the additional debt obligations. Any default under the Amended Credit Facility would likely result in the acceleration of the repayment obligations to our lenders.

The Company is subject to the U.S. Foreign Corrupt Practices Act and similar worldwide anti-bribery laws, which impose restrictions on the Company and violations of which may carry substantial fines and penalties and result in criminal sanctions - The U.S. Foreign Corrupt Practices Act and anti-bribery laws in other jurisdictions, including anti-bribery legislation in the United Kingdom, generally prohibit companies and their intermediaries from making improper payments for the purpose of obtaining or retaining business or other commercial advantage. The Company’s policies mandate compliance with these anti-bribery laws, violations of which often carry substantial fines and penalties and could result in criminal sanctions against the Company, Lydall’s officers or employees. The Company cannot assure that its internal control policies and procedures always will protect it from reckless or other inappropriate acts committed by the Company’s affiliates, employees or agents. Violations of these laws, or allegations of such violations, could have a material adverse effect on Lydall’s business, or financial statements and could possibly lead to a decline in Lydall's stock price.

Raw material pricing, supply issues, and disruptions in transportation networks could affect all of the Company's businesses - The Thermal/Acoustical Metals segment uses aluminum and other metals to manufacture most of its automotive heat shields. The Thermal/Acoustical Fibers and Technical Nonwovens segments use various petroleum-derivative fibers in manufacturing products, and the Performance Materials segment uses various glass-derivative fibers in manufacturing products. If the prices and duties of these raw materials, or any other raw materials used in the Company's businesses increase, the Company may not have the ability to pass incremental cost increases on to its customers. In addition, an interruption in the ability of the Company to source such materials could negatively impact operations and sales.

Impairment of the Company's goodwill or other long-lived assets has required, and may in the future require recording significant charges to earnings - The Company reviews its long-lived assets for impairment when events or changes in circumstances indicate the carrying value may not be recoverable. Goodwill is also tested by the Company for impairment during the fourth quarter of each year. Factors that may be considered a change in circumstances, indicating that the carrying value of goodwill or other long-lived assets may not be recoverable, include, but are not limited to, a decline in the Company's stock price and market capitalization, reduced future cash flow estimates, and slower growth rates.

Volatility in the securities markets, interest rates, actuarial assumptions and other factors could substantially increase the Company's costs and funding for its domestic defined benefit pension plan - The Company's domestic defined benefit pension plan is funded with trust assets invested in a diversified portfolio of securities. Changes in interest rates, mortality rates, investment returns, and the market value of plan assets may affect the funded status and cause volatility in the net periodic benefit cost and future funding requirements of such plan. A significant increase in benefit plan liabilities or future funding requirements could have a negative impact on the Company's financial statements.

The Company is involved in certain legal proceedings and may become involved in future legal proceedings all of which could give rise to liability - The Company is involved in legal proceedings that, from time to time, may be material. These proceedings may include, without limitation, commercial or contractual disputes, intellectual property matters, personal injury claims, stockholder claims, and employment matters. No assurances can be given that such proceedings and claims will not have a material adverse impact on the Company's financial statements.

The Company is subject to legal and compliance risks and oversight on a global basis and developments in these risks and related matters could have a material adverse effect on Lydall's consolidated financial position, results of operations or liquidity - The Company is subject to a variety of laws and regulations that govern our business both in the United States and internationally, including antitrust laws. Violations of these laws and regulations can result in significant fines, penalties or other damages being imposed by regulatory authorities. Expenses and fines arising out of or related to these investigations and related claims can also be significant. Despite meaningful measures that we undertake to seek to ensure lawful conduct, which include training and internal control policies, these measures may not always prevent our employees or agents from violating the laws and regulations. As a result, we could be subject to criminal and civil penalties, disgorgement, further changes or enhancements to our procedures, policies and controls, personnel changes or other remedial actions. For example, in July 2017, Lydall Gerhardi entered into a formal settlement agreement with the German Cartel Office and paid a settlement amount in August 2017 of €3.3 million (approximately $3.9 million U.S. Dollars) in connection the conclusion of an investigation relating to violations of German anti-trust laws by and among certain European automotive heat shield manufacturers, including Lydall Gerhardi. Violations of laws, or allegations of such violations, could disrupt our operations, involve significant management distraction and result in a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

Changes in Accounting Standards - The Company's accounting and financial reporting policies conform to U.S. generally accepted accounting principles ("U.S. GAAP"), which are periodically revised and/or expanded. The application of accounting principles is also subject to varying interpretations over time. Accordingly, the Company is required to adopt new or revised accounting standards or comply with revised interpretations that are issued from time to time by various parties, including accounting standard setters and those who interpret the standards, such as the FASB and the SEC. Such new financial accounting standards may change the financial accounting or reporting standards that govern the preparation of the Company's Consolidated Financial Statements. In May 2014, the FASB issued Accounting Standards Update ("ASU") 2014-09, Revenue from Contracts with Customers, which provides for comprehensive changes in revenue recognition and supersedes nearly all existing U.S. GAAP, and is applicable to the Company beginning in Q1 2018. In February 2016, the FASB issued ASU 2016-02, Leases, which is a wide-ranging change to lease accounting that is applicable to the Company beginning in 2019. Implementing changes required by

new standards, requirements or laws require interpretation of rules and development of new accounting policies and internal controls that if not appropriately applied could result in financial statement errors and deficiencies in internal control.

Changes in tax rates and exposure to additional income tax liabilities - The Company is subject to risks with respect to changes in tax law and rates, changes in rules related to accounting for income taxes, or adverse outcomes from tax audits that are in process or future tax audits in various jurisdictions in which the Company operates. On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the “Tax Reform Act”). The changes included in the Tax Reform Act are broad and complex. The final transition impacts of the Tax Reform Act may differ from the estimates provided elsewhere in this report, possibly materially, due to, among other things, changes in interpretations of the Tax Reform Act, any legislative action to address questions

that arise because of the Tax Reform Act, any changes in accounting standards for income taxes or related interpretations in response to the Tax Reform Act, or any updates or changes to estimates the company has utilized to calculate the transition impacts, including impacts from changes to current year earnings estimates and foreign exchange rates of foreign subsidiaries. In addition, certain jurisdictions in which the Company operates have statutory rates greater than or less than the United States statutory rate. Changes in the mix and source of earnings between jurisdictions could have a significant impact on the Company's overall effective tax rate.

Realization of deferred tax assets is not assured - The Company maintains valuation allowances against certain deferred tax assets where realization is not reasonably assured. The Company evaluates the likelihood of the realization of all deferred tax assets and reduces the carrying amount to the extent it believes a portion will not be realized. Changes in these assessments can result in an increase or reduction to valuation allowances on deferred tax assets and could have a significant impact on the Company's overall effective tax rate.

The Company's future success depends upon its ability to continue to innovate, improve its existing products, develop and market new products, and identify and enter new markets - Improved performance and growth are partially dependent on improvements to existing products and new product introductions planned for the future. Delays in improving or developing products and long customer qualification cycles may impact the success of new product programs. The degree of success of new product programs could impact the Company's future results. Developments by other companies of new or improved products, processes or technologies may make our products or proposed products obsolete or less competitive and may negatively impact our net sales. Accordingly, our ability to compete is in part dependent on our ability to continually offer enhanced and improved products that meet the changing requirements of our customers. If we fail to develop new products or enhance existing products, it could have a material adverse effect on our business, financial condition or results of operations.

The Company's foreign operations expose it to business, economic, political, legal, regulatory and other risks - The Company believes that in order to be competitive and grow its businesses, it needs to maintain significant foreign operations. Foreign sales were $322.2 million, $212.5 million and $179.6 million for the years ended December 31, 2017, 2016, and 2015, respectively. Foreign operations are subject to inherent risks including political and economic conditions in various countries, unexpected changes in regulatory requirements (including tariff regulations and trade restrictions), longer accounts receivable collection cycles and potentially adverse tax consequences. The Company has little control over most of these risks and may be unable to anticipate changes in international economic and political conditions and, therefore, unable to alter its business practices in time to avoid the adverse effect of any of these possible changes.

Foreign currency exchange rate fluctuations and limitations on repatriation of earnings may affect the Company's results of operations - The Company's financial results are exposed to currency exchange rate fluctuations and an increased proportion of its assets, liabilities and expenses are denominated in non-U.S. dollar currencies. During 2017 and 2016, there was significant volatility in foreign currencies that impacted the Company, primarily the British Pound Sterling, Euro, Chinese Yuan and Canadian Dollar. The Company's foreign and domestic operations seek to limit foreign currency exchange transaction risk by completing transactions in functional currencies whenever practical or through the use of foreign currency forward exchange contracts when deemed appropriate. If the Company does not successfully hedge its currency exposure, changes in the rate of exchange between these currencies and the U.S. dollar may negatively impact the Company. Translation of the results of operations and financial condition of its foreign operations into U.S. dollars may be affected by exchange rate fluctuations. Additionally, limitations on the repatriation of earnings, including imposition or increase of withholding and other taxes on remittances, may limit or negatively impact the Company's ability to redeploy or distribute cash. The Company receives a material portion of its revenue from foreign operations. Foreign operations generated approximately 46.1%, 37.5% and 34.2% of total net sales in 2017, 2016, and 2015, respectively.

The Company’s manufacturing processes are subject to inherent risk - The Company operates a number of manufacturing facilities and relies upon an effective workforce and properly performing machinery and equipment. The workforce may experience a relatively high turnover rate, causing inefficiencies associated with retraining and rehiring. The equipment and systems necessary for such operations may break down, perform poorly or fail, and possibly cause higher manufacturing costs. Manufacturing processes affect the Company’s ability to deliver quality products on a timely basis, and delays in delivering products to customers could result in the Company incurring penalties from customers.

Increases in energy pricing can affect all of the Company's businesses - Higher energy costs at the Company's manufacturing plants or higher energy costs passed on from the Company's vendors could impact the Company's profitability.

The Company's resources are limited and may impair its ability to capitalize on changes in technology, competition and pricing - The industries in which the Company sells its products are highly competitive and many of the competitors are affiliated with entities that are substantially larger and that have greater financial, technical and marketing resources. The Company's more limited resources and relatively diverse product mix may limit or impair its ability to capitalize on changes in technology, competition and pricing.

The Company's products may fail to perform as expected, subjecting it to warranty or other claims from its customers -If such failure results in, or is alleged to result in, bodily injury and/or property damage or other losses, the Company may be subject to product liability lawsuits, U.S. Food and Drug Administration product recalls and other claims, any of which could have a material adverse impact on results of operations and cash flows.

If the Company does not retain its key employees, the Company's ability to execute its business strategy could be adversely affected - The Company's success, in part, depends on key managerial, engineering, sales and marketing and technical personnel and its ability to continue to attract and retain additional personnel. The loss of certain key personnel could have a material, adverse effect upon the Company's business and results of operations. There is no assurance that the Company can retain its key employees or that it can attract competent and effective new or replacement personnel in the future.

The Company's current reserve levels may not be adequate to cover potential exposures - Estimates and assumptions may affect the reserves that the Company has established to cover uncollectible accounts receivable, excess or obsolete inventory, income tax valuation and fair market value write downs of certain assets and various liabilities. Actual results could differ from those estimates.

The Company is subject to environmental laws and regulations that could increase its expense and affect operating results - The Company is subject to federal, state, local, and foreign environmental, health and safety laws and regulations that affect operations. New and changing environmental laws and regulations may impact the products manufactured and sold to customers. In order to maintain compliance with such laws and regulations, the Company must devote significant resources and maintain and administer adequate policies, procedures and oversight. Should the Company fail to do these things, it could be negatively impacted by lower net sales, fines, legal costs, and clean-up requirements.

The Company may incur liabilities under various government statutes for the investigation and cleanup of contaminants previously released into the environment. We do not anticipate that compliance with current provisions relating to the protection of the environment or that any payments we may be required to make for cleanup liabilities will have a material adverse effect upon our cash flows, competitive position, financial condition or results of operations. Current and on-going environmental matters are further addressed in Item 3, Legal Proceedings, Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations and Note 14 to the Consolidated Financial Statements in our 2017 Annual Report on Form 10-K.

The Company may be unable to adequately protect its intellectual property, which may limit its ability to compete effectively - The Company owns intellectual property, including patents and trademarks, which play an important role in helping the Company to maintain its competitive position in a number of markets. The Company is subject to risks with respect to (i) changes in the intellectual property landscape of markets in which it competes; (ii) the potential assertion of intellectual property-related claims against the Company; (iii) the failure to maximize or successfully assert its intellectual property rights; and (iv) significant technological developments by others.

Disruptions may occur to the Company's operations relating to information technology - The capacity, reliability and security of the Company's information technology ("IT") hardware and software infrastructure and the ability to expand and update this infrastructure in response to the Company's changing needs are important to the operation of the businesses. Also, any inadequacy, interruption, loss of data, integration failure or security failure of the Company's IT technology could harm its ability to effectively operate its business, which could adversely impact the Company's results of operations and cash flows.

Increased cybersecurity requirements, vulnerabilities, threats and more sophisticated and targeted computer crime could pose a risk to the Company's systems, networks, and data - Increased global cybersecurity vulnerabilities, threats

and more sophisticated and targeted cyber-related attacks pose a risk to the security of the Company's systems and networks and the confidentiality, availability and integrity of the Company's data. While the Company attempts to mitigate these risks by employing a number of measures, including employee training, monitoring and testing, and maintenance of protective systems and contingency plans, the Company remains vulnerable to additional known or unknown threats. The Company also may have access to sensitive, confidential or personal data or information in certain of Lydall's businesses that is subject to privacy and security laws, regulations and customer-imposed controls. Despite efforts made by the Company to protect sensitive, confidential or personal data or information, the Company may be vulnerable to security breaches, ransomware, theft, misplaced or lost data, programming errors, employee errors and/or malfeasance that could potentially lead to the compromising or loss of sensitive, confidential or personal data or information and could adversely impact the Company's results of operations and cash flows. Although the Company carries cybersecurity insurance, in the event of a cyber incident, that insurance may not be extensive enough or adequate in scope of coverage or amount to cover damages the Company may incur. In addition, a cyber-related attack could result in other negative consequences, including loss of information, damage to the Company's reputation or competitiveness, remediation or increased protection costs, litigation or regulatory action.

The Company could be subject to work stoppages or other business interruptions as a result of its unionized work force - A portion of the Company's hourly employees are represented by various union locals and covered by collective bargaining agreements. These agreements contain various expiration dates and must be renegotiated upon expiration. Specifically, three union contracts expiring on September 30, 2020 represent approximately 50 employees in the United States. If the Company is unable to negotiate any of its collective bargaining agreements on satisfactory terms prior to expiration, the Company could experience disruptions in its operations which could have a material adverse effect on operations.

The Company could be negatively affected as a result of the actions of activist stockholders - Over the last few years, proxy contests and other forms of stockholder activism have been directed against numerous public companies. The Company could become engaged in a solicitation, or proxy contest, or experience other stockholder activism, in the future. Activist stockholders may advocate for certain governance and strategic changes at the Company. In the event of stockholder activism, particularly with respect to matters which our Board of Directors, in exercising their fiduciary duties, disagree with or have determined not to pursue, our business could be adversely affected because responding to actions by activist stockholders can be costly and time-consuming, disrupting our operations and diverting the attention of management, and perceived uncertainties as to our future direction may result in the loss of potential business opportunities and may make it more difficult to attract and retain qualified personnel, business partners and customers.

The Company may be unable to realize expected benefits from cost reduction, restructuring and consolidation efforts and profitability may be hurt or business otherwise might be adversely affected - In order to operate more efficiently and control costs, the Company announces from time to time restructuring or consolidation plans, which include workforce reductions as well as facility consolidations and other cost reduction initiatives. These plans are intended to generate operating expense savings through direct cost and indirect overhead expense reductions as well as other savings. The Company may undertake workforce reductions or restructuring actions in the future. These types of cost reduction and restructuring activities are complex. If the Company does not successfully manage current restructuring activities, or any other restructuring activities that it may undertake in the future, expected efficiencies and benefits might be delayed or not realized, and our operations and business could be disrupted. Risks associated with these actions and other workforce management issues include unforeseen delays in implementation of anticipated workforce reductions, additional unexpected costs, adverse effects on employee morale and the failure to meet operational targets due to the loss of employees, any of which may impair our ability to achieve anticipated cost reductions or may otherwise harm the business, which could have a material adverse effect on competitive position, results of operations, cash flows or financial condition.

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Item 1B. UNRESOLVED STAFF COMMENTS

None.

Item 2. PROPERTIES

The principal properties of the Company as of December 31, 2017 are situated at the following locations and have the following characteristics:

Location	Primary Business Segment/General Description	Type of Interest
Hamptonville, North Carolina	Thermal/Acoustical Metals and Fibers – Product Manufacturing	Owned
Yadkinville, North Carolina	Thermal/Acoustical Fibers – Product Manufacturing	Leased
Meinerzhagen, Germany	Thermal/Acoustical Metals – Product Manufacturing	Owned
Saint-Nazaire, France	Thermal/Acoustical Metals – Product Manufacturing	Owned
Taicang, China	Thermal/Acoustical Metals – Product Manufacturing	Leased
Green Island, New York	Performance Materials – Specialty Media Manufacturing	Owned
Rochester, New Hampshire	Performance Materials – Specialty Media Manufacturing	Owned
Saint-Rivalain, France	Performance Materials – Specialty Media Manufacturing	Owned
St. Elzear, Quebec, Canada	Technical Nonwovens - Filtration Media Manufacturing	Owned
St. Marie, Quebec, Canada	Technical Nonwovens - Filtration Media Manufacturing	Owned
Rossendale, United Kingdom	Technical Nonwovens - Filtration Media Manufacturing	Owned
Shanghai, China	Technical Nonwovens - Filtration Media Manufacturing	Leased
North Augusta, South Carolina	Technical Nonwovens - Filtration Media Manufacturing	Owned
Fulda, Germany	Technical Nonwovens - Filtration Media Manufacturing	Leased
Manchester, Connecticut	Corporate Office	Owned

For additional information regarding lease obligations, see Note 14 to the Consolidated Financial Statements. The Company considers its properties to be in good operating condition and suitable and adequate for its present needs. In addition to the properties listed above, the Company has several leases for sales offices and warehouses in the United States, Europe and Asia, which the Company believes are immaterial individually and in the aggregate.

Item 3. LEGAL PROCEEDINGS

The Company is subject to legal proceedings, claims, investigations and inquiries that arise in the ordinary course of business such as, but not limited to, actions with respect to commercial, intellectual property, employment, personal injury, and environmental matters. The Company believes that it has meritorious defenses against the claims currently asserted against it and intends to defend them vigorously. While the outcome of litigation is inherently uncertain and the Company cannot be sure that it will prevail in any of the cases, subject to the matter referenced below, the Company is not aware of any matters pending that are expected to have a material adverse effect on the Company's business, financial position, results of operations or cash flows.

As previously disclosed, Lydall Gerhardi GmbH Co. & KG ("Lydall Gerhardi"), an indirect wholly-owned subsidiary of Lydall, Inc. and part of Lydall's Thermal/Acoustical Metals reporting segment, cooperated with the German Federal Cartel Office, Bundeskartellamt ("German Cartel Office") in connection with an investigation relating to violations of German anti-trust laws by and among certain European automotive heat shield manufacturers, including Lydall Gerhardi.

In December 2016, Lydall Gerhardi agreed in principle with the German Cartel Office to pay a settlement amount of €3.3 million. The Company recorded the expense of €3.3 million (approximately $3.5 million U.S. Dollars) in December 2016. In July 2017, Lydall Gerhardi entered into a formal settlement agreement with the German Cartel Office, and remitted payment in full in August 2017 of €3.3 million (approximately $3.9 million U.S. Dollars), definitively concluding this matter.

In the fourth quarter of 2016, as part of a groundwater discharging permitting process, water samples collected from wells and process water basins at the Company's Rochester New Hampshire manufacturing facility, within the Performance Materials segment, showed concentrations of Perfluorinated Compounds ("PFCs") in excess of state ambient groundwater quality standards.

In January 2017, the Company received a notification from the State of New Hampshire Department of Environmental Services ("NHDES") naming Lydall Performance Materials, Inc. a responsible party with respect to the discharge of regulated contaminants and, as such, is required to take action to investigate and remediate the impacts in accordance with standards established by the NHDES. The Company conducted a site investigation, the scope of which was reviewed by the NHDES, in order to assess the extent of potential soil and groundwater contamination and develop a remedial action. Based on input received from NHDES in March 2017 with regard to the scope of the site investigation, the Company recorded $0.2 million of expense in the first quarter of 2017 associated with the expected costs of conducting this site investigation.

In the fourth quarter of 2017, the Company completed its state-approved site investigation report and submitted it to the NHDES. The Company does not know the scope or extent of its future obligations, if any, that may arise from the NHDES review of the site investigation report and therefore is unable to estimate the cost of any required future corrective actions. The Company expects a response from the NHDES to the site investigation report in the first quarter of 2018. During the year ended December 31, 2017, the environmental liability of $0.2 million recorded in the first quarter of 2017 has been reduced by $0.2 million reflecting payments made to vendors, resulting in no balance at December 31, 2017.

While the site investigation is complete, the Company cannot be sure that additional costs will not be incurred until a response is received from the NHDES nor that any future corrective action at this location would not have a material effect on the Company's financial condition, results of operations or liquidity. Provisions for such matters are charged to expense when it is probable that a liability has been incurred and reasonable estimates of the liability can be made. Estimates of environmental liabilities are based on a variety of matters, including, but not limited to, the stage of investigation, the stage of the remedial design, evaluation of existing remediation technologies, and presently enacted laws and regulations. In future periods, a number of factors could significantly impact any estimates of environmental remediation costs.

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Item 4. MINE SAFETY DISCLOSURES

Not applicable.

EXECUTIVE OFFICERS OF THE REGISTRANT

The executive officers of Lydall, Inc. or its subsidiaries, together with the offices presently held by them, their business experience since January 1, 2013, and their age as of March 2, 2018, the record date of the Company's 2018 Annual Meeting, are as follows:

Name	Age	Position and Date of Appointment	Other Business Experience Since 2013
Dale G. Barnhart	65	President, Chief Executive Officer (August 27, 2007)	Not applicable
Scott M. Deakin	51	President, Lydall Thermal / Acoustical Solutions (August 30, 2017); Executive Vice President and Chief Financial Officer (September 8, 2015)	Executive Vice President and Chief Financial Officer, Ensign-Bickford Industries, Inc. (2009 – 2015), a diversified global manufacturer with operating segments that serve the aerospace & defense, life science, specialty chemicals (divested in 2016) and food & flavoring industries.
Joseph A. Abbruzzi	59	President, Technical Nonwovens, (February 20, 2014); formerly Sr. Vice President, General Manager, Lydall Thermal/Acoustical Fibers (March 14, 2011)	Not applicable
James V. Laughlan	45	Vice President, Chief Accounting Officer and Treasurer (March 26, 2013); formerly Chief Accounting Officer, Controller and Treasurer (July 27, 2012); formerly Chief Accounting Officer and Controller (March 29, 2010)	Not applicable
Paul A. Marold	56	President, Performance Materials (February 15, 2016)	Chief Operating Officer, Sontara, a division of Jacob Holm & Sons (2014-2016), a global manufacturer of spunlace nonwoven fabrics and finished goods; Senior Vice President, Growth & Innovation, Clarcor, Inc. (2013-2014), a global manufacturer of filtration products; President, Clarcor Air Filtration Products (2011-2013), a manufacturer of air filtration products.
Chad A. McDaniel	44	Senior Vice President, Chief Administrative Officer and General Counsel (May 13, 2015); formerly Vice President, General Counsel and Secretary (May 10, 2013)	Director, Chase Corporation (2016), NYSE: CCF, a manufacturer of protective materials for high reliability applications; Associate General Counsel, United Technologies Corporation ("UTC"), Sikorsky Aircraft division (2012 – 2013),UTC is a manufacturer of high-technology products and services for the global aerospace and building systems industries.

There is no family relationship among any of the Company's directors or executive officers.

Item 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

PRICE RANGE OF COMMON STOCK AND DIVIDEND HISTORY

The Company's Common Stock is traded on the New York Stock Exchange ("NYSE") under the symbol LDL. The table below shows the range of reported sale prices on the NYSE Composite Tape for the Company's Common Stock for the periods indicated. As of December 31, 2017, 10,214 stockholders of record held 17,343,839 shares of Lydall's Common Stock, $0.01 par value.

	High	Low	Close
2017			
First Quarter	$63.80	$49.21	$53.60
Second Quarter	60.00	47.60	51.70
Third Quarter	58.65	45.45	57.30
Fourth Quarter	60.00	49.55	50.75
2016			
First Quarter	$35.10	$25.41	$32.52
Second Quarter	40.22	32.01	38.56
Third Quarter	53.30	37.96	51.13
Fourth Quarter	64.85	44.14	61.85

The Company does not pay a cash dividend on its Common Stock. The Company's Amended Credit Facility entered into on July 7, 2016, places no restrictions on cash dividend payments, so long as the payments do not place the Company in default.

ISSUER PURCHASES OF EQUITY SECURITIES

The Company acquired 48,288 shares through withholding during 2017, pursuant to provisions in agreements with recipients of restricted stock granted under the Company's equity compensation plans, which allow the Company to withhold the number of shares having fair value equal to each recipient's tax withholding due. The following table details the activity for the fourth quarter ended December 31, 2017.

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number of Shares That May Yet Be Purchased Under the Plans or Programs
Activity October 1, 2017 - October 31, 2017	—	$—	—	—
Activity November 1, 2017 - November 30, 2017	—	$—	—	—
Activity December 1, 2017 - December 31, 2017	3,936	$52.73	—	—
Total	3,936	$52.73	—	—

PERFORMANCE GRAPH

The following performance graph and related information shall not be deemed to be “soliciting material” or “filed” for purposes of Section 18 of the Exchange Act, nor shall such information be incorporated by reference into any filing of Lydall, Inc. under the Exchange Act, except to the extent that the Company specifically incorporates it by reference in such filing.

The following graph compares the cumulative total return on Lydall’s shares over the past five years with the cumulative total return on shares of companies comprising the Standard & Poor’s Smallcap 600 Index and the Russell 2000 Index. Cumulative total return is measured assuming an initial investment of $100 on December 31, 2012, including reinvestment of dividends, if any. Due to the diversity of niche businesses that the Company participates in, it is difficult to identify a reasonable peer group or one industry or line-of-business index for comparison purposes. Thus, Lydall has chosen to compare its performance to the Standard & Poor’s Smallcap 600 Index and to the Russell 2000 Index, which are comprised of issuers with generally similar market capitalizations to that of the Company.

	12/12	12/13	12/14	12/15	12/16	12/17
Lydall, Inc.	100.00	122.87	228.87	247.42	431.31	353.91
S&P Smallcap 600	100.00	141.31	149.45	146.50	185.40	209.94
Russell 2000	100.00	138.82	145.62	139.19	168.85	193.58

* $100 invested on 12/31/12 in stock or index, including reinvestment of dividends.
Fiscal year ending December 31.

Item 6. SELECTED FINANCIAL DATA

FIVE-YEAR SUMMARY

In thousands except per share amounts and ratio data	2017	2016 (1)	2015 (2)	2014 (3)	2013
Financial results for the year					
Net sales	$698,437	$566,852	$524,505	$535,829	$397,969
Gross margin	23.3 %	24.4 %	23.4 %	21.5 %	21.4 %
Operating margin	9.4 %	9.7 %	10.0 %	6.4 %	7.2 %
Net income	$49,317	$37,187	$46,259	$21,847	$19,155
Depreciation and amortization	$26,130	$19,559	$17,275	$17,646	$12,703
Capital expenditures	$24,915	$28,159	$21,555	$19,001	$13,826
Common stock per share data					
Basic net income	$2.89	$2.20	$2.76	$1.31	$1.16
Diluted net income	$2.85	$2.16	$2.71	$1.28	$1.14
Financial position					
Working capital	$171,389	$165,162	$158,303	$140,229	$123,577
Property, plant and equipment, net	$170,332	$160,795	$114,433	$115,357	$78,863
Goodwill	$68,969	$63,606	$16,841	$21,943	$18,589
Other intangible assets, net	$40,543	$41,447	$5,399	$7,841	$3,510
Total assets	$560,871	$527,029	$358,260	$361,770	$274,685
Long-term debt, net of current maturities	$76,913	$128,141	$20,156	$40,315	$1,051
Total stockholders’ equity	$353,396	$273,456	$245,225	$212,599	$200,087
Total debt to total capitalization	17.9 %	32.0 %	7.7 %	16.1 %	0.8 %

Please read Part II, Item 7 (Management’s Discussion and Analysis of Financial Condition and Results of Operations) of this Annual Report on Form 10-K and the Notes to the Consolidated Financial Statements for specific changes in the Company and its markets that provide context to the above data for the years 2015 through 2017 including, without limitation, discussions concerning (i) how global economic uncertainties have affected the Company’s results; (ii) the impact of the acquisitions and divestitures; (iii) the impact of foreign currency translation; (iv) asset impairment charges; (v) consolidation and restructuring charges (vi) the German Cartel settlement and (vii) the Company’s effective tax rate.

(1) During 2016, the Company completed the acquisitions of the Texel and Gutsche businesses. The results of Texel and Gutsche, from their respective acquisition dates on July 7, 2016 and December 31, 2016, have been included within the Company's Consolidated Financial Statements as of and for the year ended December 31, 2016 and contributed to the increase in the balance sheet line items above.

(2) On January 30, 2015, the Company sold all of the outstanding shares of common stock of its Life Sciences Vital Fluids business, reported as Other Products and Services. As a result, the Company recognized a gain on the sale of $18.6 million, reported as non-operating income, and net income of $11.8 million, or $0.69 per diluted share, for the year ended December 31, 2015.

(3) During 2014, the Company completed the acquisition of the filtration businesses of Andrews Industries, Limited on February 20, 2014. The results of these businesses were included within the Company's Consolidated Financial Statements as of and for the year ended December 31, 2014.

Item 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Overview and Outlook

Lydall, Inc. and its subsidiaries (collectively, the "Company" or "Lydall") designs and manufactures specialty engineered nonwoven filtration media, industrial thermal insulating solutions, and thermal and acoustical barriers for filtration/separation and heat abatement and sound dampening applications. Lydall principally conducts its business through four reportable segments: Performance Materials, Technical Nonwovens, Thermal/Acoustical Metals and Thermal/Acoustical Fibers, with sales globally. Effective January 1, 2018, the Thermal/Acoustical Metals and Thermal/Acoustical Fibers operating segments were combined into a single operating segment named Thermal Acoustical Solutions.

The Performance Materials segment includes filtration media solutions primarily for air, fluid power, and industrial applications ("Filtration"), thermal insulation solutions for building products, appliances, and energy and industrial markets ("Thermal Insulation") and air and liquid life science applications ("Life Sciences Filtration").

The Technical Nonwovens segment primarily produces needle punch nonwoven solutions for myriad industries and applications. Products are manufactured and sold globally under the leading brands of Lydall Industrial Filtration, Southern Felt, Gutsche, and Texel. The Industrial Filtration products include nonwoven rolled-good felt media and filter bags used primarily in industrial air and liquid filtration applications. Nonwoven filter media is an effective solution to satisfy increasing emission control regulations in a wide range of industries, including power, cement, steel, asphalt, incineration, mining, food, and pharmaceutical. The Advanced Materials products include nonwoven rolled-good media used in commercial applications and predominantly serves the geosynthetic, automotive, industrial,medical, and safety apparel markets. The automotive media is provided to Tier I/II suppliers and as well as the Company's Thermal/Acoustical Fibers segment.

The Thermal/Acoustical Metals ("T/A Metals") segment offers a full range of innovative engineered products tailored for the transportation sector to thermally shield sensitive components from high heat, improve exhaust gas treatment and lower harmful emissions as well as assist in the reduction of powertrain and road noise. Lydall products are found in the underbody (tunnel, fuel tank, rear muffler, spare tire) and underhood (outer dash, powertrain, catalytic converter, turbo charger and manifolds) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.
The Thermal/Acoustical Fibers ("T/A Fibers") segment offers innovative engineered products to assist primarily in noise vibration and harshness (NVH) abatement and thermal insulation within the transportation sector. Lydall products are found in the interior (dash insulators, cabin flooring), underbody (wheel well, aerodynamic belly pan, fuel tank, exhaust) and under hood (engine compartment) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.

During the third quarter of 2017, the Company announced its plan to combine the Thermal/Acoustical Metals and Thermal/Acoustical Fibers operating segments into a single operating segment, Thermal Acoustical Solutions. Combining these automotive segments into one segment is expected to allow the Company to better serve its customers, leverage operating disciplines and drive efficiencies across the global automotive operations. Through December 31, 2017, these two segments continued to be managed separately as the Company defined the future global structure and strategies of the combined businesses and effective January 1, 2018, the Company has commenced the reporting of the two businesses as a single consolidated operating segment.

Financial Highlights

Below are financial highlights comparing Lydall's 2017 results to its 2016 results:

Consolidated net sales were $698.4 million in 2017, compared to $566.9 million in 2016, an increase of $131.6 million, or 23.2%, with the increase primarily attributable to the acquisitions of Texel and Gutsche on July 7, 2016 and December 31, 2016, respectively, and volume increases across all segments. The change in consolidated net sales is summarized in the following table:

Components	Change in Net Sales	Percent Change
Acquisitions	$87,332	15.4 %
Parts volume and pricing change	40,984	7.2 %
Change in tooling sales	452	0.1 %
Foreign currency translation	2,818	0.5 %
Total	$131,586	23.2 %

- Gross margin decreased 110 basis points to 23.3% in 2017 compared to 24.4% in 2016, primarily driven by the T/A Metals segment, and to a lesser extent the Technical Nonwovens segment. The T/A Metals segment negatively impacted consolidated gross margin by approximately 80 basis points, primarily due to increased raw material commodity costs, reduced customer pricing, increased overhead expenses including operational inefficiencies and unfavorable mix of products. The Technical Nonwovens segment negatively impacted consolidated gross margin by approximately 20 basis points, primarily related to unfavorable mix. The T/A Fibers and Performance Materials segments had a minimal effect on consolidated gross margin in 2017 compared to 2016.

- Operating income was $65.4 million, or 9.4% of net sales in 2017, compared to $54.8 million, or 9.7% of net sales in 2016; Operating margin declined compared to 2016 due to the negative impact of lower gross margin of 110 basis points. The following components are included in operating income for 2017 and 2016 and impact the comparability of each year:

Components	2017 Operating income effect	2017 EPS impact	2016 Operating income effect	2016 EPS impact
Automotive segments consolidation expenses	1,693	$ 0.06	—	$ —
Inventory step-up purchase accounting adjustments	1,108	$ 0.04	1,954	$ 0.08
Reduction-in-force severance expenses	987	$ 0.04	—	$ —
Strategic initiatives expenses	778	$ 0.03	3,702	$ 0.17
TNW restructuring expenses	662	$ 0.03	—	$ —
German Cartel settlement	—	$ —	3,479	$ 0.20

- The Company's effective tax rate for 2017 was 19.5%, as compared to 32.4% for 2016, which included a provisional net tax benefit of $3.7 million, or $0.22 per diluted share, in the fourth quarter of 2017 to reflect the Company's estimate of the impact of the U.S. Tax Cut and Jobs Act enacted in December 2017.

- Net income was $49.3 million, or $2.85 per diluted share in 2017, compared to $37.2 million, or $2.16 per diluted share in 2016.

Acquisitions

On July 7, 2016, the Company completed an acquisition of the nonwoven and coating materials businesses primarily operating under the Texel brand (“Texel”) from ADS, Inc. (“ADS”), a Canadian based corporation. The Texel operations manufacture nonwoven needle punch materials and predominantly serve the geosynthetic, liquid filtration, and other industrial markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

On December 31, 2016, the Company completed an acquisition of the nonwoven needle punch materials businesses, operating under the Gutsche (“Gutsche”) brand, a German based corporation. The Gutsche operations manufacture nonwoven needle punch materials and predominantly serve the industrial filtration and high performance nonwoven markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

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Liquidity

Cash flows from operations was $62.9 million in 2017 compared with $69.7 million in 2016, as improved cash from net income was offset by increases in working capital, including tooling inventory of $9.2 million in advance of new platform launches in 2018. Cash was $59.9 million at December 31, 2017, net of $50.0 million paid down on the Company’s domestic credit facility during 2017, leaving availability of $94.5 million on the facility at December 31, 2017.

The Company's cash generation in 2017 allowed it to pay down a large portion of its debt, while at the same time investing in its businesses. With a strong balance sheet and a debt to EBITDA ratio of 0.9 to 1.0, the Company has ample capacity to support organic growth programs, fund capital investments and pursue attractive acquisitions that will drive profitable growth.

Outlook

Looking forward in the first quarter of 2018, backlog is solid and the Company continues to see favorable demand in its markets across all segments. While the Company does expect to face commodity cost pressures and price reductions in certain applications, the Company remains focused on realizing manufacturing productivity improvements in the TAS segment, progressing on the TNW restructuring, and driving above-market growth across all segments. Overall, the Company expects consolidated gross margin in the first quarter of 2018 to be in a range consistent with the last half of 2017 with consolidated revenues comparable to the prior year. Given Tax Reform, the Company expects its ordinary effective rate to drop to a range of 19 percent to 21 percent, allowing for both improved net income and reinvestment of a portion of the benefit to accelerate growth and achieve the Company's long-term objectives.

CONSOLIDATED RESULTS OF OPERATIONS

Net Sales

In thousands of dollars	2017	Percent Change	2016	Percent Change	2015
Net sales	$698,437	23.2 %	$566,852	8.1 %	$524,505

Net sales in 2017 increased $131.6 million, or 23.2%, compared to 2016. This increase was primarily related to greater net sales in the Technical Nonwovens segment of $113.6 million, or 20.0% of consolidated net sales, including $87.3 million of net sales from the Texel and Gutsche acquisitions, which occurred on July 7, 2016 and December 31, 2016, respectively, as well as increased net sales of $26.3 million from the other Technical Nonwovens operations. Additionally, there were volume increases in all other segments. The T/A Metals segment reported growth in net sales of $13.6 million, or 2.4% of consolidated net sales, and the T/A Fibers segment reported increased net sales of $8.3 million, or 1.5% of consolidated net sales in 2017 compared to 2016. The Performance Materials segment reported growth in net sales of $5.5 million, or 1.0% of consolidated net sales. Foreign currency translation had a favorable impact on net sales of $2.8 million, or 0.5% of consolidated net sales, in 2017 compared to 2016.

Net sales in 2016 increased $42.3 million, or 8.1%, compared to 2015. This increase was primarily related to greater net sales in the Technical Nonwovens segment of $16.4 million, or 3.1% of consolidated net sales, including $40.9 million of net sales from Texel since the acquisition date, which occurred on July 7, 2016, partially offset by lower net sales from segment legacy products of $24.5 million. The increase in net sales for the Technical Nonwovens segment included the negative impact of foreign currency translation of $4.3 million, or 3.1%, in 2016 compared to 2015. There were no Texel sales included in the Technical Nonwovens segment in 2015. The T/A Metals segment reported sales growth of $14.0 million, or 2.7% of consolidated net sales, including the negative impact of foreign currency translation of $0.6 million, or 0.4%, in 2016 compared to 2015, and the T/A Fibers segment reported net sales growth of $10.7 million, or 2.0% of consolidated net sales. The Performance Materials segment reported growth in net sales of $9.7 million, or 1.8% of consolidated net sales, in 2016 compared to 2015, with minimal impact of foreign currency translation. Net sales in the Life Sciences Vital Fluids business decreased by $1.7 million in 2016 compared to 2015 as the business was sold on January 30, 2015.

Cost of Sales

In thousands of dollars	2017	Percent Change	2016	Percent Change	2015
Cost of sales	$535,375	25.0 %	$428,310	6.5 %	$402,008

Cost of sales in 2017 increased $107.1 million, or 25.0%, compared to 2016. The increase was primarily due to increased sales in the Technical Nonwovens segment of $113.6 million, primarily related to the Texel and Gutsche acquisitions which increased cost of sales by $69.5 million, as well as increases in sales in all other segments aggregating to $27.5 million, increasing cost of sales by $27.7 million. Also contributing to the increase in cost of sales in 2017 compared to 2016 were higher raw material commodity costs in the T/A Metals and T/A Fibers segments and higher overhead costs, primarily in the T/A Metals segment, partially offset by improved mix of products in the T/A Fibers segment. Foreign currency translation increased cost of sales by $2.5 million, of 0.6%, in 2017 compared to 2016.

Cost of sales in 2016 increased $26.3 million, or 6.5%, compared to 2015. The increase was due to increased sales volumes across all of the Company's segments, which included the Texel acquisition since July 7, 2016 in the Technical Nonwovens segment, and a $2.0 million purchase accounting adjustment to cost of sales related to inventory step-up. Also contributing to the increase in cost of sales for 2016 compared to 2015 was higher labor and overhead costs in the T/A Metals segment due to operating inefficiencies. These increases to cost of sales were

partially offset by improved mix of products as well as lower raw material sourcing costs primarily in the Technical Nonwovens, T/A Fibers and Performance Materials segments and lower overhead costs in the Performance Materials segment. Foreign currency translation reduced cost of sales by $4.2 million, or 1.0%, in 2016 compared to 2015.

Gross Profit

In thousands of dollars	2017		2016		2015	
Gross profit	$163,062		$138,542		$122,497	
Gross margin	23.3	%	24.4	%	23.4	%

The decrease in gross margin by 110 basis points in 2017 compared to 2016 was primarily attributable to the T/A Metals segment which negatively impacted consolidated gross margin by approximately 80 basis points, primarily related to increased overhead expenses including operational inefficiencies, increased raw material commodity costs and reduced customer pricing in 2017 compared to 2016. The Technical Nonwovens segment negatively impacted consolidated gross margin by approximately 20 basis points, primarily related to lower customer pricing, unfavorable mix and restructuring expenses, partially offset by lower raw material commodity costs and decreased purchase accounting adjustments relating to inventory step-up in 2017 compared to 2016. Additionally, the Performance Materials segment negatively impacted consolidated gross margin by approximately 10 basis points primarily related to unfavorable mix on higher margin termination buys in 2016 and lower customer pricing in 2017. The T/A Fibers segment had a minimal effect on consolidated gross margin in 2017 compared to 2016 as improved mix of products and decreased lower margin tooling volume was offset by lower customer pricing and higher raw material commodity costs.

The increase in gross margin by 100 basis points in 2016 compared to 2015 was primarily attributable to the Performance Materials segment as a result of favorable mix of product sales and improved absorption of fixed costs on higher sales volumes, increasing consolidated gross margin by approximately 60 basis points. Additionally, the T/A Fibers segment favorably impacted consolidated gross margin by approximately 50 basis points, primarily as a result of lower raw material costs, improved material productivity and favorable product mix, partially offset by lower pricing. The Technical Nonwovens segment favorably impacted consolidated gross margin by approximately 30 basis points, which included the negative impact of a $2.0 million, or 30 basis point, purchase accounting adjustment relating to inventory step-up in 2016, offset by lower raw material costs and favorable product mix. The T/A Metals segment negatively impacted consolidated gross margin by approximately 60 basis points, primarily as a result of higher labor and overhead costs, including inefficiencies associated with new platform launches, partially offset by favorable product mix in 2016 compared to 2015.

Selling, Product Development and Administrative Expenses

In thousands of dollars	2017		2016		2015	
Selling, product development and administrative expenses	$97,635		$83,750		$70,020	
Percentage of net sales	14.0	%	14.8	%	13.3	%

Selling, product development and administrative expenses in 2017 increased by $13.9 million, or 16.6%, compared to 2016. This increase was primarily related to the Technical Nonwovens segment due to the acquisitions of Texel on July 7, 2016 and Gutsche on December 31, 2016 resulting in an additional $13.0 million of selling, product development and administrative expenses, which included $2.9 million of incremental intangible amortization expense from TNW segment acquisitions. All other selling, product development and administrative expenses increased $0.9 million, or 1.1%, in 2017 compared to 2016. This increase was primarily due to greater salaries and benefits of $2.6 million, $1.6 million of expenses associated with the planned combination of the T/A Metals and T/A Fibers segments, higher corporate consulting expenses primarily in support of organic growth initiatives of $1.6 million, greater information technology expenses of $1.2 million, and a non-cash long-lived asset impairment charge of $0.8 million in the Company's Performance Materials segment in 2017 compared to 2016. These increases were partially offset by the absence of a $3.5 million settlement charge in the fourth quarter of 2016 in connection with the German Cartel office investigation, lower strategic initiatives expenses of $2.8 million and a decrease in other selling, product development and administrative expenses of $0.6 million in 2017 compared to 2016.

Selling, product development and administrative expenses in 2016 increased by $13.7 million, or 19.6%, compared to 2015. Contributing to this increase was the acquisition of Texel in 2016 that increased expenses by $4.4 million, as there were no Texel expenses in 2015. All other selling, product development and administrative expenses increased $9.4 million, or 13.4%, in 2016 compared to 2015. This increase included $3.7 million of strategic initiatives expenses associated with the Texel and Gutsche acquisitions and a $3.5 million settlement charge in the fourth quarter of 2016 in connection with the German Cartel office investigation relating to violations of German anti-trust laws within the Company's T/A Metals segment. The remaining increase in expenses was due to higher salaries and benefits of $2.9 million, including $1.4 million of stock based compensation, primarily at the Company's corporate headquarters and

higher accrued incentive compensation expense of $1.2 million, primarily driven by improved performance in the Company's Performance Materials segment. These increases were partially offset by a $1.4 million long-lived asset impairment charge in the Performance Materials segment related to intangible assets at the Company's Solutech operation in the fourth quarter of 2015 and decreased selling, product development and administrative expenses of $0.4 million related to the Life Sciences Vital Fluids business as a result of the sale of that business on January 30, 2015.

Gain on Sale of Business

In thousands of dollars	2017	2016	2015
Gain on sale of business	$ —	$ —	$(18,647)

On January 30, 2015, the Company sold all of the outstanding shares of common stock of its Life Sciences Vital Fluids business, reported as Other Products and Services, for a cash purchase price of $30.1 million. The disposition was completed pursuant to a Stock Purchase and Sale Agreement, dated January 30, 2015, by and among the Company, and the buyer. The Company recognized a pre-tax gain on the sale of $18.6 million, reported as non-operating income for the year ended December 31, 2015. Net of income taxes, the Company reported a gain on sale of $11.8 million.

Interest Expense

In thousands of dollars	2017	2016	2015
Interest expense	$2,720	$1,068	$755
Weighted average interest rate during the year	2.2 %	1.4 %	1.3 %

The increase in interest expense in 2017 compared to 2016 was due to higher average borrowings used to finance both the Texel and Gutsche acquisitions on July 7, 2016 and December 31, 2016, respectively, and increased interest rates.

The increase in interest expense in 2016 compared to 2015 was due to higher average borrowings under the Company's Amended Credit Facility used to finance both the Texel and Gutsche acquisitions on July 7, 2016 and December 31, 2016, respectively.

Other Income and Expense

In thousands of dollars	2017	2016	2015
Other expense (income), net	$1,388	$(1,215)	$(654)

The increase in other expense, net in 2017 compared to 2016 was primarily related to net foreign currency losses recognized with the revaluation of cash, trade payables and receivables and intercompany loans denominated in currencies other than the functional currencies of the Company's subsidiaries.

The increase in other income, net in 2016 compared to 2015 was primarily related to higher foreign currency transaction gains associated with the revaluation of cash, trade payables and receivables and intercompany loans denominated in currencies other than the functional currency of the Company's subsidiaries, primarily driven by the devaluation of the British Pound Sterling.

Income Taxes

	2017	2016	2015
Effective income tax rate	19.5%	32.4%	34.9%

In 2017, the effective tax rate of 19.5% was favorably impacted by the passage and signing on December 22, 2017 of the Tax Cuts and Jobs Act (the "Tax Reform Act") that resulted in a net tax benefit of $3.7 million. The legislation significantly changes U.S. tax law by, among other things, lowering corporate income tax rates, implementing a

territorial tax system and imposing a one-time repatriation tax on undistributed foreign earnings. The Tax Reform Act permanently reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. As a result of the reduction in the U.S. corporate income tax rate from 35% to 21% under the Tax Reform Act, the Company revalued its ending net deferred tax liabilities at December 31, 2017 and recognized a provisional $4.5 million tax

benefit in the Company's consolidated statement of operations for the year ended December 31, 2017. The Tax Reform Act also provided for a one-time deemed mandatory repatriation of post-1986 undistributed foreign subsidiary earnings and profits ("E&P") through the year ended December 31, 2017. The Company had an estimated $12.0 million of undistributed foreign E&P subject to the one-time mandatory repatriation and recognized a provisional $0.5 million of income tax expense in the Company's consolidated statement of operations for the year ended December 31, 2017. The Company's undistributed earnings for which it had previously made an indefinite reinvestment assertion under ASC 740-30 are approximately $6.2 million. The Company has not yet made a determination to remain permanently reinvested outside of the United States in response to the Tax Reform Act. As a result, the Company has not included a provisional tax cost related to this balance at this time as a reasonable estimate has not been determined.

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations where a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform Act. SAB 118 provides a measurement period, not to exceed one year from the enactment of the Tax Reform Act. In accordance with SAB 118, the Company is required to reflect the income tax effects of those aspects of the Tax Reform Act for which the accounting is complete. To the extent there are areas that are incomplete, but are capable of reasonable estimates, a provisional amount is required to be recorded by the Company. If a reasonable estimate is unable to be calculated, the Company is required to disclose why. The Company has recognized provisional tax impacts related to the one-time mandatory repatriation of foreign earnings and the revaluation of deferred tax assets and liabilities and included these amounts in its consolidated financial statements for the year ended December 31, 2017. The ultimate impact may differ from these provisional amounts, possibly materially, due to, among other things, additional analysis, changes in interpretations and assumptions, additional regulatory guidance from Treasury, the Internal Revenue Service and State Governments, and actions the Company may take as a result of the Tax Reform Act.

In 2017, in addition to the Tax Reform Act, which favorably impacted the effective tax rate by a net $3.7 million, the effective tax rate of 19.5% was impacted by a favorable mix of taxable income generated from foreign operations and intercompany financing, resulting in a tax benefit of $1.7 million, net of $0.7 million of expense to correct a foreign tax error in prior years. The Company also recorded a tax benefit of $1.1 million attributable to the Domestic Production Activities Deduction, a tax benefit of $2.7 million related to stock based compensation and a tax benefit of $1.5 million attributable to the release of certain reserves for uncertain tax positions from the settlement of the IRS tax audit that closed in the third quarter of 2017. These favorable adjustments were partially offset by tax expense of $0.3 million against certain deferred tax assets in China, as future realization of the assets is not reasonably assured.

The Company’s effective tax rate for 2016 of 32.4% was positively impacted by a favorable mix of taxable income generated from countries with lower tax rates compared to that of the United States, resulting in a tax benefit of $1.3 million. The Company also recorded a tax benefit of $1.5 million attributable to the Domestic Production Activities Deduction and a tax benefit of $1.1 million related to stock based compensation. These favorable adjustments were partially offset by tax expense of $1.2 million related to a nondeductible German Cartel settlement and a net increase in valuation allowance against certain deferred tax assets of $0.7 million, primarily related to tax valuation allowances of $0.5 million recorded against certain net deferred tax assets in the Netherlands and China, as future realization of the assets is not reasonably assured.

In 2015, the effective tax rate of 34.9% was positively impacted by a favorable mix of taxable income generated from countries with lower tax rates compared to that of the United States, resulting in a tax benefit of $1.0 million. The Company also recorded a tax benefit of $1.2 million attributable to the Domestic Production Activities Deduction and a tax benefit of $1.1 million related to research and development credits. These favorable adjustments were partially offset by tax expense of $0.9 million related to a net increase in valuation allowance against certain deferred tax assets and by a $0.6 million reduction to state deferred tax assets as a result of state tax law changes that led the Company to deem the asset unrealizable in future periods. The net increase in valuation allowance against certain deferred tax

assets of $0.9 million in 2015 was primarily related to tax valuation allowances of $0.8 million recorded against certain net deferred tax assets in the Netherlands and China, as future realization of the assets is not reasonably assured.

The Company and its subsidiaries file a consolidated federal income tax return, as well as returns required by various state and foreign jurisdictions. In the normal course of business, the Company is subject to examination by taxing authorities, including such major jurisdictions as the United States, China, France, Germany, Hong Kong, the Netherlands, Canada and the United Kingdom. Within the next fiscal year, the Company expects to conclude certain income tax matters through the year ended December 31, 2014 and it is reasonably expected that net unrecognized benefits of $0.2 million may be recognized. The total amount of unrecognized tax benefits that would affect the effective tax rate if recognized is $2.5 million as of December 31, 2017. However, $1.5 million of the unrecognized tax benefits,

if recognized, would be offset in pre-tax income by the reversal of indemnification assets due to the Company. The Company is no longer subject to U.S. federal examinations for years before 2015, state and local examinations for years before 2013, and non-U.S. income tax examinations for years before 2003.

SEGMENT RESULTS

Consolidated Net Sales	For the Years Ended December 31,		
In thousands	2017	2016	2015
Performance Materials Segment:			
Filtration	$77,254	$70,430	$62,716
Thermal Insulation	29,496	27,783	28,311
Life Sciences Filtration	9,919	12,915	10,451
Performance Materials Segment net sales	116,669	111,128	101,478
Technical Nonwovens Segment (1):			
Industrial Filtration	147,087	90,415	113,044
Advanced Materials (2)	121,990	65,090	26,089
Technical Nonwovens Segment net sales	269,077	155,505	139,133
Thermal/Acoustical Metals Segment:			
Metal parts	168,995	156,187	141,117
Tooling	19,551	18,787	19,815
Thermal/Acoustical Metals Segment net sales	188,546	174,974	160,932
Thermal/Acoustical Fibers Segment:			
Fiber parts	153,424	144,345	135,595
Tooling	4,337	5,067	3,152
Thermal/Acoustical Fibers Segment net sales	157,761	149,412	138,747
Other Products and Services:			
Life Sciences Vital Fluids (3)	—	—	1,671
Other Products and Services net sales	—	—	1,671
Eliminations and Other (2)	(33,616)	(24,167)	(17,456)
Consolidated Net Sales	$698,437	$566,852	$524,505

Operating Income	For the Years Ended December 31,		
In thousands	2017	2016	2015
Performance Materials Segment	$12,043	$12,339	$6,790
Technical Nonwovens Segment (1)	26,047	15,584	13,431
Thermal/Acoustical Metals Segment	10,072	11,562	15,517
Thermal/Acoustical Fibers Segment	42,870	41,452	37,086
Other Products and Services:			
Life Sciences Vital Fluids (3)	—	—	118
Corporate Office Expenses	(25,605)	(26,145)	(20,465)
Consolidated Operating Income	$65,427	$54,792	$52,477

(1) The Technical Nonwovens segment reports results of Texel and Gutsche for the periods following the date of acquisitions of July 7, 2016 and December 31, 2016, respectively.

(2) Included in the Technical Nonwovens segment and Eliminations and Other is $26.5 million, $18.2 million and $13.8 million in intercompany sales to the T/A Fibers segment for the years ended December 31, 2017, 2016 and 2015, respectively.

(3) Other Products and Services reports results for the period preceding the date of disposition of the Life Sciences Vital Fluids business on January 30, 2015.

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Performance Materials Segment

Segment net sales increased $5.5 million, or 5.0%, in 2017 compared to 2016. Filtration product net sales and thermal insulation product net sales increased $6.8 million, or 9.7% and $1.7 million, or 6.2%, respectively, in 2017 compared to 2016. The increase in filtration product net sales was primarily due to higher overall demand and share gains for filtration products, particularly in North America and Europe. The increase in thermal insulation product net sales was primarily due to increased order activity in cryo liquid natural gas and energy related applications, and to a lesser extent, improved market demand in the insulation space in 2017 compared to 2016. These increases were partially offset by lower sales of life sciences products of $3.0 million, or 23.2%, in 2017 compared to 2016, primarily the result of lower liquid filtration product net sales of $3.5 million, as there were product termination buys of $2.4 million in 2016. Foreign currency translation had a positive impact on segment net sales of $0.7 million, or 0.6%, in 2017 compared to 2016.

The Performance Materials segment reported operating income of $12.0 million, or 10.3% of net sales in 2017, compared to operating income of $12.3 million, or 11.1% of net sales in 2016. The reduction in operating margin was primarily due to a decrease in gross margin of 60 basis points, primarily due to unfavorable mix on higher margin product termination buys in 2016, lower customer pricing and unfavorable absorption of labor and overhead costs in 2017 compared to 2016. Also contributing to the decrease in operating margin was higher selling, product development and administrative expenses of $1.1 million, or 10 basis points as a percentage of net sales, including $0.8 million from a non-cash long-lived asset impairment charge recorded in the first quarter of 2017. Other increases included higher salaries and benefits of $0.4 million, partially offset by a decrease in other selling, product development and administrative expenses of $0.1 million in 2017 compared to 2016.

Segment net sales increased $9.7 million, or 9.5%, in 2016 compared to 2015. Filtration product net sales and life sciences product net sales increased $7.7 million, or 12.3% and $2.5 million, or 23.6%, respectively, in 2016 compared to 2015. The increase in filtration product net sales was primarily due to higher overall demand and share gains for filtration products, particularly in North America and Europe, as well as net sales from new product development in Europe. The increase in life sciences product net sales was primarily due to a termination buy in advance of product discontinuance of $2.4 million. These increases were partially offset by lower net sales of thermal insulation products of $0.5 million, or 1.9%, in 2016 compared to 2015, primarily the result of continued lower demand globally for cryogenic insulation products serving the liquid natural gas market which were negatively impacted by lower oil prices. Foreign currency translation had a minimal impact on net sales for 2016 compared to 2015.

The Performance Materials segment reported operating income of $12.3 million, or 11.1% of net sales in 2016, compared to operating income of $6.8 million, or 6.7% of net sales in 2015. The increase in operating income was primarily the result of higher gross profit of $5.7 million due to gross margin improvement of 290 basis points as a result of a favorable mix of product sales, including higher margin product termination buys, and improved absorption of overhead costs due to improved demand for products. Segment selling, product development and administrative expenses increased $0.1 million in 2016 compared to 2015 as increases in 2016 of $1.5 million, primarily related to accrued incentive compensation and to a lesser extent salaries, were nearly offset by lower expense as a result of a long-lived asset impairment charge of $1.4 million, related to intangible assets at the Company's Solutech operation in 2015. Increased accrued incentive compensation was due to improved performance in the segment against annual incentive plan targets.

Technical Nonwovens Segment

Segment net sales increased by $113.6 million, or 73.0%, in 2017 compared to 2016 primarily due to net sales of $87.3 million from the acquisitions of Texel and Gutsche which occurred on July 7, 2016 and December 31, 2016, respectively. The remaining increase in segment net sales of $26.3 million, or 16.9%, was from advanced materials

products which increased $14.4 million primarily due to increased sales of automotive rolled-good material for use in the T/A Fibers segment manufacturing process, and industrial filtration products, which increased $11.9 million, primarily due to improved demand globally in power generation markets. Foreign currency translation favorably impacted segment net sales by $0.5 million, or 0.3%, in 2017 compared to 2016.

The Technical Nonwovens segment reported operating income of $26.0 million, or 9.7%, of segment net sales in 2017 compared to operating income of $15.6 million, or 10.0%, of segment net sales in 2016. The increase in segment operating income of $10.4 million was principally from the acquisitions of Texel and Gutsche, which contributed a combined increase of $7.5 million of operating income. The remaining increase in segment operating income of $2.9 million was due to increased sales from the segment's North America and China operations. The decrease in operating

margin of 30 basis points was attributable to increased selling, product development and administrative expenses of $14.1 million, or an increase of 130 basis points as a percentage of net sales, primarily due to increased Texel and Gutsche expenses of $13.7 million partially offset by improved gross margin of 90 basis points. Improved gross margin was primarily due to lower raw material costs and decreased expenses for purchase accounting adjustments to cost of sales related to inventory step-up of $0.8 million, partially offset by reduced customer pricing, unfavorable product mix and restructuring expenses of $0.4 million. Included in selling, product development and administrative expenses was incremental intangible amortization expense of $2.9 million from the acquired Texel and Gutsche businesses in 2017 compared to 2016 and 2017 restructuring expenses of $0.3 million. Foreign currency favorably impacted operating income by $0.1 million, or 0.8%, in 2017 compared to 2016.

Segment net sales increased by $16.4 million, or 11.8%, in 2016 compared to 2015. The increase in segment net sales was due to the acquisition of Texel which occurred on July 7, 2016. As a result, Texel net sales of $40.9 million since the date of the acquisition were included in 2016 net sales, including $5.9 million in industrial filtration products and $35.0 million in advanced materials products. Legacy segment net sales decreased $24.5 million, or 17.6%, in 2016 compared to 2015. Sales of legacy industrial filtration products decreased $28.5 million in 2016 compared to 2015 primarily due to lower demand in the global power generation markets, as well as general softness in China. These decreases were partially offset by higher net sales of advanced materials products of $4.0 million, primarily from automotive rolled-good material for use in the T/A Fibers segment manufacturing process in 2016 compared to 2015. Foreign currency translation had a negative impact on segment net sales of $4.3 million, or 3.1%, in 2016 compared to 2015.

The Technical Nonwovens segment reported operating income of $15.6 million, or 10.0%, of segment net sales in 2016, compared to operating income of $13.4 million, or 9.7% of segment net sales in 2015. The increase in segment operating income of $2.2 million in 2016 was from the acquisition of Texel, which included the negative impact of a $2.0 million purchase accounting adjustment to cost of sales related to inventory step-up. The increase in operating margin by 30 basis points in 2016 compared to 2015 was primarily attributable to lower raw material costs and a favorable product mix. Segment selling, product development and administrative expenses increased $3.3 million due to Texel expenses, partially offset by lower legacy business expenses related to lower professional service costs of $0.3 million, lower salaries of $0.3 million, lower other administrative costs of $0.3 million and lower accrued incentive compensation of $0.2 million. Foreign currency translation had a minimal impact on operating income in 2016 compared to 2015.

Thermal/Acoustical Metals Segment

Segment net sales increased by $13.6 million, or 7.8%, in 2017 compared to 2016. Automotive parts net sales increased by $12.8 million, or 8.2%, in 2017 compared to 2016, primarily due to increased demand from new platform launches of customers served by the Company’s global operations. Foreign currency translation had a favorable impact on parts net sales of $1.4 million, or 0.9%, in 2017 compared to 2016. Tooling net sales increased $0.8 million, or 4.1%, compared to 2016 due to the timing of new product launches. Foreign currency translation had a favorable impact on tooling sales of $0.3 million, or 1.4%, in 2017 compared to 2016.

The Thermal/Acoustical Metals segment reported 2017 operating income of $10.1 million, or 5.3%, of segment net sales, compared to $11.6 million, or 6.6% of net sales, in 2016. The decrease in operating margin of 130 basis points was due to lower gross margin of 250 basis points due to higher raw material commodity costs, reduced customer pricing and increased overhead expenses including operational inefficiencies in 2017 compared to 2016. The decrease in operating margin was partially offset by lower segment selling, product development and administrative expenses of $1.1 million, or 120 basis points as a percentage of net sales, primarily due to the absence of a $3.5 million, or 200 basis points, settlement charge in the fourth quarter of 2016 in connection with the German Cartel office investigation. This decrease to selling, product development and administrative expenses was partially offset by increased salaries of $1.2 million, or 60 basis points, consolidation expenses of $0.9 million, or 50 basis points, associated with the planned

combination of the T/A Metals and T/A Fibers segments and $0.3 million of other administrative expenses in 2017 compared to 2016. Overall, 2017 operating income and operating margin were negatively impacted by consolidation expenses of $1.0 million, or 60 basis points, and severance expenses of $0.7 million, or 40 basis points. Foreign currency translation had a minimal impact on operating income in 2017 compared to 2016.

Segment net sales increased by $14.0 million, or 8.7%, in 2016 compared to 2015. Parts net sales increased by $15.1 million, or 10.7%, in 2016 compared to 2015, due to increased demand and new platform launches from customers served by the Company's North American and Chinese automotive operations, offset to some extent by lower market share related to customers served by the Company's European automotive operations. The increase in segment net

sales was partially offset by a decrease in tooling net sales of $1.0 million, or 5.2%, in 2016 compared to 2015. Foreign currency translation negatively impacted net sales by $0.6 million, or 0.4%, in 2016 compared to 2015.

The Thermal/Acoustical Metals segment reported 2016 operating income of $11.6 million, or 6.6% of net sales, compared to $15.5 million, or 9.6% of net sales, in 2015. The decrease of $3.9 million was principally due to an increase in selling, product development and administrative costs of $4.0 million in 2016 compared to 2015, primarily related to a $3.5 million settlement agreed to in the fourth quarter of 2016 with the German Cartel Office. In addition, salaries and benefits increased $0.6 million in 2016 compared to 2015. The decrease in operating income as a percentage of net sales of 300 basis points was primarily due to lower gross margins of approximately 140 basis points due to operating inefficiencies causing higher labor and overhead costs to meet increased demand in North America and changing product mix in Europe. Foreign currency translation had a minimal impact on operating income in 2016 compared to 2015.

Thermal/Acoustical Fibers Segment

Segment net sales increased by $8.3 million, or 5.6%, in 2017 compared to 2016. Parts net sales increased by $9.1 million, or 6.3%, in 2017 compared to 2016. The increase in parts net sales was driven by higher consumer demand for vehicles in North America on Lydall's existing and new platforms. This increase was partially offset by a decrease in tooling net sales of $0.7 million, or 14.4%, in 2017 compared to 2016 due to the timing of new product launches.

The Thermal/Acoustical Fibers segment reported 2017 operating income of $42.9 million, or 27.2% of net sales, compared to operating income of $41.5 million, or 27.7%, in 2016. The increase in operating income was primarily attributable to increased parts net sales, partially offset by decreased gross margin of 80 basis points as a result of lower customer pricing and increased raw material commodity costs partially offset by favorable mix of product sales, including decreased lower margin tooling volume. Segment selling, product development and administrative expenses increased $0.1 million, or 20 basis points as a percentage of net sales, primarily due to expenses associated with the combination of the T/A Metals and T/A Fibers segments.

Segment net sales increased by $10.7 million, or 7.7%, in 2016 compared to 2015. Parts net sales increased by $8.8 million, or 6.5%, in 2016 compared to 2015. The increase in parts net sales was driven by higher consumer demand for vehicles in North America on Lydall's existing platforms and new platform awards and to a lesser extent, the impact of a key customer planned shut-down in the beginning of 2015. Tooling net sales increased $1.9 million, or 60.8%, in 2016 compared to 2015 due to timing of new product launches. Domestic automobile production increased 2.0% in 2016 compared to 2015.

The Thermal/Acoustical Fibers segment reported 2016 operating income of $41.5 million, or 27.7% of net sales, compared to operating income of $37.1 million, or 26.7%, in 2015. The increase in operating income was primarily attributable to increased parts net sales and gross margin improvement of approximately 150 basis points as a result of lower raw material sourcing costs, improved material productivity and favorable mix of product sales, partially offset by lower pricing with customers. Segment selling, product development and administrative expenses increased by $1.2 million in 2016 compared to 2015 primarily due to higher salaries and benefits of $0.8 million and increased product development expenses of $0.3 million.

Other Products and Services

On January 30, 2015, the Company sold all of the outstanding shares of common stock of its Life Sciences Vital Fluids business for a cash purchase price of $30.1 million. The disposition was completed pursuant to a Stock Purchase and Sale Agreement, dated January 30, 2015, by and among the Company, and the buyer. The Company recognized a pre-tax gain on the sale of $18.6 million, reported as non-operating income in the first quarter of 2015. Net of income taxes, the Company reported a gain on sale of $11.8 million.

Life Sciences Vital Fluids net sales and operating income decreased by $1.7 million and $0.1 million, respectively, in 2016 compared to 2015 due to the sale of this business in the first quarter of 2015.

Corporate Office Expenses

The decrease in corporate office expenses of $0.4 million in 2017 compared to 2016 was primarily due to decreased strategic initiatives expenses of $2.8 million, partially offset by increased consulting expenses of $1.3 million, primarily

related to organic growth initiatives, higher salaries of $0.5 million, increased recruiting expenses of $0.3 million and increases in other administrative expenses of $0.3 million in 2017 compared to 2016.

The increase in corporate office expenses of $5.7 million in 2016 compared to 2015 was primarily due to $3.7 million of acquisition related expenses, which included costs associated with the Texel and Gutsche acquisitions. Other items contributing to the increase in corporate office expenses were higher salaries and benefits of $1.6 million, including stock based compensation of $1.0 million, higher accrued incentive compensation of $0.3 million and increases in other administrative expenses of $0.1 million in 2016 compared to 2015.

LIQUIDITY AND CAPITAL RESOURCES

	For the Year Ended December 31,		
In thousands except ratio data	2017	2016	2015
Cash and cash equivalents	$59,875	$71,934	$75,909
Cash provided by operating activities	$62,936	$69,727	$36,110
Cash (used for) provided by investing activities	$(27,329)	$(177,708)	$7,905
Cash (used for) provided by financing activities	$(53,209)	$106,375	$(26,707)
Depreciation and amortization	$26,130	$19,559	$17,275
Capital expenditures	$(27,006)	$(25,466)	$(20,645)
Total debt	$77,190	$128,775	$20,479
Total capitalization (debt plus equity)	$430,586	$402,231	$265,704
Total debt to total capitalization	17.9%	32.0%	7.7%

The Company assesses its liquidity in terms of its ability to generate cash to fund operating, investing and financing activities. The principal source of liquidity is operating cash flows. In addition to operating cash flows, other significant factors that affect the overall management of liquidity include capital expenditures, investments in businesses, strategic transactions, income tax payments, debt service payments, outcomes of contingencies, foreign currency exchange rates, foreign cash repatriation and pension funding. The Company manages worldwide cash requirements by considering available funds among domestic and foreign subsidiaries. The Company expects to finance its 2018 operating cash and capital spending requirements from existing cash balances, cash provided by operating activities and through borrowings under the Amended Credit Facility, as needed.

At December 31, 2017, the Company held $59.9 million in cash and cash equivalents, including $8.5 million in the U.S. with the remaining held by foreign subsidiaries.

Operating Cash Flows

Net cash provided by operating activities in 2017 was $62.9 million compared with $69.7 million in 2016. In 2017, net income and non-cash adjustments were $78.7 million compared to $61.8 million in 2016. Net operating assets and liabilities in 2017 increased $15.8 million since December 31, 2016, compared to a decrease in net operating assets and liabilities in 2016 of $7.9 million since December 31, 2015. The increase in net operating assets and liabilities in 2017 was primarily due to increases of $11.1 million in inventories, $8.0 million in accounts receivable, $5.2 million in benefit plan liabilities and $4.7 million in accrued taxes, partially offset by an increase of $14.3 million in accounts payable. Increased tooling inventory of $9.2 million, in preparation of new automotive platform launches in 2018, primarily drove the increase in inventories. The increase in accounts receivable was primarily due to higher net sales in the fourth quarter of 2017 compared to the fourth quarter of 2016 across all segments. The decrease in benefit plan liabilities was mainly due to cash contributions to the Company's domestic pension plan of $3.6 million in 2017. The decrease in accrued taxes was primarily due to the timing of income tax payments within our foreign operations. The increase in accounts payable was primarily driven by the timing of tooling inventory purchases within

Thermal/Acoustical Fibers and Metals segments during fourth quarter of 2017.

Net cash provided by operating activities in 2016 was $69.7 million compared with $36.1 million in 2015, an increase of $33.6 million driven by improved operating performance, working capital management and cash flows from the Texel acquisition. In 2016, net income and non-cash adjustments were $61.8 million compared to $52.7 million in 2015. Net

operating assets and liabilities in 2016 decreased $7.9 million since December 31, 2015, compared to an increase in net operating assets and liabilities in 2015 of $16.5 million since December 31, 2014. The decrease in net operating assets and liabilities in 2016 was primarily due to a $3.4 million increase in other, net, an increase of $3.5 million in accounts payable and an increase in accrued payroll and other compensation of $1.8 million, partially offset by increased prepaid expenses and other current assets of $3.4 million. The increase in other, net, was primarily the result of an accrual of $3.5 million recorded in the fourth quarter of 2016 for the settlement of the German Cartel Office investigation which was paid in the third quarter of 2017. The increase in accounts payable was primarily driven by the timing of inventory purchases and payments for capital expenditures within the fourth quarter of 2016.

Investing Cash Flows

Net cash used for investing activities was $27.3 million in 2017 compared to $177.7 million in 2016. Investing activities in 2017 included a final purchase price adjustment of $0.3 million related to the Gutsche acquisition. In 2016, investing activities included cash outflows of $101.1 million to fund the Texel acquisition, net of cash acquired of $1.6 million, and cash outflows of $51.1 million to fund the Gutsche acquisition, net of cash acquired of $9.4 million. Cash outflows for capital expenditures in 2017 were $27.0 million compared to $25.5 million in 2016.

Net cash used for investing activities was $177.7 million in 2016 compared to net cash provided by investing activities of $7.9 million in 2015. Investing activities in 2016 consisted of cash outflows of $101.1 million to fund the Texel acquisition, net of cash acquired of $1.6 million, and cash outflows of $51.1 million to fund the Gutsche acquisition, net of cash acquired of $9.4 million. Cash outflows for capital expenditures in 2016 were $25.5 million compared to $20.6 million in 2015, with the increase coming primarily within the Company's T/A Fibers and T/A Metals segments to support facility and new product platform expansion projects. In 2015, the Company received $28.6 million in proceeds from the sale of the Life Sciences Vital Fluids business, net of transaction expenses.

Financing Cash Flows

In 2017, net cash used for financing activities was $53.2 million compared with net cash provided by financing activities of $106.4 million in 2016. In 2016, the Company borrowed $116.6 million against its Amended Credit Facility to fund the purchases of the Texel and Gutsche businesses. Debt repayments were $51.8 million and $10.3 million in 2017 and 2016, respectively. The Company acquired $2.8 million in company stock through its equity compensation plans in 2017 compared to $1.1 million in 2016. The Company also received $1.3 million from the exercise of stock options during 2017, compared to $1.2 million during 2016.

In 2016, net cash provided by financing activities was $106.4 million compared with net cash used for financing activities of $26.7 million in 2015. In 2016, the Company borrowed $116.6 million against its Amended Credit Facility to fund the purchase of the Texel and Gutsche businesses. Debt repayments were $10.3 million and $20.6 million in 2016 and 2015, respectively. The Company acquired $1.1 million in company stock through its equity compensation plans in 2016 compared to $8.7 million in company stock through its stock repurchase and equity compensation plans in 2015. The Company also received $1.2 million from the exercise of stock options during 2016, compared to $1.5 million during 2015.

Financing Arrangements

On July 7, 2016, the Company amended its $100.0 million senior secured revolving credit facility which increased the available borrowing from $100 million to $175 million, added a fourth lender and extended the maturity date to July 7, 2021. The Amended Credit Facility is secured by substantially all of the assets of the Company. Under the terms of the Amended Credit Facility, the lenders are providing a $175 million revolving credit facility to the Company, under which the lenders may make revolving loans and issue letters of credit to or for the benefit of the Company and its subsidiaries. The Company may request the Amended Credit Facility be increased by an aggregate amount not to

exceed $50 million through an accordion feature, subject to specified conditions set forth in the Amended Credit Facility.

The Amended Credit Facility contains a number of affirmative and negative covenants, including financial and operational covenants. The Company is required to meet a minimum interest coverage ratio. The interest coverage ratio requires that, at the end of each fiscal quarter, the ratio of consolidated EBIT to Consolidated Interest Charges, both as defined in the Amended Credit Facility, may not be less than 2.0 to 1.0 for the immediately preceding 12 month period. In addition, the Company must maintain a Consolidated Leverage Ratio, as defined in the Amended Credit Facility, as of the end of each fiscal quarter of no greater than 3.0 to 1.0. The Company must also meet minimum

consolidated EBITDA as of the end of each fiscal quarter for the preceding 12 month period of $30.0 million. The Company was in compliance with all covenants during 2017 and at December 31, 2017.

Interest is charged on borrowings at the Company's option of either: (i) Base Rate plus the Applicable Rate, or (ii) the Eurodollar Rate plus the Applicable Rate. The Base Rate is a fluctuating rate equal to the highest of (a) the federal funds rate plus 0.50%, (b) the prime rate as set by Bank of America, and (c) the Eurocurrency Rate plus 1.00%. The Eurocurrency Rate means (i) if denominated in LIBOR quoted currency, a fluctuating LIBOR per annum rate equal to the London Interbank Offered Rate; (ii) if denominated in Canadian Dollars, the rate per annum equal to the Canadian Dealer Offered Rate; or (iii) the rate per annum as designated with respect to such alternative currency at the time such alternative currency is approved by the Lenders. The Applicable Rate is determined based on the Company's Consolidated Leverage Ratio (as defined in the Amended Credit Agreement). The Applicable Rate added to the Base Rate Committed Loans ranges from 15 basis points to 100 basis points, and the Applicable Rate added to Eurocurrency Rate Committed Loans and Letters of Credit ranges from 75 basis points to 175 basis points. The Company pays a quarterly fee ranging from 17.5 basis points to 30 basis points on the unused portion of the $175 million available under the Amended Credit Facility. At December 31, 2017, the Company had borrowing availability of $94.5 million under the Amended Credit Facility, net of $76.6 million of borrowings outstanding and standby letters of credit outstanding of $3.9 million.

In April 2017, the Company entered into a three-year interest rate swap agreement with a bank which converts the interest on the first notional $60.0 million of the Company's one-month LIBOR-based borrowings under its Amended Credit Facility from a variable rate, plus the borrowing spread, to a fixed rate of 1.58% plus the borrowing spread. The notional amount reduces quarterly by $5.0 million through March 31, 2020. The Company is accounting for the interest rate swap agreement as a cash flow hedge. Effectiveness of this derivative agreement is assessed quarterly by ensuring that the critical terms of the swap continue to match the critical terms of the hedged debt.

In addition to the amounts outstanding under the Amended Credit Facility, the Company has various acquired foreign credit facilities totaling approximately $9.8 million. At December 31, 2017, the Company's foreign subsidiaries had $0.1 million in borrowings outstanding as well as $2.8 million in standby letters of credit outstanding.

Future Cash Requirements

The Company manages worldwide cash requirements considering available funds among domestic and foreign subsidiaries. The Company expects to fund its operating cash requirements from existing cash balances, cash generated by operations, and through borrowings, as needed, under its existing domestic and foreign credit facilities. The Company continually explores its core markets for suitable acquisitions, joint ventures, alliances and licensing agreements. If completed, such activities would be financed with existing cash balances, cash generated from operations, borrowings under the credit facilities described under "Financing Arrangements" above or other forms of financing, as required.

At December 31, 2017, total indebtedness was $77.2 million, of which $76.6 million was a domestic revolver loan governed by the Amended Credit Facility, $0.1 million was borrowings under foreign credit facilities and $0.5 million was capital leases, totaling 17.9% of the Company's total capital structure. Cash requirements for 2018 are expected to include the funding of ongoing operations, capital expenditures, restructuring programs, payments due on capital and operating leases, pension plan contributions, income tax payments and optional prepayments on the revolver loan. Capital spending for 2018 is expected to be approximately $30 million to $35 million.

The funded status of the Company's domestic defined benefit pension plan is dependent upon many factors, including returns on invested assets, levels of market interest rates, mortality rates and levels of contributions to the plan. The Company is not obligated to make any minimum contributions during the 2018 plan year but expects to contribute approximately $3.0 million to $4.0 million to its defined benefit pension plan in 2018. See Note 9 to the Consolidated

Financial Statements for additional information regarding the Company's pension plans.

Contractual Obligations

The following table summarizes the Company's significant contractual obligations as of December 31, 2017 and the effect of such contractual obligations are expected to have on the Company's liquidity and cash flows in future periods. For recent financing activity please refer to "Financing Arrangements" above.

	Payments Due by Period						
In thousands	2018	2019	2020	2021	2022	After 5 years	Total
Contractual Obligations:							
Operating leases	$4,829	$3,842	$2,934	$1,981	$1,877	$10,341	$25,804
Capital leases*	283	292	36	—	—	—	611
Long-term debt*	1,995	1,995	1,995	76,769			82,754
Tax relating to mandatory repatriation of foreign undistributed earnings	244	—	—	—	—	—	244
Total Contractual Obligations	$7,351	$6,129	$4,965	$78,750	$1,877	$10,341	$109,413

*Includes estimated interest payments

The Company has capital lease agreements for machinery and equipment at multiple operations requiring monthly principal and interest payments through 2020. Operating leases are primarily related to buildings, office equipment, vehicles and machinery.

With the exception of the revolver loan and interest rate swap agreement, the Company's long-term debt payments and interest rates relating to its foreign debt and capital lease obligations debt were fixed as of December 31, 2017. Refer to Note 6 to the Consolidated Financial Statements for additional discussion on long-term debt. Actual payments may vary significantly from those included in the table above depending on future debt levels, timing of debt repayments and sources of funding utilized.

In addition to the above contractual obligations, the Company utilizes letters of credit in the ordinary course of business for security deposit requirements. Outstanding letters of credit were $6.7 million and $6.1 million at December 31, 2017 and 2016, respectively.

The above table does not reflect net tax contingencies of $2.5 million, the timing of which is uncertain. Refer to Note 13 to the Consolidated Financial Statements for additional discussion on unrecognized tax benefits.

Purchase orders or contracts for normal purchases of raw materials and other goods and services are not included in the table above. The Company is not able to determine the aggregate amount of such purchase orders that represent contractual obligations, as purchase orders may represent authorizations to purchase rather than binding agreements. For purposes of this table, contractual obligations for purchase of goods or services are defined as agreements that are enforceable and legally binding on the Company and that specify all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable price provisions; and the approximate timing of the transactions. The Company does not have significant agreements for the purchase of raw materials or other goods specifying minimum quantities or set prices that exceed expected requirements.

CRITICAL ACCOUNTING ESTIMATES

The preparation of the Company's Consolidated Financial Statements in accordance with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Note 1 in Notes to Consolidated Financial Statements describes the significant accounting policies used in the preparation of the Consolidated Financial Statements. The Company's management is required to make judgments about and estimates of the effect of matters that are inherently uncertain. Actual results could differ from management's estimates. The most significant areas involving management judgments and estimates are described below.

Goodwill

The Company had goodwill of $69.0 million at December 31, 2017 and $63.6 million at December 31, 2016. Goodwill is not amortized, but rather is subject to impairment tests annually or more frequently when an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying value. The identification and measurement of goodwill impairment involves the estimation of the fair value of reporting units,

including related goodwill. The Company’s reporting units are operating segments or components of operating segments for which discrete financial information is available and segment management regularly reviews the operating results of that reporting unit.

During the fourth quarter of 2017, the Company performed its annual impairment analysis of the $55.7 million of goodwill in the Technical Nonwovens reporting unit and $13.3 million of goodwill in the Performance Materials reporting unit. The Company used the qualitative method to analyze the goodwill for the Performance Materials and Technical Nonwovens reporting units. When considering capital markets environment, economic conditions, industry trends, results of operations, and other factors, the Company concluded that it is not more likely than not that the fair value of each reporting unit is less than its carrying amount. For the Performance Materials reporting unit, the Company also considered changes in assumptions used in the Company's most recent quantitative annual testing, including results of operations, the magnitude of excess of fair value over carrying value and other factors. As a result, the Company concluded that the Performance Materials and Technical Nonwovens reporting units' goodwill was not impaired.

In the event that the Company’s operating results in the future do not meet current expectations, management, based upon conditions at the time, would consider taking restructuring or other actions as necessary to maximize profitability. Future cash flows can be affected by numerous factors including changes in economic, industry or market conditions, changes in the underlying business or products of the reporting unit, changes in competition and changes in technology. Any changes in key assumptions about the business and its prospects, changes in any of the factors discussed above or other factors could affect the fair value of one or more of the reporting units resulting in an impairment charge.

Impairment of Long-Lived Assets

Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets may not be recoverable. Determination of recoverability is based on the Company’s judgment and estimates of undiscounted future cash flows resulting from the use of the assets and their eventual disposition. Measurement of an impairment loss for long-lived assets that management expects to hold and use is based on the fair value of the assets and measurement of an impairment loss for long-lived assets that are held for sale is based on the fair value of the assets less costs to sell. If the carrying values of the assets are determined to be impaired, then the carrying values are reduced to their estimated fair values, or fair value less costs to sell. The fair values of the impaired assets are determined based on applying a combination of market approaches, including independent appraisals when appropriate, the income approach, which utilizes cash flow projections, and the cost approach.

During the fourth quarter of 2017, the Company performed an impairment analysis for the long-lived asset group at the Company’s St. Nazaire, France operation, included in the Thermal/Acoustical Metals segment. In connection with the Company’s on-going efforts to improve performance in its Thermal/Acoustical Metals segment, the Company regularly evaluates both tactical and strategic options. The process of exploring strategic options for the facility during the fourth quarter of 2017 resulted in an indicator of possible impairment. The Company concluded that the St. Nazaire asset group had undiscounted cash flow that was in excess of its carrying value of $11.6 million and, as a result, the asset group was not impaired at December 31, 2017.

The estimate of undiscounted cash flows of the St. Nazaire long-lived asset group was based on the best information available as of the date of the assessment, which incorporated management's assumptions around cash flows generated from future operations, the estimated economic useful life of the primary asset within the St. Nazaire long-lived asset group, as well as other market information. If St. Nazaire’s cash flows in the future do not meet current expectations, or an alternative strategy for the facility is implemented, a thorough analysis of all the facts and circumstances existing at that time would need to be performed to determine if recording an impairment loss is necessary.

During the first quarter of 2017, the Company tested for impairment a discrete long-lived asset group in the Performance Materials segment with a carrying value of $1.3 million, as a result of indicators of possible impairment.

To determine the recoverability of this asset group, the Company completed an undiscounted cash flow analysis and compared it to the asset group carrying value. This analysis was primarily dependent on the expectations for net sales over the estimated remaining useful life of the underlying asset group. The impairment test concluded that the asset group was not recoverable as the resulting undiscounted cash flows were less than their carrying amount. Accordingly, the Company determined the fair value of the asset group to assess if there was an impairment. Determining fair value is judgmental in nature and requires the use of significant estimates and assumptions considered to be Level 3 inputs. To determine the estimated fair value of the asset group the Company used the market approach. Under the market approach, the determination of fair value considered market conditions including an independent appraisal of the

components of the asset group. The estimated fair value of the asset group was $0.5 million, below its carrying value of $1.3 million, which resulted in a long-lived asset impairment charge of $0.8 million included in selling, product development and administrative expenses during the quarter ended March 31, 2017. This long-lived asset group, with a net book value of $0.5 million, is classified as held for sale as of December 31, 2017.

Pensions

Pension cost and the related obligations recognized in the Consolidated Financial Statements are determined on an actuarial basis. The determination of such amounts is made in consultation with the Company's outside actuaries based on information and assumptions provided by the Company. A substantial portion of the Company's pension amounts relate to its domestic defined benefit pension plan. Pension plans outside the United States were not significant at December 31, 2017. The domestic defined benefit pension plan, which covers certain domestic Lydall employees, is noncontributory and benefits are based on either years of service or eligible compensation paid while a participant is in a plan. The plan has been closed to new employees for several years and benefits under the pension plan are no longer accruing.

A significant element in determining the Company's pension cost is the expected return on plan assets. Based on a review of market trends, actual returns on plan assets and other factors, including the allocation of the Company's investments between equity and fixed income funds, the Company's expected long-term rate of return on plan assets was 5.80% at December 31, 2017, which will be utilized for determining 2018 pension cost. An expected long-term rate of return of 6.30% was used for determining 2017 pension expense and 7.00% in determining 2016 pension expense. In determining the expected return on plan assets, the Company considers the relative weighting of plan assets, the historical performance of marketable debt and equity securities and economic and other indicators of future performance. Investment management objectives include maintaining an adequate level of diversification to balance market risk and to provide sufficient liquidity for near-term payments of benefits accrued under the plan and to pay the expenses of administration. The investment plan assets are stated at fair value, which is based on quoted market prices in an active market. The expected long-term rate of return on assets is applied to the value of plan assets at the beginning of the year and this produces the expected return on plan assets that is included in the determination of pension cost for that year. The difference between this expected return and the actual return on plan assets is deferred, within certain parameters, as discussed below. The Company continually evaluates its expected long-term rate of return and will adjust such rate as deemed appropriate.

At the end of each year, the Company determines the discount rate to be used to calculate the present value of plan liabilities, as well as the following year's pension cost. The discount rate is an estimate of the current interest rate at which the pension liabilities could be effectively settled at the end of the year. The Company based its discount rate assumption on an analysis which included the selection of a bond portfolio comprised of high quality fixed income investments whose cash flows would provide for the projected benefit payments of the plan. The discount rate is then developed as the single rate that equates the market value of the bond portfolio to the discounted value of the plan's benefit payments. At December 31, 2017 and 2016, the Company determined this rate to be 3.71% and 4.21%, respectively. Increases or decreases in the discount rate result in decreases and increases, respectively, in the projected benefit obligation. Actuarial losses, related to the decrease in discount rate at December 31, 2017, increased the pension plan liability $2.1 million and decreased other comprehensive income net-of-tax by $1.6 million. The net effect on pension liabilities from changes in the discount rate is deferred within certain parameters, as discussed below.

Pension accounting guidance requires that gains or losses be deferred unless the unrecognized net gain or loss at the end of a year exceeds a "corridor" (as defined in the pension accounting guidance). If the deferred gain or loss exceeds the corridor at the end of the year, then the amount in excess of the corridor is amortized over a period equal to the average remaining service period of active employees expected to receive benefits. Since benefit accruals were frozen on certain domestic defined benefit pension plans on June 30, 2006, these plan participants are considered inactive

participants. Therefore, the gain/loss amortization for these plans is amortized over the average remaining life expectancy of all plan participants. As of December 31, 2017 and 2016, the net deferred loss exceeded the corridor. Consequently, pension cost for 2018 will include amortization of a portion of the deferred loss in excess of the corridor. The amount of amortization in future years will be dependent on changes in the components of the deferred loss amount, particularly actual return on plan assets in relation to the estimated return on plan assets, as well as future increases or decreases in the discount rate.

In 2014, the Society of Actuaries issued an updated set of mortality tables and improvement scale collectively known as RP-2014 and MP-2014, respectively. The Company reviewed the findings and recommendations of these reports with their actuary. Based on that review, the Company elected to utilize the Society of Actuaries' base mortality scale

RP-2014 with the BB-2D mortality improvement scale, as the Company believed at the time that the BB-2D mortality improvement table more accurately reflected recent rates of mortality improvement since 2006 for the general population compared to the MP-2014 table. In 2017, the Society of Actuaries issued MP-2017, an updated mortality improvement table. The Company evaluated the MP-2017 table and decided to adopt the most recently issued tables using the RP-2014 mortality scale with the MP-2017 mortality improvement scale. The Company believes the recently issued MP-2017 table more accurately reflects mortality improvement assumptions for the domestic pension plan.

A one-quarter percentage point change in the assumed long-term rate of return on the Company's domestic pension plan as of December 31, 2017 would impact the Company's 2018 pre-tax income by approximately $0.1 million. A one-quarter percentage point decrease in the discount rate on the Company's domestic pension plan as of December 31, 2017 would have a minimal impact on the Company's 2018 pre-tax income. The Company reviews these and other assumptions at least annually.

For the year ended December 31, 2017, the Company recognized pension expense related to its domestic defined benefit pension plan of $0.8 million as a result of the expected return on assets being lower than the aggregate of interest cost and the amortization of actuarial loss.

As discussed above, the Company's discount rate was 3.71% at December 31, 2017 and will be used for purposes of determining 2018 pension cost. Pension expense for 2018 is expected to be in the range of $0.3 million to $0.4 million. The Company contributed $3.6 million to its domestic defined benefit pension plan during 2017 and expects to contribute approximately $3.0 million to $4.0 million in 2018, but is evaluating this strategy as a result of the recent changes to U.S. tax law enacted on December 22, 2017.

Income Taxes

The Company accounts for income taxes following ASC 740 (Accounting for Income Taxes) recognizing deferred tax assets and liabilities using enacted tax rates for the effect of temporary differences between book and tax basis of recorded assets and liabilities. Deferred tax assets are reduced by a valuation allowance if it is more likely than not that some or all of a deferred tax asset will not be realized.

In assessing the need for a valuation allowance, the Company analyzes historical financial results by jurisdiction and estimates future taxable income, considering the feasibility of ongoing tax planning strategies and the realizable benefit of tax loss carryforwards. Valuation allowances related to deferred tax assets can be impacted by changes in tax law, changes in statutory tax rates and future levels of taxable income. In the event the Company was to determine that it would not be able to realize all or a portion of its deferred tax assets in the future, the Company would reduce such amounts through a charge to income in the period that such determination was made. Conversely, if the Company was to determine that it would be able to realize its deferred tax assets in the future in excess of the net carrying amounts, the Company would decrease the recorded valuation allowance and record an increase to income in the period that such determination was made.

On December 22, 2017, the United States enacted significant changes to U.S. tax law following the passage and signing of the Tax Cuts and Jobs Act (the "Tax Reform Act"). The legislation significantly changes U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a one-time repatriation tax on undistributed foreign earnings. The Tax Reform Act permanently reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. Income tax effects resulting from changes in tax laws are accounted for by the Company in accordance with authoritative guidance, which requires that these tax effects be recognized in the period in which the law is enacted.

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations where a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform Act. SAB 118 provides a measurement period, not to exceed one year from the enactment of the Tax Reform Act. In accordance with SAB 118, the Company is required to reflect the income tax effects of those aspects of the Tax Reform Act for which the accounting is complete. To the extent there are areas that are incomplete, but are capable of reasonable estimates, a provisional amount is required to be recorded by the Company. If a reasonable estimate is unable to be calculated, the Company is required to disclose why. The Company has recognized provisional tax impacts related to the one-time mandatory repatriation of foreign earnings and the revaluation of deferred tax assets and liabilities and included these amounts in its consolidated financial statements for the year ended December 31, 2017. The ultimate impact may differ from these provisional amounts, possibly materially, due to, among other things, additional analysis, changes

in interpretations and assumptions, additional regulatory guidance from Treasury, the Internal Revenue Service and State Governments, and actions the Company may take as a result of the Tax Reform Act.

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recognized for future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to reverse. As a result of the reduction in the U.S. corporate income tax rate from 35% to 21% under the Tax Reform Act, the Company revalued its ending net deferred tax liabilities at December 31, 2017 and recognized a provisional $4.5 million tax benefit in the Company's consolidated statement of operations for the year ended December 31, 2017.

The Tax Reform Act also provided for a one-time deemed mandatory repatriation of post-1986 undistributed foreign subsidiary earnings and profits ("E&P") through the year ended December 31, 2017. The Company had an estimated $12.0 million of undistributed foreign E&P subject to the deemed mandatory repatriation and recognized a provisional $0.5 million of income tax expense in the Company's consolidated statement of operations for the year ended December 31, 2017. The Company's undistributed earnings for which it had previously made an indefinite reinvestment assertion under ASC 740-30 are approximately $6.2 million. The Company has not yet made a determination to remain permanently reinvested outside of the United States in response to the Tax Reform Act. As a result, the Company has not included a provisional tax cost related to this balance at this time as a reasonable estimate has not been determined.

While the Tax Reform Act provides for a territorial tax system, beginning in 2018, it includes two new U.S. tax base erosion provisions, the global intangible low-taxed income ("GILTI") provisions and the base-erosion and anti-abuse tax ("BEAT") provisions. The GILTI provisions require the Company to include in its U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets. The Company has elected to account for GILTI tax in the period in which it is incurred, and therefore has not provided any deferred tax impacts of GILTI in its consolidated financial statements for the year ended December 31, 2017. The BEAT provisions in the Tax Reform Act eliminate the deduction of certain base-erosion payments made to related foreign corporations, and impose a minimum tax if greater than regular tax. The Company does not expect it will be subject to this tax and therefore has not included any tax impacts of BEAT in its consolidated financial statements for the year ended December 31, 2017. Starting January 1, 2018, the Company will account for BEAT in the period in which it is incurred to the extent this expectation changes.

The Company and its subsidiaries file a consolidated federal income tax return, as well as returns required by various state and foreign jurisdictions. In the normal course of business, the Company is subject to examination by taxing authorities, including such major jurisdictions as the United States, China, France, Germany, Hong Kong, the Netherlands, Canada and the United Kingdom. Within the next fiscal year, the Company expects to conclude certain income tax matters through the year ended December 31, 2014 and it is reasonably expected that net unrecognized benefits of $0.2 million may be recognized. The total amount of unrecognized tax benefits that would affect the effective tax rate if recognized is $2.5 million as of December 31, 2017. However, $1.5 million of the unrecognized tax benefits, if recognized, would be offset in pre-tax income by the reversal of indemnification assets due to the Company. The Company is no longer subject to U.S. federal examinations for years before 2015, state and local examinations for years before 2013, and non-U.S. income tax examinations for years before 2003.

Equity Compensation Plans

The Company accounts for awards of equity instruments under the fair value method of accounting and recognizes such amounts in the Consolidated Statements of Operations. The Company recognizes expense on a straight-line basis over the vesting period of the entire award. Prior to January 1, 2016, stock compensation expense included estimated

effects of forfeitures. Upon adoption of ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, in the first quarter of 2016, an accounting policy election was made to account for forfeitures as they occur. Compensation expense for performance based awards is based upon the service period and management's assessment of the probability of achieving the performance goals and adjusted based upon actual achievement. The Company estimates the fair value of option grants based on the Black Scholes option-pricing model. Expected volatility and expected term are based on historical information. The calculation assumes that future volatility and expected term are not likely to materially differ from the Company's historical stock price volatility and historical exercise data, respectively.

The fair value of each option granted is estimated on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions for the years ended December 31:

	2017		2016		2015	
Risk-free interest rate	2.2	%	1.8	%	1.8	%
Expected life	5.5 years		5.5 years		5.5 years	
Expected volatility	33	%	42	%	43	%
Expected dividend yield	—	%	—	%	—	%

Contingencies and Environmental Obligations

The Company makes judgments and estimates in accordance with applicable accounting rules when it establishes reserves for legal proceedings, claims, investigations, environmental obligations and other contingent matters. Provisions for such matters are charged to expense when it is probable that a liability has been incurred and reasonable estimates of the liability can be made. Estimates of environmental liabilities are based on a variety of matters, including, but not limited to, the stage of investigation, the stage of the remedial design, evaluation of existing remediation technologies, and presently enacted laws and regulations. The amount and timing of all future expenses related to legal proceedings, claims, investigations, environmental obligations and other contingent matters may vary significantly from the Company's estimates.

RECENTLY ISSUED ACCOUNTING STANDARDS

See Note 17 to the Consolidated Financial Statements for information regarding accounting standards issued by the FASB but not effective until after December 31, 2017.

OTHER KEY FINANCIAL ITEMS

Off Balance Sheet Arrangements — Other than operating leases, the Company does not have any other material off-balance sheet financing arrangements.

Inflation — Inflation generally affects the Company through its costs of labor, equipment, energy and raw materials. The increased costs of these items have generally been offset by price increases, operating improvements and other cost-saving initiatives. The Company also has certain arrangements in which it can pass through inflation on raw material costs to its customers.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Lydall's limited market risk exposures relate to changes in foreign currency exchange rates and interest rates.

FOREIGN CURRENCY RISK

The Company has operations in Germany, France, the United Kingdom, the Netherlands, China and Canada, in addition to the United States. As a result of this, the Company's financial results are affected by factors such as changes in foreign currency exchange rates or economic conditions in the foreign markets where the Company manufactures and distributes its products. The Company's currency exposure is to the US Dollar, the Euro, the British Pound Sterling, the Japanese Yen, the Chinese Yuan, the Hong Kong Dollar and the Canadian Dollar. The Company's foreign and domestic operations attempt to limit foreign currency exchange transaction risk by completing transactions in local functional currencies, whenever practicable. The Company may periodically enter into foreign currency forward exchange contracts to mitigate exposure to foreign currency volatility. In addition, the Company utilizes bank loans and other debt instruments throughout its operations. To mitigate foreign currency risk, such debt is denominated primarily in the functional currency of the operation maintaining the debt.

The Company also has exposure to fluctuations in currency risk on intercompany loans that the Company makes to certain of its subsidiaries. The Company may periodically enter into foreign currency forward contracts which are intended to offset the impact of foreign currency movements on the underlying intercompany loan obligations.

INTEREST RATE RISK

The Company's interest rate exposure is most sensitive to fluctuations in interest rates in the United States and Europe, which impact interest paid on its debt. In July 2016 and December 2016, the Company borrowed $85.0 million and $31.6 million, respectively, to fund the Texel and Gutsche acquisitions, from its Amended Credit Facility, with a variable interest rate, of which $76.6 million remains outstanding at December 31, 2017. The Company has debt with variable rates of interest based generally on LIBOR. Increases in interest rates could therefore significantly increase the associated interest payments that the Company is required to make on this debt. From time to time, the Company may enter into interest rate swap agreements to manage interest rate risk.

In April 2017, the Company entered into a three year interest rate swap agreement with a bank which converts the interest on the first notional $60.0 million of the Company's one-month LIBOR-based borrowings under its revolver loan from a variable rate, plus the borrowing spread, to a fixed rate of 1.58% plus the borrowing spread. The notional amount reduces quarterly by $5.0 million through March 31, 2020.

The Company has assessed its exposure to changes in interest rates by analyzing the sensitivity to Lydall's earnings assuming various changes in market interest rates. Assuming a hypothetical increase of one percentage point in interest rates on the variable portion of the $76.6 million outstanding borrowings as of December 31, 2017, the Company's net income would decrease by an estimated $0.3 million over a twelve month period.

The weighted average interest rate on long-term debt was 2.2% for the year ended December 31, 2017, compared with 1.4% and 1.3% for the years ended December 31, 2016 and 2015, respectively.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The response to this Item is contained under Item 15. "Exhibits, Financial Statement Schedules."

Item 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

Item 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures
Under the supervision and with the participation of management, including the Company's President and Chief Executive Officer and its Executive Vice President and Chief Financial Officer, the Company has, pursuant to Rule 13a-15(b) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), evaluated the effectiveness of the design and operation of its disclosure controls and procedures (as defined under Rule 13a-15(e) of the Exchange Act). Based upon that evaluation, the Company's President and Chief Executive Officer and its Executive Vice President and Chief Financial Officer have concluded that, as of December 31, 2017, the Company's disclosure controls and procedures are effective.

Changes in Internal Control Over Financial Reporting
There has been no change in the Company's internal control over financial reporting (as defined in Rule 13a-15(f) of the Exchange Act) that occurred during the fiscal quarter ended December 31, 2017 that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

Management's Report on Internal Control Over Financial Reporting
The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting. 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 reporting purposes in accordance with accounting principles generally accepted in the United States of America. Due to its inherent limitations, internal control over financial reporting may not prevent or detect misstatements.

Management has assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2017. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control - Integrated Framework (2013 Framework). Management concluded that based on its assessment, the Company's internal control over financial reporting was effective as of December 31, 2017. The effectiveness of the Company's internal control over financial reporting as of December 31, 2017 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

Item 9B. OTHER INFORMATION

None.

PART III

Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Information required by this Item is incorporated by reference from the sections entitled “Proposal 1 — Election of Directors,” “Corporate Governance” and “Section 16(a) Beneficial Ownership Reporting Compliance” of the definitive Proxy Statement of Lydall to be filed with the Commission within 120 days of the fiscal year ended December 31, 2017 in connection with the Annual Meeting of Stockholders to be held on April 27, 2018 (the “2018 Proxy Statement”). Information regarding the Executive Officers of the Company is contained in this Annual Report on Form 10-K.

The Company’s Code of Ethics and Business Conduct for all employees and its Code of Ethics for the Chief Executive Officer, Senior Financial Officers and all Accounting and Financial Personnel can be obtained free of charge on the Company’s website under the Corporate Governance section or by contacting the Office of the General Counsel, P.O. Box 151, One Colonial Road, Manchester, CT 06045-0151.

The Company intends to post on its website all disclosures that are required by law or New York Stock Exchange listing standards concerning any amendments to, or waivers from, the provisions of these documents.

Item 11. EXECUTIVE COMPENSATION

Information required by this Item is incorporated by reference from the sections entitled “2017 Director Compensation,” “Compensation Discussion and Analysis,” “Executive Compensation Tables,” “Corporate Governance — Compensation Committee Interlocks and Insider Participation” and “Compensation Discussion and Analysis — Compensation Committee Report on Executive Compensation” of the 2018 Proxy Statement.

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

Certain information required by this Item is incorporated by reference from the section entitled “Securities Ownership of Directors, Certain Officers and 5% Beneficial Owners” of the 2018 Proxy Statement.

The following table provides information about the Company’s Common Stock that may be issued upon exercise of options and rights under all of the Company’s existing equity compensation plans at December 31, 2017. The number of securities remaining available for issuance at December 31, 2017 was 643,855 and includes shares that may be issued as restricted stock, performance shares and other stock awards.

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in

			column (a)) (c)
Equity compensation plans approved by security holders	652,298	$ 22.16	643,855
Equity compensation plans not approved by security holders	—	—	—
Total	652,298	$ 22.16	643,855

Item 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Information required by this Item is incorporated by reference from the sections entitled “Corporate Governance — Independence Determination,” “Related Party Transactions,” and “Compensation Committee Interlocks and Insider Participation” of the 2018 Proxy Statement.

Item 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information required by this Item is incorporated by reference from the sections entitled “Proposal 4 — Ratification of Appointment of Independent Auditors,” and “Principal Fees and Services” of the 2018 Proxy Statement.

PART IV

Item 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

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Consolidated Balance Sheets at December 31, 2017 and 2016	F-5
Consolidated Statements of Cash Flows for the years ended December 31, 2017, 2016, and 2015	F-6
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Notes to Consolidated Financial Statements	F-8
(a) 2. Financial Statement Schedule:	
Schedule II — Valuation and Qualifying Accounts for the years ended December 31, 2017, 2016, and 2015	S-1

Other schedules for which provision is made in the applicable accounting regulations of the Securities and Exchange Commission are not required under the related instructions, are inapplicable or are presented in "Notes to Consolidated Financial Statements" and therefore have been omitted.

a) 3. Exhibits Included Herein or Incorporated by Reference:

2.1	Share Purchase Agreement, dated July 7, 2016, by and among ADS, Inc. and Lydall Canada Acquisition Corp., filed as Exhibit 2.1 to the Registrant's Form 8-K dated July 12, 2016 and incorporated herein by reference. The Registrant will supplementally furnish any omitted schedules to the Commission upon request.
2.2	Sale and Purchase Agreement dated February 20, 2014, by and among the Andrew Industries Limited, Lydall Inc. and Lydall UK Ltd., filed as Exhibit 10.1 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference. The Registrant will supplementally furnish any omitted schedules to the Commission upon request.
3.1	Restated Certificate of Incorporation of the Registrant, as amended through the date of filing of this Annual Report on Form 10-K, filed as Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q dated April 30, 2015 and incorporated herein by this reference.
3.2	Bylaws of the Registrant, as amended and restated as of August 1,2015, filed as Exhibit 3.1 to the Registrant's Form 8-K dated August 5, 2015 and incorporated herein by this reference.
4.1	Certain long-term debt instruments, each representing indebtedness in an amount equal to or less than 10 percent of the Registrant's total consolidated assets, have not been filed as exhibits to this Annual Report on Form 10-K. The Registrant will file these instruments with the Commission upon request.
10.1*	Employment Agreement with Dale G. Barnhart dated July 31, 2007, filed as Exhibit 10.1 to the Registrant's Form 8-K dated August 3, 2007 and incorporated herein by this reference.
10.2*	Employment Agreement with Chad A. McDaniel dated May 8, 2013, filed as Exhibit 10.5 to the Registrant's Annual Report on Form 10-K dated March 5, 2014 and incorporated herein by reference.
10.3*	Employment Agreement with Joseph A. Abbruzzi dated March 31, 2014, filed as Exhibit 10.6 to the Registrant's Annual Report on Form 10-K dated March 3, 2015 and incorporated herein by reference.
10.4*	Employment Agreement with James V. Laughlan dated August 3, 2015, filed as Exhibit 10.1 to the Registrant's Form 8-K dated August 5, 2015 and incorporated herein by reference.
10.5*	Employment Agreement with Scott M. Deakin dated August 21, 2015, filed as Exhibit 10.1 to the Registrant's Form 8-K dated August 21, 2015 and incorporated herein by reference.
10.6*	Employment Agreement with Paul A. Marold dated February 18, 2016, filed as Exhibit 10.6 to the Registrant's Annual Report on Form 10-K dated February 22, 2017 and incorporated herein by reference.
10.7*	Indemnification Agreement with Dale G. Barnhart dated July 31, 2007, filed as Exhibit 10.2 to the Registrant's Form 8-K dated August 3, 2007 and incorporated herein by this reference.
10.8*	Lydall, Inc. Annual Incentive Performance Program adopted March 30, 2016 and effective January 1, 2016, filed as Exhibit 99.1 to the Registrant's Form 8-K dated April 1, 2016 and incorporated herein by reference.
10.9	Form of Indemnification Agreement between Lydall, Inc. and non-employee directors, filed as Exhibit 10.1 to the Registrant's Form 8-K dated June 19, 2009 and incorporated herein by this reference.
10.10*	Amended and Restated Lydall 2003 Stock Incentive Compensation Plan, filed as Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q dated May 2, 2011 and incorporated herein by this reference.
10.11*	Lydall 2012 Stock Incentive Plan, filed as Exhibit A to the Registrant's Definitive Proxy Statement dated March 16, 2012 and incorporated herein by this reference.
10.12*	Form of Restricted Share Award Agreement to Non-Employee Directors (Under the Lydall 2012 Stock Incentive Plan), filed as Exhibit 10.9 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.13*	Form of Non-Qualified/Incentive Stock Option Agreement (Under the Lydall 2012 Stock Incentive Plan) for U.S. employees, filed as Exhibit 10.4 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.14*	Form of Restricted Stock Award Agreement (Under the Lydall 2012 Stock Incentive Plan) for U.S. Employees, filed as Exhibit 10.8 to the Registrant's to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.15*	Form of Non-Qualified Stock Option Agreement (Under the Lydall 2012 Stock Incentive Plan) for Netherland employees, filed as Exhibit 10.10 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein

by this reference.

10.16*	Form of Non-Qualified Stock Option Agreement (Under the Lydall 2012 Stock Incentive Plan) for French employees, filed as Exhibit 10.11 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.17*	Form of Non-Qualified Stock Option Agreement (Under the Lydall 2012 Stock Incentive Plan) for German employees, filed as Exhibit 10.12 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.18*	Form of Lydall, Inc. Performance Share Award Agreement (Three-Year Period) for U.S. employees, filed as Exhibit 10.18 to the Registrant's Annual Report on Form 10-K dated March 3, 2015 and incorporated herein by reference.
10.19*	Form of Lydall, Inc. Performance Share Award Agreement (Three-Year Period) for French employees, filed as Exhibit 10.6 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.20*	Form of Lydall, Inc. Performance Share Award Agreement (Three-Year Period) for German employees, filed as Exhibit 10.7 to the Registrant's Form 10-Q dated August 1, 2012 and incorporated herein by this reference.
10.21*	Form of Lydall, Inc. Performance Share Award Agreement (One-Year Period), filed as Exhibit 10.3 to the Registrant's Annual Report on Form 10-K dated February 26, 2010 and incorporated herein by this reference.
10.22	Joinder and Second Amendment and Reaffirmation of Guaranty Agreement, dated July 7, 2016, by and among Lydall, Inc., as borrower, and Bank of America, N.A., as Agent for the Lenders, filed as Exhibit 99.2 to the Registrant's From 8-K dated July 12, 2016 and incorporated herein by reference.
10.23	Amended and Restated Credit Agreement, dated February 18, 2014, by and between Lydall, Inc., as borrower, and Bank of America, N.A., as Agent for the Lenders, filed as Exhibit 10.2 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by this reference, as further amended by Amendment No. 1 to the Amended and Restated Credit Agreement, dated May 5, 2015, filed as Exhibit 99.1 to the Registrant's Form 8-K dated May 6, 2015 and incorporated herein by reference.
10.24	Amended and Restated Guaranty Agreement, dated February 18, 2014, by and among Lydall Thermal/Acoustical, Inc., Lydall Filtration/Separation, Inc., Lydall International, Inc., and Bank of America, N.A., filed as Exhibit 10.3 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference.
10.25	Amended and Restated Security Agreement, dated February 18, 2014, by and between Lydall, Inc., and Bank of America, N.A., filed as Exhibit 10.4 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference, as further amended by that certain Amendment to the Amended and Restated Security Agreements, the Amended and Restated Domain Name Collateral Assignment and Security Agreement and Partial Release dated January 30, 2015, filed as Exhibit 10.34 to the Registrant's Annual Report on From 10-K dated March 3, 2015 and incorporated herein by reference.
10.26	Amended and Restated Security Agreement, dated February 18, 2014, by and between Lydall Thermal/Acoustical, Inc., and Bank of America, N.A., filed as Exhibit 10.5 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference, as further amended by that certain Amendment to the Amended and Restated Security Agreements, the Amended and Restated Domain Name Collateral Assignment and Security Agreement and Partial Release dated January 30, 2015, filed as Exhibit 10.34 to the Registrant's Annual Report on From 10-K dated March 3, 2015 and incorporated herein by reference.
10.27	Amended and Restated Security Agreement, dated February 18, 2014, by and between Lydall Filtration/Separation, Inc., and Bank of America, N.A. filed as Exhibit 10.6 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference.
10.28	Amended and Restated Security Agreement, dated February 18, 2014, by and between Lydall International, Inc., and Bank of America, N.A., filed as Exhibit 10.7 to the Registrant's Form 8-K dated February 24, 2014 and incorporated herein by reference.
10.29	Amendment to the Amended and Restated Security Agreements, the Amended and Restated Domain Name Collateral Assignment and Security Agreement and Partial Release dated January 30, 2015 by and among Lydall, Inc., Lydall Thermal/Acoustical, Inc. and Bank of America, filed as Exhibit 10.34 to the Registrant's Annual Report on Form 10-K dated March 3, 2015 and incorporated herein by reference.
10.30*	

	Amendment No. 1 to the Agreement, dated February 24, 2016, between the Company and Chad A. McDaniel, amending that certain Employment Agreement dated May 8, 2013, filed as Exhibit 10.31 to the Registrant's Annual Report on Form 10-K dated February 24, 2016 and incorporated herein by reference.
10.31*	Amendment No. 1 to the Agreement, dated February 24, 2016, between the Company and Joseph A. Abbruzzi, amending that certain Employment Agreement dated March 31, 2014, filed as Exhibit 10.32 to the Registrant's Annual Report on Form 10-K dated February 24, 2016 and incorporated herein by reference.

10.32*	Amendment No. 1 to the Agreement, dated February 24, 2016, between the Company and James V. Laughlan, amending that certain Employment Agreement dated August 3, 2015, filed as Exhibit 10.33 to the Registrant's Annual Report on Form 10-K dated February 24, 2016 and incorporated herein by reference.
10.33*	Amendment No. 1 to the Agreement, dated February 24, 2016, between the Company and Scott M. Deakin, amending that certain Employment Agreement dated August 21, 2015, filed as Exhibit 10.34 to the Registrant's Annual Report on Form 10-K dated February 24, 2016 and incorporated herein by reference.
14.1	Lydall’s Code of Ethics and Business Conduct, as amended, and the supplemental Code of Ethics for the Chief Executive Officer, Senior Financial Officers and All Accounting and Financial Personnel, as amended, each can be accessed on Lydall’s website at www.lydall.com under the Corporate Governance section.
21.1	List of subsidiaries of the Registrant, filed herewith.
23.1	Consent of PricewaterhouseCoopers LLP, filed herewith.
24.1	Power of Attorney, dated February 16, 2018 authorizing Scott M. Deakin to sign this Annual Report on Form 10-K on behalf of each member of the Board of Directors indicated therein, filed herewith.
31.1	Certification Pursuant to Rule 13a-14(a) and Rule 15d-14(a) under the Securities Exchange Act of 1934 as principal executive officer, filed herewith.
31.2	Certification Pursuant to Rule 13a-14(a) and Rule 15d-14(a) under the Securities Exchange Act of 1934 as principal executive officer, filed herewith.
32.1	Certifications Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, furnished herewith.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

*Management contract or compensatory plan.

Item 16. FORM 10-K SUMMARY

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, Lydall, Inc. has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

LYDALL, INC.

February 21, 2018 By: /s/ Scott M. Deakin
Scott M. Deakin
Executive Vice President and Chief Financial Officer (Principal Financial Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of Lydall, Inc. in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Dale G. Barnhart Dale G. Barnhart	President, Chief Executive Officer and Director (Principal Executive Officer)	February 21, 2018
/s/ Scott M. Deakin Scott M. Deakin	Executive Vice President, Chief Financial Officer (Principal Financial Officer)	February 21, 2018
/s/ James V. Laughlan James V. Laughlan	Vice President, Chief Accounting Officer, and Treasurer (Principal Accounting Officer)	February 21, 2018
/s/ Scott M. Deakin Scott M. Deakin Attorney-in-fact for:		February 21, 2018
Kathleen Burdett	Director	
James Cannon	Director	
Matthew T. Farrell	Director	
Marc T. Giles	Chairman of the Board of Directors	
William D. Gurley	Director	
Suzanne Hammett	Director	
S. Carl Soderstrom, Jr.	Director	

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Stockholders of Lydall, Inc.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Lydall, Inc. and its subsidiaries as of December 31, 2017 and 2016, and the related consolidated statements of operations, of comprehensive income, of changes in stockholders' equity and of cash flows for each of the three years in the period ended December 31, 2017, including the related notes and financial statement schedule listed in the index appearing under Item 15 (a)(2) (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2017, 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, 2017 and December 31, 2016, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2017 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, 2017, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for share-based compensation in 2016.

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 appearing under Item 9A. 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.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP
Hartford, Connecticut
February 21, 2018

We have served as the Company's auditor since 1987.

Lydall, Inc.
CONSOLIDATED STATEMENTS OF OPERATIONS

In thousands except per share data	For the years ended December 31, 2017	2016	2015
Net sales	$698,437	$566,852	$524,505
Cost of sales	535,375	428,310	402,008
Gross profit	163,062	138,542	122,497
Selling, product development and administrative expenses	97,635	83,750	70,020
Operating income	65,427	54,792	52,477
Gain on sale of business	—	—	(18,647)
Interest expense	2,720	1,068	755
Other expense (income), net	1,388	(1,215)	(654)
Income before income taxes	61,319	54,939	71,023
Income tax expense	11,974	17,821	24,764
Loss (income) from equity method investment	28	(69)	—
Net income	$49,317	$37,187	$46,259
Earnings per common share:			
Basic	$2.89	$2.20	$2.76
Diluted	$2.85	$2.16	$2.71
Weighted average common shares outstanding	17,045	16,871	16,746
Weighted average common shares and equivalents outstanding	17,317	17,241	17,084

The accompanying notes are an integral part of these Consolidated Financial Statements.

Lydall, Inc.
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

In thousands	For the years ended December 31, 2017	2016	2015
Net income	$49,317	$37,187	$46,259
Other comprehensive income (loss):			
Change in pension plans, net of income taxes of $409, $1,409, and $55, respectively	2,016	(2,400)	(90)
Foreign currency translation adjustments	25,664	(10,965)	(10,334)
Unrealized gain on hedging activities, net of tax	122	—	—
Total other comprehensive income (loss), net of tax	27,802	(13,365)	(10,424)
Comprehensive income	$77,119	$23,822	$35,835

The accompanying notes are an integral part of these Consolidated Financial Statements.

Lydall, Inc.
CONSOLIDATED BALANCE SHEETS

In thousands of dollars and shares	December 31, 2017	2016
Assets		
Current assets:		
Cash and cash equivalents	$59,875	$71,934
Accounts receivable, (net of allowance for doubtful receivables of $1,507 and $1,429, respectively)	116,712	103,316
Inventories	80,339	66,146
Taxes receivable	5,525	3,883
Prepaid expenses and other current assets	11,044	10,327
Total current assets	273,495	255,606
Property, plant and equipment, net	170,332	160,795
Goodwill	68,969	63,606
Other intangible assets, net	40,543	41,447
Deferred tax assets	1,146	248
Other assets, net	6,386	5,327
Total assets	$560,871	$527,029
Liabilities and Stockholders' Equity		
Current liabilities:		
Current portion of long-term debt	$277	$634
Accounts payable	71,931	56,346
Accrued payroll and other compensation	15,978	14,016
Accrued taxes	2,230	6,460
Other accrued liabilities	11,690	12,988
Total current liabilities	102,106	90,444
Long-term debt	76,913	128,141
Deferred tax liabilities	14,714	15,849
Benefit plan liabilities	9,743	14,729
Other long-term liabilities	3,999	4,410
Commitments and Contingencies (Note 14)		
Stockholders’ equity:		
Preferred stock (par value $0.01 per share; authorized 500 shares; none issued or outstanding) (Note 8)	—	—
Common stock (par value $0.01 per share; authorized 30,000 shares; issued 25,018 and 24,858 shares, respectively) (Note 8)	250	249
Capital in excess of par value	88,006	82,387
Retained earnings	374,783	325,466
Accumulated other comprehensive loss	(20,148)	(47,950)
Treasury stock, 7,675 and 7,626 shares of common stock, respectively, at cost	(89,495)	(86,696)
Total stockholders’ equity	353,396	273,456
Total liabilities and stockholders’ equity	$560,871	$527,029

The accompanying notes are an integral part of these Consolidated Financial Statements.

Lydall, Inc.
CONSOLIDATED STATEMENTS OF CASH FLOWS

	For the years ended December 31,		
In thousands	2017	2016	2015
Cash flows from operating activities:			
Net income	$49,317	$37,187	$46,259
Adjustments to reconcile net income to net cash provided by operating activities:			
Gain on sale of business	—	—	(18,647)
Depreciation and amortization	26,130	19,559	17,275
Inventory step-up amortization	1,108	1,954	—
Long-lived asset impairment charges	772	—	1,354
Deferred income taxes	(2,933)	(1,172)	3,585
Stock-based compensation	4,269	4,359	2,827
Income (loss) from equity method investment	28	(69)	—
Changes in assets and liabilities:			
Accounts receivable	(8,046)	379	(2,749)
Inventories	(11,116)	500	479
Taxes receivable	(1,216)	1,169	276
Prepaid expenses and other assets	(784)	(3,355)	(1,337)
Accounts payable	14,315	3,505	(4,886)
Accrued taxes	(4,708)	1,244	(198)
Accrued payroll and other compensation	1,103	1,770	(3,416)
Benefit plan liabilities	(5,245)	487	(4,778)
Other, net	(58)	2,210	66
Net cash provided by operating activities	62,936	69,727	36,110
Cash flows from investing activities:			
Business acquisitions, net of cash acquired	(323)	(152,242)	—
Capital expenditures	(27,006)	(25,466)	(20,645)
Proceeds from sale of business, net	—	—	28,550
Net cash (used for) provided by investing activities	(27,329)	(177,708)	7,905
Cash flows from financing activities:			
Proceeds from borrowings	—	116,600	—
Debt repayments	(51,762)	(10,328)	(20,571)
Common stock issued	1,323	1,194	1,521
Common stock repurchased	(2,770)	(1,091)	(8,701)
Excess tax benefit on stock awards	—	—	1,044
Net cash (used for) provided by financing activities	(53,209)	106,375	(26,707)
Effect of exchange rate changes on cash	5,543	(2,369)	(3,450)
(Decrease) increase in cash and cash equivalents	(12,059)	(3,975)	13,858
Cash and cash equivalents at beginning of period	71,934	75,909	62,051
Cash and cash equivalents at end of period	$59,875	$71,934	$75,909
Supplemental Schedule for Cash Flow Information			
Cash paid during the year for:			
Interest	$2,747	$787	$632
Income taxes, net	$16,158	$15,739	$20,180

Non-cash capital expenditures of $6.5 million, $8.6 million and $5.9 million were included in accounts payable at December 31, 2017, 2016 and 2015 respectively.

The accompanying notes are an integral part of these Consolidated Financial Statements.

Lydall, Inc.
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY

In thousands of dollars and shares	Common Stock Shares	Common Stock Amount	Capital in Excess of Par Value	Retained Earnings	Accumulated Other Comprehensive Loss	Treasury Stock	Total Stockholders' Equity
Balance at December 31, 2014	24,631	$2,463	$68,961	$242,099	$ (24,161)	$(76,763)	$ 212,599
Net income				46,259			46,259
Other comprehensive loss, net of tax					(10,424)		(10,424)
Stock repurchased						(8,778)	(8,778)
Stock issued under employee plans	91	(2)	1,700				1,698
Excess tax benefit on stock awards			1,044				1,044
Stock-based compensation expense			2,477				2,477
Stock issued to directors	10		350				350
Change in par value		(2,214)	2,214				—
Balance at December 31, 2015	24,732	247	76,746	288,358	(34,585)	(85,541)	245,225
Net income				37,187			37,187
Other comprehensive loss, net of tax					(13,365)		(13,365)
Stock repurchased						(1,155)	(1,155)
Stock issued under employee plans	119	2	1,156				1,158
Stock-based compensation expense			4,009				4,009
Stock issued to directors	7		350				350
Recently adopted accounting standards			126	(79)			47
Balance at December 31, 2016	24,858	249	82,387	325,466	(47,950)	(86,696)	273,456
Net Income				49,317			49,317
Other comprehensive income, net of tax					27,802		27,802
Stock repurchased						(2,799)	(2,799)
Stock issued under employee plans	152	1	1,350				1,351
Stock-based compensation expense			3,868				3,868
Stock issued to directors	8		401				401
Balance at December 31, 2017	25,018	$250	$88,006	$374,783	$ (20,148)	$(89,495)	$ 353,396

The accompanying notes are an integral part of these Consolidated Financial Statements.

Lydall, Inc.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Significant Accounting Policies

Business — Lydall, Inc. and its subsidiaries (the “Company” or “Lydall”) design and manufacture specialty engineered nonwoven filtration media, industrial thermal insulating solutions, and thermal and acoustical barriers for filtration/separation and heat abatement and sound dampening applications.

On July 7, 2016, the Company completed an acquisition of the nonwoven and coating materials businesses primarily operating under the Texel brand (“Texel”) from ADS, Inc. (“ADS”), a Canadian based corporation. The Texel operations manufacture nonwoven needle punch materials and predominantly serve the geosynthetic, liquid filtration, and other industrial markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

On December 31, 2016, the Company completed an acquisition of the nonwoven needle punch materials businesses, operating under the Gutsche (“Gutsche”) brand, a German based corporation. The Gutsche operations manufacture nonwoven needle punch materials and predominantly serve the industrial filtration and high performance nonwoven markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

Principles of consolidation — The Consolidated Financial Statements include the accounts of Lydall, Inc. and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated.

Estimates and assumptions — The preparation of the Company’s Consolidated Financial Statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the financial statement dates and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates.

Risks and uncertainties — Worldwide economic cycles and political changes affect the markets that the Company’s businesses serve and affect demand for Lydall’s products and impact profitability. Among other factors, disruptions in the global credit and financial markets, including diminished liquidity and credit availability, swings in consumer confidence and spending, unstable economic growth and fluctuations in unemployment rates has caused economic instability and can have a negative impact on the Company’s results of operations, financial condition and liquidity.

Cash and cash equivalents — Cash and cash equivalents include cash on hand and highly liquid investments with original maturities of three months or less at the date of purchase.

Concentrations of credit risk — Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents and trade accounts receivable. The Company places its cash and cash equivalents in high-quality financial institutions. Concentrations of credit risk with respect to trade accounts receivable are limited by the large number of customers comprising the Company’s customer base and their dispersion across many different industries and geographies. At December 31, 2017 and 2016, Ford Motor Company ("Ford") represented 12.0% and 14.2% of total accounts receivable, respectively. No other customers accounted for more than 10.0% of total accounts receivable at December 31, 2017 and 2016. Foreign and export sales were 54.2% of the Company’s net sales in 2017, 46.9% in 2016, and 44.2% in 2015. Export sales primarily to Canada, Mexico, Asia and Europe were $55.9 million, $53.2 million, and $52.5 million in 2017, 2016, and 2015, respectively. The Company performs ongoing credit evaluations of its customers’ financial condition and generally does not require collateral. Sales to the automotive market, included in the Thermal/Acoustical Metals and Thermal/Acoustical Fibers segments, were 48.3% of the Company’s net sales in 2017, 56.2% in 2016, and 56.6% in 2015. Sales to Ford were 17.3%, 19.6%,

and 18.2% of Lydall's 2017, 2016, and 2015 net sales, respectively. No other customers accounted for more than 10% of total net sales in 2017, 2016, and 2015.

Inventories — Inventories are valued at lower of cost or net realizable value, cost being determined using the first-in, first-out (FIFO) cost method. Inventories in excess of requirements for current or anticipated orders have been written down to net realizable value.

Pre-production design and development costs — The Company enters into contractual agreements with certain customers to design and develop molds, dies and tools (collectively, "tooling"). All such tooling contracts relate to parts

that the Company will supply to customers under long-term supply agreements. Tooling costs are accumulated in work-in process inventory and are charged to operations as the related revenue from the tooling is recognized. Revenue is recognized as tooling is delivered and accepted by the customer. The Company also may progress bill on certain tooling being constructed. These billings are recorded as progress billings (a reduction of the associated work-in-process inventory) until the appropriate revenue recognition criteria have been met.

Periodically, the Company enters into contractually guaranteed reimbursement arrangements as a mechanism to collect amounts due from customers from tooling sales. Under these arrangements, amounts due from tooling sales are collected as parts are delivered over the part supply arrangement, in accordance with the specific terms of the arrangement. The amounts due from the customer in such transactions are recorded in “Prepaid expenses and other current assets” or “Other assets, net” based upon the expected term of the reimbursement arrangement.

The following tooling related assets were included in the Consolidated Balance Sheets as of December 31, 2017 and 2016:

	December, 31	
In thousands	2017	2016
Inventories, net of progress billings and reserves	$18,540	$9,388
Prepaid expenses and other current assets	281	258
Total tooling related assets	$18,821	$9,646

Amounts included in “Prepaid expenses and other current assets” include the short-term portion of receivables due under contractually guaranteed reimbursement arrangements. Included in the inventory balance was an offset for progress billings of $1.7 million and $0.9 million at December 31, 2017 and 2016, respectively. Company owned tooling is recorded in “Property, plant and equipment, net” at December 31, 2017 and December 31, 2016.

Property, plant and equipment — Property, plant, and equipment are stated at cost. Assets held under capital leases are recorded at the lower of the net present value of the minimum lease payments or the fair value of the leased asset at the inception of the lease. Property, plant and equipment, including property, plant and equipment under capital leases, are depreciated over their estimated useful lives using the straight-line method. Leasehold improvements are depreciated on a straight-line basis over the term of the lease or the life of the asset, whichever is shorter. The cost and accumulated depreciation amounts applicable to assets sold or otherwise disposed of are removed from the asset and accumulated depreciation accounts and any net gain or loss is included in the Consolidated Statements of Operations. Expenses for maintenance and repairs are charged to expense as incurred.

Goodwill and other intangible assets — Goodwill represents costs in excess of fair values assigned to the underlying net assets of acquired companies. Goodwill and other intangible assets with indefinite lives are not amortized but are subject to annual impairment tests. All other intangible assets are amortized over their estimated useful lives, which range from 4 to 14 years. In performing impairment tests, the Company considers discounted cash flows and other market factors as best evidence of fair value. There are inherent uncertainties and management judgment required in these analyses.

Valuation of long-lived assets — The Company evaluates the recoverability of long-lived assets, or asset groups, whenever events or changes in circumstances indicate that carrying amounts may not be recoverable. Should such evaluations indicate that the related future undiscounted cash flows are not sufficient to recover the carrying values of the assets, such carrying values would be reduced to fair value and this adjusted carrying value would become the assets’ new cost basis. For long-lived assets held for sale, assets are written down to fair value, less costs to sell.

Fair value is determined primarily using future anticipated cash flows that are directly associated with, and that are expected to arise as a direct result of the use and eventual disposition of the asset, or asset group, as well as market conditions and other factors. There are inherent uncertainties and management judgment required in these analyses.

Contingencies and environmental obligations — The Company makes judgments and estimates in accordance with applicable accounting rules when it establishes reserves for legal proceedings, claims, investigations, environmental obligations and other contingent matters. Provisions for such matters are charged to expense when it is probable that a liability has been incurred and reasonable estimates of the liability can be made. Estimates of environmental liabilities are based on a variety of matters, including, but not limited to, the stage of investigation, the stage of the remedial design, evaluation of existing remediation technologies, and presently enacted laws and

regulations. The amount and timing of all future expenses related to legal proceedings, claims, investigations, environmental obligations and other contingent matters may vary significantly from estimates.

Employer sponsored benefit plans — The Company recognizes the funded status of its domestic defined benefit pension plan. Net benefit obligations are calculated based on actuarial valuations using key assumptions related to discount rates, mortality rates and expected return on plan assets.

Derivative instruments — Derivative instruments are measured at fair value and recognized as either assets or liabilities on the Consolidated Balance Sheet in either current or non-current other assets or other accrued liabilities or other long-term liabilities depending upon maturity and commitment. For derivative instruments that are designated and qualify as a fair value hedge, the gain or loss on the derivative as well as the offsetting loss or gain on the hedged item attributable to the hedged risk are recognized in the Consolidated Statement of Operations. For derivative instruments that are designated and qualify as a cash flow hedge, the effective portion of the gain or loss on the derivative is reported as a component of other comprehensive income and reclassified into earnings in the same period or periods in which the hedge transaction affects earnings. The Company selectively uses financial instruments to manage market risk associated with exposure to fluctuations in interest rates and foreign currency rates. These financial exposures are monitored and managed by the Company as an integral part of its risk management program. The Company does not engage in derivative instruments for speculative or trading purposes. Lydall has historically not been a party to a significant number of derivative instruments.

Revenue recognition — The Company recognizes revenue (1) once evidence of an arrangement exists; (2) product delivery has occurred; (3) pricing is fixed or determinable; and (4) collection is reasonably assured. The four criteria required to recognize revenue are considered to be met, and the passage of title to the customer occurs, at the respective FOB point and, therefore, revenue is recognized at that time. The Company’s standard sales and shipping terms are FOB shipping point, therefore, substantially all revenue is recognized upon shipment. However, the Company conducts business with certain customers on FOB destination terms and in these instances revenue is recognized upon receipt by the customer. The Company generally does not provide specific customer inspection or acceptance provisions in its sales terms, with the exception of tooling sales discussed in “Pre-production design and development costs” above.

Sales returns and allowances are recorded as identified or communicated by the customer and internally approved. The Company does not provide customers with general rights of return for products sold; however, in limited circumstances, the Company will allow sales returns and allowances from customers if the products sold do not conform to specifications.

Shipping and handling costs consist primarily of costs incurred to deliver products to customers and internal costs related to preparing products for shipment and are recorded in cost of sales. Amounts billed to customers as shipping and handling are classified as revenue.

Research and development — Research and development costs are charged to expense as incurred and amounted to $10.8 million in 2017, $9.0 million in 2016, and $8.5 million in 2015. Research and development costs were primarily comprised of development personnel salaries, prototype material costs and testing and trials of new products.

Earnings per share — Basic earnings per common share are equal to net income divided by the weighted average number of common shares outstanding during the period. Diluted earnings per common share are equal to net income divided by the weighted average number of common shares outstanding during the period, including the effect of stock options and stock awards, if such effect is dilutive.

Income taxes — The provision for income taxes is based upon income reported in the accompanying Consolidated Financial Statements. Deferred income taxes reflect the impact of temporary differences between the amounts of

income and expense recognized for financial reporting purposes and such amounts recognized for tax purposes. In the event the Company was to determine that it would not be able to realize all or a portion of its deferred tax assets in the future, the Company would record a valuation allowance through a charge to income in the period that such determination was made. Conversely, if the Company was to determine that it would be able to realize its deferred tax assets in the future in excess of the net carrying amounts, the Company would decrease the recorded valuation allowance and record an increase to income in the period that such determination was made. See Note 13 to the consolidated financial statements for additional provision items recorded in regards to the Tax Cuts and Jobs Act (the "Tax Reform Act").

Translation of foreign currencies — Assets and liabilities of foreign subsidiaries are translated at exchange rates prevailing on the balance sheet date. Revenues and expenses are translated at average exchange rates prevailing during the period. Any resulting translation gains or losses are reported in other comprehensive income (loss).

Stock options and share grants — The Company accounts for awards of equity instruments under the fair value method of accounting and recognizes such amounts in the Consolidated Statements of Operations. The Company recognizes expense on a straight-line basis over the vesting period of the entire award. Prior to January 1, 2016, stock-based compensation expense included estimated effects of forfeitures. Upon adoption of ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, in 2016, an accounting policy election was made to account for forfeitures as they occur. As a result of the adoption of this ASU, the Company recognized excess tax benefits from stock award exercises and vesting as a discrete tax benefit during the years ended December 31, 2017 and December 31, 2016. The Company applied these changes prospectively, and therefore the year ending December 31, 2015 was not adjusted. The Company estimates the fair value of option grants based on the Black Scholes option-pricing model. Expected volatility and expected term are based on historical information. The calculation assumes that future volatility and expected term are not likely to materially differ from the Company’s historical stock price volatility and historical exercise data, respectively. Compensation expense for all restricted stock awards is recorded based on the market value of the stock on the grant date and recognized as expense over the vesting period of the award. Compensation expense for performance-based restricted stock is also impacted by the probability of achieving the performance targets.

Recently Adopted Accounting Standards

Effective January 1, 2017, the Company adopted the Financial Accounting Standards Board ("FASB") Accounting Standards Update ("ASU") No. 2015-11, “Inventory” (Topic 330): Simplifying the Measurement of Inventory." This ASU requires an entity to measure inventory at the lower of cost and net realizable value. Net realizable value is the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal, and transportation. Subsequent measurement is unchanged for inventory measured using last-in, first-out (“LIFO”) or the retail inventory method. The adoption of this ASU did not have any impact on the Company’s consolidated financial statements.

2. Acquisitions and Divestitures

Acquisitions

On December 31, 2016, the Company completed an acquisition of the nonwoven needle punch materials businesses, which include MGF Gutsche & Co GmbH KG, FRG and Gutsche Environmental Technology (Yixing) Co. Ltd., China, operating under Gutsche (“Gutsche”), a German based corporation. The Gutsche operations manufacture nonwoven needle punch materials and predominantly serve the industrial filtration and high performance nonwoven markets. The Company acquired one hundred percent of Gutsche for $57.6 million, net of a receivable of $3.0 million related to an estimated post-closing purchase price adjustment. In the second quarter of 2017, the Company finalized the post closing adjustment resulting in an increase in the purchase price of $0.4 million resulting in a final purchase price of $58.0 million. The purchase price was financed with a combination of cash on hand and $31.6 million of borrowings through the Company's amended $175 million credit facility. The operating results of the Gutsche business have been included in the Consolidated Statements of Operations since December 31, 2016, the date of the acquisition, and are reported within the Technical Nonwovens segment.

For the year ended December 31, 2017, Gutsche reported net sales and operating income of $51.5 million and $2.9 million, respectively. Operating income for the year ended December 31, 2017 included $0.6 million of purchase accounting inventory fair value step-up adjustments in cost of sales upon the sale of inventory and $0.2 million of restructuring expenses. There were no sales or operating income for Gutsche during the year ended December 31,

2016 as the acquisition occurred on December 31, 2016.

On July 7, 2016, the Company completed an acquisition of the nonwoven and coating materials businesses primarily operating under Texel from ADS, a Canadian based corporation. The Texel operations manufacture nonwoven needle punch materials and predominantly serve the geosynthetic, liquid filtration, and other industrial markets. The Company acquired one hundred percent of Texel for $102.7 million in cash, including a post-closing working capital adjustment. The purchase price was financed with a combination of cash on hand and $85.0 million of borrowings through the Company’s amended $175 million credit facility. As part of the acquisition, the Company acquired a fifty percent interest in a joint venture, Afitex Texel Geosynthetiques, Inc., with a fair value of $0.6 million. The joint venture is accounted

for under the equity method of accounting. The operating results of the Texel business have been included in the Consolidated Statements of Operations since July 7, 2016, the date of the acquisition, and are reported within the Technical Nonwovens segment.

For the year ended December 31, 2017, Texel reported net sales and operating income of $84.8 million and $6.9 million, respectively. Operating income for the year ended December 31, 2017 included $0.5 million of purchase accounting inventory fair value step-up adjustments in cost of sales upon the sale of inventory.

From the date of the acquisition through December 31, 2016, Texel reported net sales and operating income of $40.9 million and $2.5 million, respectively. Operating income from the date of the acquisition through the year ended December 31, 2016 included $2.0 million of purchase accounting inventory fair value step-up adjustments in cost of sales upon the sale of inventory.

During the year ended December 31, 2017 and 2016 the Company incurred $0.1 million and $3.7 million, respectively, of acquisition related costs related to the acquisitions of Texel and Gutsche. These transaction costs include legal fees and other professional services fees to complete the transaction. These corporate office expenses have been recognized in the Company's Condensed Consolidated Statements of Operations as selling, product development and administrative expenses.

The following table summarizes the fair values of identifiable assets acquired and liabilities assumed at the date of the Texel and Gutsche acquisitions:

In thousands	Texel	Gutsche
Cash and cash equivalents	$1,610	$9,400
Accounts Receivable	13,355	7,736
Inventories	17,525	6,417
Prepaid expenses and other current assets	2,469	1,125
Non-current environmental indemnification receivable (Note 14)	925	—
Property, plant and equipment, net	31,525	7,969
Investment in joint venture	616	—
Goodwill (Note 5)	28,655	19,729
Other intangible assets, net (Note 5)	22,887	15,622
Other long-term assets	—	1,545
Total assets acquired	119,567	69,543
Current liabilities	(8,520)	(8,376)
Long-term environmental remediation liability (Note 14)	(925)	—
Other long-term liabilities	—	(2,742)
Deferred tax liabilities	(7,413)	(470)
Total liabilities assumed	(16,858)	(11,588)
Net assets acquired	$102,709	$57,955

The final purchase price allocation related to Texel reflects post-closing adjustments pursuant to the terms of the Stock Purchase Agreement. The final purchase price allocation related to Gutsche reflects post-closing adjustments pursuant to the terms of the Gutsche Share Purchase Agreement.

The following table reflects the results of the Company for the year ended December 31, 2017 and the unaudited pro forma operating results of the Company for years ended December 31, 2016 and 2015, which give effect to the acquisitions of Texel and Gutsche as if they had occurred on January 1, 2015. The pro forma information includes the historical financial results of the Company and the acquired businesses. The pro forma results are not necessarily indicative of the operating results that would have occurred had the acquisition been effective January 1, 2015, nor are

they intended to be indicative of results that may occur in the future. The pro forma information does not include the effects of any synergies related to the acquisitions.

	For The Years Ended December 31,		
	(Actual)	(Unaudited Pro Forma)	(Unaudited Pro Forma)
In thousands	2017	2016	2015
Net Sales	$698,437	$ 654,877	$ 651,252
Net Income	$49,317	$ 43,559	$ 47,956
Earnings per share:			
Basic	$2.89	$ 2.58	$ 2.86
Diluted	$2.85	$ 2.53	$ 2.81

Included in earnings during the year ended December 31, 2017 was $3.9 million of amortization expense, $1.1 million of fair value step-up adjustments to inventory and acquisition related expenses of $0.1 million related to Texel and Gutsche.

Pro forma earnings during the year ended December 31, 2016 were adjusted to exclude non-recurring items such as acquisition-related costs of $4.3 million and expense related to the fair value adjustment to inventory of $2.0 million. No amount was included in the pro forma earnings during the year ended December 31, 2016 related to inventory fair value adjustments which would have been recognized in cost of sales as the corresponding inventory would have been completely sold during 2015. Pro forma earnings during the year ended December 31, 2016 were adjusted to include additional expense of $3.9 million related to the amortization of the acquired intangible assets recognized at fair value in purchase accounting, additional depreciation expense of $1.2 million resulting from increased basis of property, plant and equipment, and additional interest expense of $0.8 million associated with borrowings under the Company’s Amended Credit Facility. Customer freight billings of $0.9 million were reclassed from costs of sales to net sales for the year ended December 31, 2016.

Pro forma earnings during the year ended December 31, 2015 were adjusted to include acquisition-related costs of $0.8 million, expense of $3.2 million related to the amortization of the fair value adjustments to inventory, $3.5 million of additional amortization of the acquired intangible assets recognized at fair value in purchase accounting, additional depreciation expense of $2.1 million resulting from increased basis of property, plant and equipment, as well as $1.2 million of interest expense associated with borrowings under the Company’s Amended Credit Facility. Customer freight billings of $1.6 million were reclassed from costs of sales to net sales for the year ended December 31, 2015.

Divestiture

On January 30, 2015, the Company sold all of the outstanding shares of common stock of its Life Sciences Vital Fluids business, reported as Other Products and Services, for a cash purchase price of $30.1 million. The disposition was completed pursuant to a Stock Purchase and Sale Agreement, dated January 30, 2015, by and among the Company, and the buyer. The Company recognized a pre-tax gain on the sale of $18.6 million, reported as non-operating income in the first quarter of 2015. Net of income taxes, the Company reported a gain on sale of $11.8 million.

In accordance with the revised accounting guidance for reporting discontinued operations, the Company did not report Life Sciences Vital Fluids as a discontinued operation as it would not be considered a strategic shift in Lydall's business. Accordingly, the operating results of Life Sciences Vital Fluids are included in the operating results of the Company through the sale date in 2015.

3. Inventories

Inventories as of December 31, 2017 and 2016 were as follows:

	December 31,	
In thousands	2017	2016
Raw materials	$28,672	$24,518
Work in process	29,427	17,161
Finished goods	23,901	25,360
	82,000	67,039
Less: Progress billings	(1,661)	(893)
Total inventories	$80,339	$66,146

Included in work in process is gross tooling inventory of $20.2 million and $10.3 million at December 31, 2017 and 2016, respectively. Tooling inventory, net of progress billings, was $18.5 million and $9.4 million at December 31, 2017 and 2016, respectively.

4. Property, Plant and Equipment, Net

Property, plant and equipment as of December 31, 2017 and 2016 were as follows:

	Estimated	December 31,	
In thousands	Useful Lives	2017	2016
Land	–	$4,289	$3,981
Buildings and improvements	10-35 years	84,337	74,397
Machinery and equipment	5-25 years	254,881	226,675
Office equipment	2-8 years	33,880	31,504
Vehicles	3-6 years	1,706	1,553
Assets under capital leases:			
Land	–	241	226
Buildings and improvements	10-35 years	221	4,806
Machinery and equipment	5-25 years	1,051	—
Office equipment	2-8 years	34	—
		380,640	343,142
Accumulated depreciation		(226,581)	(196,251)
Accumulated depreciation of capital leases		(239)	(2,915)
		153,820	143,976
Construction in progress		16,512	16,819
Total property, plant and equipment, net		$170,332	$160,795

Depreciation expense was $21.4 million in 2017, $17.8 million in 2016, and $16.4 million in 2015.

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5. Goodwill and Long-Lived Assets

Gross and net carrying amounts of goodwill at December 31, 2017 and 2016 were as follows:

In thousands	Performance Materials	Technical Nonwovens	Thermal/ Acoustical Metals	Totals
Goodwill	$ 12,777	$ 50,829	$ 12,160	$75,766
Accumulated amortization/impairment	—	—	(12,160)	(12,160)
Balance at December 31, 2016	12,777	50,829	—	63,606
Goodwill	13,307	55,662	12,160	81,129
Accumulated amortization/impairment	—	—	(12,160)	(12,160)
Balance at December 31, 2017	$ 13,307	$ 55,662	$ —	$68,969

The changes in the carrying amounts of goodwill in 2017 and 2016 were as follows:

In thousands	Performance Materials	Technical Nonwovens	Totals
Balance at January 1, 2016	$ 12,898	$ 3,943	$16,841
Goodwill addition	—	47,987	47,987
Currency translation adjustment	(121)	(1,101)	(1,222)
Balance at December 31, 2016	12,777	50,829	63,606
Goodwill adjustment	—	323	323
Currency translation adjustment	530	4,510	5,040
Balance at December 31, 2017	$ 13,307	$ 55,662	$68,969

Goodwill Associated with Acquisitions and Divestitures

The goodwill adjustment of $0.3 million in 2017 within the Technical Nonwovens segment is the result of the final post-closing adjustments related to the acquisition of Gutsche on December 31, 2016.

The goodwill addition of $48.0 million in 2016 within the Technical Nonwovens segment results from the acquisitions of Texel on July 7, 2016 and Gutsche on December 31, 2016. The amount allocated to goodwill is reflective of the benefits the Company expects to realize from its entrance into the geosynthetic market, expansion in the liquid filtration and other industrial markets and Texel's and Gutsche's assembled workforce. None of the goodwill associated with the Texel acquisition is expected to be deductible for income tax purposes. Of the $22.3 million of goodwill associated with the Gutsche acquisition at December 31, 2017, $19.0 million is expected to be deductible for income tax purposes.

Goodwill Impairment Testing

During the fourth quarter of 2017, the Company performed its annual impairment analysis of the $13.3 million of goodwill in the Performance Materials reporting unit (PM reporting unit) and $55.7 million in the Technical Nonwovens reporting unit. The Company used the qualitative method to analyze the goodwill for the Performance Materials and Technical Nonwovens reporting units. When considering capital markets environment, economic conditions, industry trends, results of operations, and other factors, the Company concluded that it is not more likely than not that the fair value of each reporting unit was less than its carrying amount. For the Performance Materials reporting unit the Company also considered changes in assumptions used in the Company's most recent quantitative annual testing, including results of operations, the magnitude of excess of fair value over carrying value and other factors. As a result, the Company concluded that the Performance Materials and Technical Nonwovens reporting units' goodwill was not impaired.

Other Intangible Assets

The table below presents the gross carrying amount and, as applicable, the accumulated amortization of the Company's acquired intangible assets other than goodwill included in "Other intangible assets, net" in the Consolidated Balance Sheets as of December 31, 2017 and 2016:

	December 31, 2017		December 31, 2016	
In thousands	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Amortized intangible assets				
Customer relationships	$39,474	$ (4,460)	$36,131	$ (1,284)
Patents	4,504	(3,821)	4,028	(3,300)
Technology	2,500	(644)	2,500	(477)
Trade names	4,288	(1,461)	3,912	(394)
License agreements	640	(640)	583	(583)
Other	586	(423)	536	(205)
Total amortized intangible assets	$51,992	$ (11,449)	$47,690	$ (6,243)

In connection with the acquisition of Texel on July 7, 2016, the Company recorded intangible assets of $22.9 million, which included $20.8 million of customer relationships and $2.1 million of trade names. As of December 31, 2017, the weighted average useful lives of the Texel intangible assets was 12 years.

In connection with the acquisition of Gutsche on December 31, 2016, the Company recorded intangible assets of $15.6 million, which included $13.8 million of customer relationships, $1.7 million of trade names and $0.1 million of backlog. As of December 31, 2017, the weighted average useful lives of the Gutsche intangible assets was 11 years.

Amortization of all intangible assets for the years ended December 31, 2017, 2016, and 2015 was $4.5 million, $1.5 million, and $0.8 million, respectively. The increase in amortization expense during 2017, compared to 2016, was primarily due to the acquisitions of Texel and Gutsche. Estimated amortization expense for intangible assets is expected to be $6.0 million, $5.7 million, $5.3 million, $4.5 million and $3.8 million for each of the years ending December 31, 2018 through 2022, respectively. As of December 31, 2017, the weighted average useful life of intangible assets was approximately 11 years.

Impairment of Long-Lived Assets

During the first quarter of 2017, the Company tested for impairment a discrete long-lived asset group in the Performance Materials segment with a carrying value of $1.3 million, as a result of indicators of possible impairment. To determine the recoverability of this asset group, the Company completed an undiscounted cash flow analysis and compared it to the asset group carrying value. This analysis was primarily dependent on the expectations for net sales over the estimated remaining useful life of the underlying asset group. The impairment test concluded that the asset group was not recoverable as the resulting undiscounted cash flows were less than their carrying amount. Accordingly, the Company determined the fair value of the asset group to assess if there was an impairment. Determining fair value is judgmental in nature and requires the use of significant estimates and assumptions considered to be Level 3 inputs. To determine the estimated fair value of the asset group the Company used the market approach. Under the market approach, the determination of fair value considered market conditions including an independent appraisal of the components of the asset group. The estimated fair value of the asset group was $0.5 million, below its carrying value of $1.3 million, which resulted in a long-lived asset impairment charge of $0.8 million included in selling, product development and administrative expenses during the quarter ended March 31, 2017. This long-lived asset group, with a net book value of $0.5 million, is classified as held for sale as of December 31, 2017.

6. Long-term Debt and Financing Arrangements

On July 7, 2016, the Company amended its $100.0 million senior secured revolving credit facility (“Amended Credit Facility”) which increased the available borrowing from $100 million to $175 million, added a fourth lender and extended the maturity date to July 7, 2021. The Amended Credit Facility is secured by substantially all of the assets of the Company. Under the terms of the Amended Credit Facility, the lenders are providing a $175 million revolving credit facility to the Company, under which the lenders may make revolving loans and issue letters of credit to or for the

benefit of the Company and its subsidiaries. The Company may request the Amended Credit Facility be increased by an aggregate amount not to exceed $50 million through an accordion feature, subject to specified conditions set forth in the Amended Credit Facility.

The Amended Credit Facility contains a number of affirmative and negative covenants, including financial and operational covenants. The Company is required to meet a minimum interest coverage ratio. The interest coverage ratio requires that, at the end of each fiscal quarter, the ratio of consolidated EBIT to Consolidated Interest Charges, both as defined in the Amended Credit Facility, may not be less than 2.0 to 1.0 for the immediately preceding 12 month period. In addition, the Company must maintain a Consolidated Leverage Ratio, as defined in the Amended Credit Facility, as of the end of each fiscal quarter of no greater than 3.0 to 1.0. The Company must also meet minimum consolidated EBITDA as of the end of each fiscal quarter for the preceding 12 month period of $30.0 million. The Company was in compliance with all covenants during 2017 and at December 31, 2017.

Interest is charged on borrowings at the Company’s option of either: (i) Base Rate plus the Applicable Rate, or (ii) the Eurodollar Rate plus the Applicable Rate. The Base Rate is a fluctuating rate equal to the highest of (a) the federal funds rate plus 0.50%, (b) the prime rate as set by Bank of America, and (c) the Eurocurrency Rate plus 1.00%. The Eurocurrency Rate means (i) if denominated in LIBOR quoted currency, a fluctuating LIBOR per annum rate equal to the London Interbank Offered Rate; (ii) if denominated in Canadian Dollars, the rate per annum equal to the Canadian Dealer Offered Rate; or (iii) the rate per annum as designated with respect to such alternative currency at the time such alternative currency is approved by the Lenders. The Applicable Rate is determined based on the Company’s Consolidated Leverage Ratio (as defined in the Amended Credit Agreement). The Applicable Rate added to the Base Rate Committed Loans ranges from 15 basis points to 100 basis points, and the Applicable Rate added to Eurocurrency Rate Committed Loans and Letters of Credit ranges from 75 basis points to 175 basis points. The Company pays a quarterly fee ranging from 17.5 basis points to 30 basis points on the unused portion of the $175 million available under the Amended Credit Facility.

In April 2017, the Company entered into a three-year interest rate swap agreement with a bank which converts the interest on the first notional $60.0 million of the Company's one-month LIBOR-based borrowings under its Amended Credit Facility from a variable rate, plus the borrowing spread, to a fixed rate of 1.58% plus the borrowing spread. The notional amount reduces quarterly by $5.0 million through March 31, 2020. The Company is accounting for the interest rate swap agreement as a cash flow hedge. Effectiveness of this derivative agreement is assessed quarterly by ensuring that the critical terms of the swap continue to match the critical terms of the hedged debt.

At December 31, 2017, the Company had borrowing availability of $94.5 million under the Amended Credit Facility net of $76.6 million of borrowings outstanding and standby letters of credit outstanding of $3.9 million.

In addition to the amounts outstanding under the Amended Credit Facility, the Company has various acquired foreign credit facilities totaling approximately $9.8 million. At December 31, 2017, the Company's foreign subsidiaries had $0.1 million in borrowings outstanding as well as $2.8 million in standby letters of credit outstanding.

The Company also has capital lease agreements for machinery and equipment at multiple operations requiring monthly principal and interest payments through 2020.

Total outstanding debt consists of:

			December 31,	
In thousands	Effective Rate	Maturity	2017	2016
Revolver Loan, due July 7, 2021	2.57%	2021	$76,600	$126,600
Other Foreign Bank Borrowings	0.80% - 3.40%	2017	—	1,430
Capital Leases	1.65% - 2.09%	2019 - 2020	590	745
			77,190	128,775

Less portion due within one year	(277)	(634)
Total long-term debt	$76,913	$128,141

As of December 31, 2017, total debt maturing in 2018, 2019, and 2021 is $0.3 million, $0.3 million, and $76.6 million, respectively.

The weighted average interest rate on long-term debt was 2.2% for the year ended December 31, 2017, compared with 1.4% and 1.3% for the years ended December 31, 2016 and 2015, respectively.

The fair values of the Company’s long-term debt are determined using discounted cash flows based upon the Company’s estimated current interest cost for similar type borrowings or current market value, which falls under Level 2 of the fair value hierarchy. The carrying values of the long-term debt approximate fair market value.

7. Derivatives

The Company selectively uses financial instruments to manage market risk associated with exposure to fluctuations in interest rates and foreign currency rates. These financial exposures are monitored and managed by the Company as an integral part of its risk management program. The Company’s interest rate exposure is most sensitive to fluctuations in interest rates in the United States and Europe, which impact interest paid on its debt. The Company has debt with variable rates of interest based generally on LIBOR. From time to time, the Company may enter into interest rate swap agreements to manage interest rate risk. These instruments are designated as cash flow hedges and are recorded at fair value using Level 2 observable market inputs.

Derivative instruments are recognized as either assets or liabilities on the balance sheet in either current or non-current other assets or other accrued liabilities or other long-term liabilities depending upon maturity and commitment. For derivative instruments that are designated and qualify as a cash flow hedge, the effective portion of the gain or loss on the derivative is reported as a component of other comprehensive income and reclassified into earnings in the same period or periods in which the hedge transaction affects earnings. Any ineffective portion, or amounts related to contracts that are not designated as hedges, are recorded directly to earnings. The Company's policy for classifying cash flows from derivatives is to report the cash flows consistent with the underlying hedged item. The Company does not use derivatives for speculative or trading purposes.

In April 2017, the Company entered into a three-year interest rate swap agreement with a bank which converts the interest on the first notional $60.0 million of the Company's one-month LIBOR-based borrowings under its Amended Credit Facility from a variable rate, plus the borrowing spread, to a fixed rate of 1.58% plus the borrowing spread. The notional amount reduces quarterly by $5.0 million through March 31, 2020. The interest rate swap agreement was accounted for as cash flow hedge. Effectiveness of this derivative agreement is assessed quarterly by ensuring that the critical terms of the swap continue to match the critical terms of the hedged debt.

The following table sets forth the fair value amounts of derivative instruments held by the Company:

In thousands	December 31, 2017		December 31, 2016	
	Asset Derivatives	Liability Derivatives	Asset Derivatives	Liability Derivatives
Derivatives designated as hedging instruments:				
Interest rate contract	$ 157	$ —	$ —	$ —
Total derivatives	$ 157	$ —	$ —	$ —

The following table sets forth the income, recorded in accumulated other comprehensive income, net of tax, for the quarters and twelve months ended December 31, 2017 and 2016 for derivatives held by the Company and designated as hedging instruments:

	Quarter Ended December 31,	Twelve Months Ended December 31,

	2017	2016	2017	2016
Cash flow hedges:				
Interest rate contract	$ 129	$ —	$ 122	$ —
	$ 129	—	$ 122	$ —

8. Capital Stock

Preferred Stock — The Company has authorized Preferred Stock with a par value of $0.01. None of the 500,000 authorized shares have been issued.

Common Stock — As of December 31, 2017, 10,214 Lydall stockholders of record held 17,343,839 shares of Common Stock.

Dividend policy — The Company does not pay a cash dividend on its common stock. The Company's Amended Credit Facility does not place any restrictions on cash dividend payments, so long as the payments do not place the Company in default.

9. Employer Sponsored Benefit Plan

The Company maintains a domestic defined benefit pension plan, which covers certain domestic Lydall employees, is noncontributory and benefits are based on either years of service or eligible compensation paid while a participant is in a plan. The plan has been closed to new employees for several years and benefits under the pension plan are no longer accruing. The Company's funding policy for its domestic defined benefit pension plan is to fund not less than the ERISA minimum funding standard and not more than the maximum amount that can be deducted for federal income tax purposes.

Plan assets and benefit obligations of the domestic defined benefit pension plan are as follows:

	December 31,	
In thousands	2017	2016
Change in benefit obligation:		
Net benefit obligation at beginning of year	$50,086	$48,081
Interest cost	2,058	2,139
Actuarial loss	2,126	2,062
Gross benefits paid	(2,388)	(2,196)
Net benefit obligation at end of year	$51,882	$50,086
Change in plan assets:		
Fair value of plan assets at beginning of year	$37,038	$35,413
Actual return on plan assets	5,924	221
Contributions	3,600	3,600
Gross benefits paid	(2,388)	(2,196)
Fair value of plan assets at end of year	$44,174	$37,038
Net benefit obligation in excess of plan assets	$(7,708)	$(13,048)
Balance sheet amounts:		
Noncurrent liabilities	$(7,708)	$(13,048)
Total liabilities	$(7,708)	$(13,048)
Amounts recognized in accumulated other comprehensive income, net of tax consist of:		
Net actuarial loss	$17,632	$19,689
Net amount recognized	$17,632	$19,689

At December 31, 2017, in addition to the accrued benefit liability of $7.7 million recognized for the Company's domestic defined benefit pension plan, the Company also had foreign regulatory labor agreements with an accrued benefit liability of $1.9 million and accumulated other comprehensive loss, net of tax, of $0.4 million. At December 31, 2016, in addition to the accrued benefit liability of $13.0 million recognized for the Company's domestic defined benefit pension plan, the Company also had foreign regulatory labor agreements with an accrued benefit liability of $1.5 million and accumulated other comprehensive loss, net of tax, of $0.4 million.

The domestic defined benefit pension plan liability, net of tax, included in other comprehensive income decreased by $2.1 million for the year ended December 31, 2017. The domestic defined benefit pension plan liability, net of tax, included in other comprehensive income increased by $2.4 million for the year ended December 31, 2016. These changes are mainly due to changes in pension assumptions, primarily the discount rates.

Aggregated information for the domestic defined benefit pension plan with an accumulated benefit obligation in excess of plan assets is provided in the tables below:

	December 31,	
In thousands	2017	2016
Projected benefit obligation	$51,882	$50,086
Accumulated benefit obligation	$51,882	$50,086
Fair value of plan assets	$44,174	$37,038

Components of net periodic benefit cost for the domestic pension plan:

	December 31,		
In thousands	2017	2016	2015
Interest cost	$2,058	$2,139	$2,066
Expected return on plan assets	(2,376)	(2,419)	(2,360)
Amortization of actuarial net loss	1,092	933	897
Total net periodic benefit cost	$774	$653	$603

It is estimated that $1.0 million of actuarial net loss will be amortized from accumulated other comprehensive loss into net periodic benefit costs for the domestic pension plan in 2018.

The major assumptions used in determining the year-end benefit obligation and annual net cost for the domestic pension plan are presented in the following table:

	Benefit Obligation		Net Cost		
For the years ended December 31,	2017	2016	2017	2016	2015
Discount rate	3.71%	4.21%	4.21%	4.56%	4.16%
Expected return on plan assets	5.80%	6.30%	6.30%	7.00%	7.25%

Plan Assets

The domestic defined benefit pension plan is administered by the Lydall Retirement Committee (the "Committee"), which is appointed by the Board of Directors. The Committee’s responsibilities are to establish a funding policy for the Lydall Pooled Pension Investment Trust (“the Trust”) and to appoint and oversee the investment advisor responsible for the Trust’s investments. The Committee is a named fiduciary under the plan, and the Committee has granted discretion to the investment advisor with respect to management of the Trust’s investments. The assets of the domestic defined benefit pension plan are invested in the Trust for the purpose of investment diversification. In determining the expected return on plan assets, the Committee considers the relative weighting of plan assets, the historical performance of marketable debt and equity securities and economic and other indicators of future performance.

Investment management objectives include maintaining an adequate level of diversification to balance market risk and to provide sufficient liquidity for near-term payments of benefits accrued under the domestic pension plan and to pay the expenses of administration. The long-term investment objective of the Trust is to achieve a total return equal to or greater than the Trust’s actuarially assumed rate of return, currently 5.80%. Though it is the intent of the Committee to achieve income and growth, that intent does not include taking extraordinary risks or engaging in investment activities not commonly considered prudent under the standards imposed by ERISA. The Committee defines risk as the probability of not meeting the Trust’s objectives and the probability of not meeting the Trust’s liability requirements.

The allowable investments include: securities, mutual funds, sub-advisers, independent investment managers and/or programs, and cash or cash equivalents. Prohibited investments include: single strategy hedge funds, investment in individual securities, direct investment in venture capital, CMO derivatives and commodities.

The Committee’s target asset allocation seeks to control risk through portfolio diversification and takes into account, among other factors, objectives discussed above, current funding levels, cash flow conditions and economic and industry trends. In developing strategic asset allocation guidelines for the portfolio, an emphasis was placed on the long-term characteristics of individual asset classes, and the benefits of diversification among multiple asset classes. Investment decisions are based on the returns and risk relative to the Plan's liabilities, an approach commonly referred to as liability-driven investing. This approach does not preclude taking risk; instead, it reframes risk from a total-return framework to one mindful of liability-driven investing as the funded status of the domestic defined benefit pension plan improves.

The following table presents the target allocation of pension plan assets for 2018 and the actual allocation of plan assets as of December 31, 2017 and 2016 by major asset category:

	Target Allocation	Actual Allocation of Plan Assets December 31,	
Asset Category	2018	2017	2016
Domestic equities	21% - 31%	26%	30%
International equities	21% - 31%	26%	30%
Fixed income	35% - 45%	40%	28%
Hedge fund of funds	3% - 13%	7 %	10%
Cash and cash equivalents	0% - 5%	1 %	2 %

Domestic and international equities consist primarily of mutual funds valued at the closing price reported in the active market in which individual securities are traded. Equity securities include investments in domestic and international mutual funds with a blend of small, mid and large cap investments. Emerging market equities are to comprise no more than 25% of the international equities allocation. Equity securities held by the Trust are publicly traded in active markets and are classified within Level 1 of the fair value hierarchy.

Fixed income consists of long duration fixed income held in proprietary funds pooled with other investor accounts which use the net asset value (NAV) per share practical expedient to measure fair value. The total nets assets of the fund are calculated at the close of trading by the fund’s custodian. The net asset value per share is calculated by dividing the total net assets of the fund by the number of units outstanding on the valuation date. Such investments are not classified in the fair value hierarchy. Fixed income investments provide a moderate return and are aligned with the interest rate risk of the Plan's obligations.

Hedge funds are pooled funds that employ a range of investment strategies including equity and fixed income, credit driven, macro and multi oriented strategies. The hedge funds are measured at fair value using the NAV practical expedient and are not classified in the fair value hierarchy. Generally, underlying investments held by the Funds which are publicly traded are valued at their current observable market values. Other investments are valued using procedures established by the portfolio manager. Hedge funds are incorporated to diversify the portfolio and to diminish equity volatility.

Cash and cash equivalents include investments readily converted to cash valued in the active market in which the funds were traded and are classified within Level 1 of the fair value hierarchy.

The investments of the Trust are stated at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The asset’s

fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Valuation techniques used need to maximize the use of observable inputs and minimize the use of unobservable inputs. The framework for measuring fair value provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). Effective December 31, 2016, the Company adopted ASU No. 2015-07, “Fair Value Measurement (Topic 820): Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share”, which removed from the fair value hierarchy, investments for which the practical expedient is used to

measure fair value at NAV. The fixed income long duration fund and the hedge fund of funds were measured at fair value using the NAV practical expedient and are included as a reconciling item to the fair value table.

The following tables set forth the fair value of the Trust's assets by major asset category as of December 31, 2017 and December 31, 2016:

December 31, 2017

In thousands	Level 1	Level 2	Level 3	Measured at NAV	Total
Domestic equity	$11,577	$ —	$ —	—	$11,577
International equity	11,626	—	—	—	11,626
Fixed income	—	—	—	17,360	17,360
Hedge fund of funds	—	—	—	3,054	3,054
Cash and cash equivalents	557	—	—	—	557
Total Assets at Fair Value	$23,760	$ —	$ —	20,414	$44,174

December 31, 2016

In thousands	Level 1	Level 2	Level 3	Measured at NAV	Total
Domestic equity	$10,964	$ —	$ —	—	$10,964
International equity	10,944	—	—	—	10,944
Fixed income	—	—	—	10,499	10,499
Hedge fund of funds	—	—	—	3,863	3,863
Cash and cash equivalents	768	—	—	—	768
Total Assets at Fair Value	$22,676	$ —	$ —	14,362	$37,038

Estimated Future Contributions and Benefit Payments

The Company expects to contribute approximately $3.0 million to $4.0 million in cash to its domestic defined benefit pension plan in 2018, but is evaluating this strategy as a result of the recent changes to U.S. tax law enacted on December 22, 2017.

Estimated future benefit payments for the next 10 years are as follows:

In thousands	2018	2019	2020	2021	2022	2023-2027
Benefit payments	$2,499	$2,615	$2,741	$2,824	$2,854	$ 14,801

Employee Savings Plan

The Company also sponsors a 401(k) Plan. Employer contributions to this plan amounted to $2.6 million in 2017, $2.5 million in 2016, and $2.3 million in 2015. Matching contributions by the Company are made on employee pretax contributions up to five percent of compensation, with the first three percent matched at 100% and the next two percent matched at 50%.

10. Equity Compensation Plans

As of December 31, 2017, the Company's equity compensation plans consisted of the 2003 Stock Incentive Compensation Plan (the "2003 Plan") and the 2012 Stock Incentive Plan (the "2012 Plan" and together with the 2003 Plan, the "Plans") under which incentive and non-qualified stock options and time and performance based restricted shares

have been granted to employees and directors from authorized but unissued shares of common stock or treasury shares. The 2003 Plan is not active, but continues to govern all outstanding awards granted under the plan

until the awards themselves are exercised or terminate in accordance with their terms. The 2012 Plan, approved by stockholders on April 27, 2012, authorized 1,750,000 shares of common stock for awards. The 2012 Plan also authorizes an additional 1,200,000 shares of common stock to the extent awards granted under prior stock plans that were outstanding as of April 27, 2012 are forfeited. The 2012 Plan provides for the following type of awards: options, restricted stock, restricted stock units and other stock-based awards.

The Company accounts for the expense of all share-based compensation by measuring the awards at fair value on the date of grant. The Company recognizes expense on a straight-line basis over the vesting period of the entire award. Options issued by the Company under its stock option plans have a term of ten years and generally vest ratably over a period of three to four years. Time-based restricted stock grants are expensed over the vesting period of the award, which is typically two to four years. The number of performance based restricted shares that vest or forfeit depend upon achievement of certain targets during the performance period. Prior to January 1, 2016, stock-based compensation expense included estimated effects of forfeitures. Upon adoption of ASU 2016-09, Improvements to Employee Share-Based Payment Accounting, in 2016, an accounting policy election was made to account for forfeitures as they occur. Compensation expense for performance based awards is recorded based upon the service period and management's assessment of the probability of achieving the performance goals and will be adjusted based upon actual achievement. Stock options issued under the current plan must have an exercise price that may not be less than the fair market value of the Company's Common Stock on the date of grant. The Plans provide for automatic acceleration of vesting in the event of a change in control of the Company. Upon the exercise of a stock option under the Plans, shares are issued from authorized shares or treasury shares held by the Company.

The Company incurred compensation expense of $4.3 million, $4.4 million, and $2.8 million for the years ended December 31, 2017, 2016, and 2015, respectively, for all stock-based compensation plans, including restricted stock awards. No compensation costs were capitalized as part of inventory. The associated tax benefit realized was $4.0 million, $1.9 million, and $1.5 million for the years ended December 31, 2017, 2016, and 2015, respectively.

Stock Options

The fair value of each option granted was estimated on the date of grant using the Black-Scholes option-pricing model with the following weighted-average assumptions for the years ended December 31:

	2017	2016	2015
Risk-free interest rate	2.2 %	1.8 %	1.8 %
Expected life	5.5 years	5.5 years	5.5 years
Expected volatility	33 %	42 %	43 %
Expected dividend yield	— %	— %	— %

The following is a summary of the option activity as of December 31, 2017 and changes during the year then ended:

In thousands except per share amounts and years	Shares	Weighted-Average Exercise Price	Weighted- Average Remaining Contractual Term (years)	Aggregate Intrinsic Value
Outstanding at December 31, 2016	427	$ 25.32		
Granted	100	$ 51.85		
Exercised	(91)	$ 14.87		
Forfeited/Cancelled	(3)	$ 64.20		
Outstanding at December 31, 2017	433	$ 33.37	7.1	$ 8,116
Options exercisable at December 31, 2017	230	$ 22.11	5.5	$ 6,703
Unvested at December 31, 2017	203	$ 46.05	8.1	$ 1,413

The Company granted 99,840, 56,580, and 91,900 stock options during 2017, 2016, and 2015, respectively. The weighted-average grant-date fair value of options granted during the years 2017, 2016, and 2015 was $17.91, $21.11, and $15.28, respectively. There were 90,897 options exercised in 2017, 76,333 options exercised in 2016, and 166,175 options exercised in 2015. The intrinsic value for options exercised during 2017 was $3.6 million and the associated

tax benefit realized from stock options exercised was $1.1 million. The total intrinsic value for options exercised during 2016 was $2.4 million and the associated tax benefit realized from stock options exercised was $0.7 million. The total intrinsic value for options exercised during 2015 was $3.5 million and the associated tax benefit realized from stock options exercised was $1.1 million. The amount of cash received from the exercise of stock options was $1.3 million in 2017, $1.2 million in 2016, and $1.5 million in 2015. At December 31, 2017, the total unrecognized compensation cost related to non-vested stock option awards was approximately $3.4 million, with a weighted average expected amortization period of 3.1 years.

Restricted Stock

The following is a summary of the Company’s unvested restricted shares for the year ended and as of December 31, 2017:

In thousands except per share amounts

Outstanding Restricted Shares	Shares	Weighted-Average Grant-Date Fair Value
Nonvested at December 31, 2016	296	$ 34.01
Granted	76	$ 45.18
Vested	(139)	$ 22.63
Forfeited/Cancelled	(14)	$ 38.95
Nonvested December 31, 2017	219	$ 44.77

Restricted stock includes both performance-based and time-based awards. Compensation for restricted stock is recorded based on the market value of the stock on the grant date and amortized to expense over the vesting period of the award. The Company granted 52,595, 44,423, and 38,170 shares of performance-based restricted stock during 2017, 2016, and 2015, respectively. The Company granted 22,700 shares of time-based restricted stock in 2017, 31,455 shares in 2016, and 33,755 in 2015. The Company granted 485 and 8,570 of time-based restricted stock units in 2017 and 2016, respectively. The weighted average fair value per share of restricted stock granted was $45.18, $49.70, and $34.09 during 2017, 2016, and 2015, respectively. During 2017, 2016, and 2015, respectively, there were 14,045, 33,800 and 147,187 shares of restricted stock forfeited. The fair value of awards for which restrictions lapsed during the years ended December 31, 2017, 2016, and 2015 was $8.0 million, $3.4 million, and $1.4 million, respectively. At December 31, 2017, the total unrecognized compensation cost related to non-vested restricted stock awards was approximately $5.9 million, with a weighted average expected amortization period of 2.3 years.

Stock Repurchases

During the year ended December 31, 2017, the Company acquired 42,288 shares of common stock valued at $2.8 million, through withholding, pursuant to provisions in agreements with recipients of restricted stock granted under the Company's equity compensation plans, which allow the Company to withhold the number of shares having fair value equal to each recipient's tax withholding due.

11. Restructuring

In April 2017, the Company commenced a restructuring plan in the Technical Nonwovens segment which will include plant consolidations and transfer of equipment to other facilities within the segment's Europe and China operations. The consolidation of certain plants, which is expected to conclude in the second quarter of 2019, is expected to reduce operating costs, increase efficiency and enhance the Company’s flexibility by better aligning its manufacturing footprint with the segment's customer base. Accordingly, the Company expects to record pre-tax expenses of approximately $5.0 million, in connection with this restructuring plan, of which approximately $4.8 million is expected to result in cash expenditures over the period of consolidation. The Company also expects to incur cash

expenditures of approximately $3.5 million for capital expenditures associated with this plan.

During the year ended December 31, 2017, the Company recorded pre-tax restructuring expenses of $0.7 million as part of this restructuring plan. Restructuring expenses of $0.4 million were recorded in cost of sales and $0.3 million were recorded in selling, product development and administrative expenses. The Company expects to record approximately $3.5 million to $4.0 million of restructuring expenses in 2018 with the remainder to be recorded in 2019.

Actual pre-tax expenses incurred and total estimated pre-tax expenses for the restructuring program by type are as follows:

In thousands	Severance and Related Expenses	Contract Termination Expenses	Facility Exit, Move and Set-up Expenses	Total
Total estimated expenses	$ 1,200	$ 300	$ 3,500	$5,000
Expenses incurred through December 31, 2017	181	154	327	662
Estimated remaining expense at December 31, 2017	$ 1,019	$ 146	$ 3,173	$4,338

There were cash outflows of $0.2 million for the restructuring program for the year ended December 31, 2017.

Accrued restructuring costs were as follows at December 31, 2017:

In thousands	Total
Pre-tax restructuring expenses, excluding depreciation	$510
Cash paid	(177)
Balance as of December 31, 2017	$333

12. Segment Information

The Company’s reportable segments as of December 31, 2017 were Performance Materials, Technical Nonwovens, Thermal/Acoustical Metals, and Thermal/Acoustical Fibers. Other Products and Services (“OPS”) included Life Sciences Vital Fluids, which was sold on January 30, 2015.

On December 31, 2016, the Company completed an acquisition of the nonwoven needle punch materials businesses, which include MGF Gutsche & Co GmbH KG, FRG and Gutsche Environmental Technology (Yixing) Co. Ltd., China, operating under Gutsche (“Gutsche”), a German based corporation. The Gutsche operations manufacture nonwoven needle punch materials and predominantly serve the industrial filtration and high performance nonwoven markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

On July 7, 2016, the Company completed an acquisition of the nonwoven and coating materials businesses primarily operating under the Texel brand (“Texel”) from ADS, Inc. (“ADS”), a Canadian based corporation. The Texel operations manufacture nonwoven needle punch materials and predominantly serve the geosynthetic, liquid filtration, and other industrial markets. The acquired businesses are included in the Company's Technical Nonwovens reporting segment.

During the third quarter of 2017, the Company announced its plan to combine the Thermal/Acoustical Metals and Thermal/Acoustical Fibers operating segments into a single operating segment named Thermal Acoustical Solutions ("TAS"). Combining these automotive segments into one segment is expected to allow for better customer alignment, leverage operating disciplines and realize efficiencies across the global automotive operations. Through December 31, 2017 these two segments continued to be managed separately as the Company defined the future global structure and strategies of the combined businesses and effective January 1, 2018 has commenced the reporting of the two businesses as a single consolidated operating segment.

Performance Materials Segment

The Performance Materials segment includes filtration media solutions primarily for air, fluid power, and industrial applications (“Filtration”), thermal insulation solutions for building products, appliances, and energy and industrial markets (“Thermal Insulation”) and air and liquid life science applications (“Life Sciences Filtration”). Filtration products

include LydAir® MG (Micro-Glass) Air Filtration Media, LydAir® MB (Melt Blown) Air Filtration Media, LydAir® SC (Synthetic Composite) Air Filtration Media, and Arioso™ Membrane Composite Media. These products constitute the critical media component of clean-air systems for applications in clean-space, commercial, industrial and residential HVAC, power generation, and industrial processes. Lydall has leveraged its extensive technical expertise and applications knowledge into a suite of media products covering the vast liquid filtration landscape across the engine and industrial fields. The LyPore® Liquid Filtration Media series address a variety of application needs in fluid power including hydraulic filters, air-water and air-oil coalescing, industrial fluid processes and diesel fuel filtration.

Thermal Insulation products are high performance nonwoven veils, papers, mats and specialty composites for the building products, appliance, and energy and industrial markets. The Manniglas® Thermal Insulation brand is diverse in its product application ranging from high temperature seals and gaskets in ovens and ranges to specialty veils for HVAC and cavity wall insulation. The appLY® Mat Needled Glass Mats have been developed to expand Lydall's high temperature technology portfolio for broad application into the appliance market and supplements the Lytherm® Insulation Media product brand, traditionally utilized in the industrial market for kilns and furnaces used in metal processing. Lydall's Cryotherm® Super-Insulating Media, CRS-Wrap® Super-Insulating Media and Cryo-Lite™ Cryogenic Insulation products are industry standards for state-of-the-art cryogenic insulation designs used by manufacturers of cryogenic equipment for liquid gas storage, piping, and transportation.

Life Sciences is comprised of products which have been designed to meet the stringent requirements of critical applications including biopharmaceutical pre-filtration and clarification, lateral flow diagnostic and analytical testing, respiratory protection, potable water filtration and high purity process filtration such as that found in food and beverage and medical applications. Lydall also offers ultra-high molecular weight polyethylene membranes under the Solupor® trade name. These specialty microporous membranes are utilized in various markets and applications including air and liquid filtration and transdermal drug delivery. Solupor® membranes incorporate a unique combination of high mechanical strength, chemical inertness, gamma stability and very high porosity making them ideal for many applications.

Technical Nonwovens Segment

The Technical Nonwovens segment primarily produces needle punch nonwoven solutions for myriad industries and applications. Products are manufactured and sold globally under the leading brands of Lydall Industrial Filtration, Southern Felt, Gutsche, and Texel. Industrial Filtration products include nonwoven rolled-good felt media and filter bags used primarily in industrial air and liquid filtration applications. Nonwoven filter media is an effective solution to satisfy increasing emission control regulations in a wide range of industries, including power, cement, steel, asphalt, incineration, mining, food, and pharmaceutical. Advanced Materials products include nonwoven rolled-good media used in commercial applications and predominantly serves the geosynthetics, automotive, industrial, medical, and safety apparel markets. Automotive media is provided to Tier I/II suppliers and as well as the Company's Thermal/Acoustical Fibers segment.

Technical Nonwovens segment products include air and liquid filtration media sold under the brand names Fiberlox® high performance filtration felts, Checkstatic™ conductive filtration felts, Microfelt® high efficiency filtration felts, Pleatlox® pleatable filtration felts, Ultratech™ PTFE filtration felts, Powertech® and Powerlox® power generation filtration felts, Microcap® high efficiency liquid filtration felts, Duotech membrane composite filtration felts, along with our porotex® family of high temperature filtration felts including microvel® and optivel® products. Technical Nonwovens Advanced Materials products are sold under the brand names Thermofit® thermo-formable products, Ecoduo® recycled content materials, Duotex® floor protection products, and Versaflex® composite molding materials. Technical Nonwovens also offers extensive finishing and coating capabilities which provide custom engineered properties tailored to meet the most demanding applications. The business leverages a wide range of fiber types and extensive technical capabilities to provide products that meet our customers' needs across a variety of applications providing both high performance and durability.

Thermal/Acoustical Metals Segment

The Thermal/Acoustical Metals segment offers a full range of innovative engineered products tailored for the transportation sector to thermally shield sensitive components from high heat, improve exhaust gas treatment and lower harmful emissions as well as assist in the reduction of powertrain and road noise. Lydall products are found in the underbody (tunnel, fuel tank, rear muffler, spare tire) and underhood (outer dash, powertrain, catalytic converter, turbo charger, manifolds) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.

Thermal/Acoustical Metals segment products are formed on production lines capable of efficiently combining multiple layers of metal and thermal - acoustical insulation media to provide an engineered thermal and acoustical

shielding solution for an array of application areas in the global automotive and truck markets. The flux® product family in Thermal/Acoustical Metals includes several patented or IP-rich products that address applications which include: Direct Exhaust Mount heat shields, which are assembled to high temperature components like catalytic converters, turbochargers or exhaust manifolds using aluminized and stainless steel and high performance and high temperature heat insulating materials; Powertrain heat shields that absorb noise at the source and do not contribute to the engine's noise budget; and durable, thermally robust solutions for temperature sensitive plastic components such as fuel tanks that are in proximity to high temperature heat sources.

Thermal/Acoustical Fibers Segment

The Thermal/Acoustical Fibers segment offers innovative engineered products to assist primarily in noise vibration and harshness (NVH) abatement within the transportation sector. Lydall products are found in the interior (dash insulators, cabin flooring), underbody (wheel well, aerodynamic belly pan, fuel tank, exhaust) and under hood (engine compartment) of cars, trucks, SUVs, heavy duty trucks and recreational vehicles.

Thermal/Acoustical Fibers segment products offer thermal and acoustical insulating solutions comprised of organic and inorganic fiber composites for the automotive and truck markets primarily in North America. Lydall's dBCore® is a lightweight acoustical composite that emphasizes absorption principles over heavy-mass type systems. Lydall's dBLyte® is a high-performance acoustical barrier with sound absorption and blocking properties and can be used throughout a vehicle's interior to minimize intrusive noise from an engine compartment and road. Lydall's ZeroClearance® is an innovative thermal solution that utilizes an adhesive backing for attachment and is used to protect vehicle components from excessive heat. Lydall's specially engineered products provide a solution that provides weight reduction, superior noise suppression, and increased durability over conventional designs.

Thermal/Acoustical Metals segment and Thermal/Acoustical Fibers segment operating results include allocations of certain costs shared between the segments.

Other Products and Services

The Life Sciences Vital Fluids business offered specialty products for blood filtration devices, blood transfusion single-use containers and the design and manufacture of single-use solutions for cell growth, frozen storage and fluid handling, as well as equipment for bioprocessing applications.

On January 30, 2015, the Company sold all of the outstanding shares of common stock of its Life Sciences Vital Fluids business for a cash purchase price of $30.1 million. The disposition was completed pursuant to a Stock Purchase and Sale Agreement, dated January 30, 2015, by and among the Company, and the buyer. The Company recognized an after-tax gain on the sale of this business of approximately $11.8 million in the first quarter of 2015.

Net sales by segment and for OPS, as well as reconciling items, to equal consolidated net sales for the years ended December 31, 2017, 2016, and 2015 were as follows:

Consolidated Net Sales	For the Years Ended December 31,		
In thousands	2017	2016	2015
Performance Materials Segment:			
Filtration	$77,254	$70,430	$62,716
Thermal Insulation	29,496	27,783	28,311
Life Sciences Filtration	9,919	12,915	10,451
Performance Materials Segment net sales	116,669	111,128	101,478
Technical Nonwovens Segment (1),(4):			
Industrial Filtration	147,087	90,415	113,044
Advanced Materials (2)	121,990	65,090	26,089
Technical Nonwovens net sales	269,077	155,505	139,133
Thermal/Acoustical Metals Segment:			
Metal parts	168,995	156,187	141,117
Tooling	19,551	18,787	19,815
Thermal/Acoustical Metals Segment net sales	188,546	174,974	160,932
Thermal/Acoustical Fibers Segment:			
Fiber parts	153,424	144,345	135,595
Tooling	4,337	5,067	3,152
Thermal/Acoustical Fibers Segment net sales	157,761	149,412	138,747
Other Products and Services:			
Life Sciences Vital Fluids (3)	—	—	1,671
Other Products and Services net sales	—	—	1,671
Eliminations and Other (2)	(33,616)	(24,167)	(17,456)
Consolidated Net Sales	$698,437	$566,852	$524,505

Operating income by segment and for OPS and Corporate Office Expenses for the years ended December 31, 2017, 2016, and 2015 were as follows:

Operating Income	For the Years Ended December 31,		
In thousands	2017	2016	2015
Performance Materials Segment	$12,043	$12,339	$6,790
Technical Nonwovens Segment (1),(4)	26,047	15,584	13,431
Thermal/Acoustical Metals Segment	10,072	11,562	15,517
Thermal/Acoustical Fibers Segment	42,870	41,452	37,086
Other Products and Services (3)	—	—	118
Corporate Office Expenses	(25,605)	(26,145)	(20,465)
Consolidated Operating Income	$65,427	$54,792	$52,477

Operating results in 2017 were negatively impacted by $1.7 million of expenses associated with the planned combination of the T/A Metals and T/A Fibers segments, primarily in the T/A Metals segment, a $1.1 million purchase accounting adjustment related to inventory step-up in the Technical Nonwovens segment, $0.7 million and $0.3 million related to severance expenses for a reduction in force in the T/A Metals and Technical Nonwovens segments, respectively, $0.8 million of corporate strategic initiatives expenses within Corporate Office Expenses, a

$0.8 million non-cash long-lived asset impairment in the Performance Materials segments and $0.7 million of restructuring expenses in the Technical

Nonwovens segment. Operating results in 2016 were negatively impacted by $3.7 million of acquisition related expenses within Corporate Office Expenses, $3.5 million related to a settlement with the German Cartel Office in the T/A Metals segment and a $2.0 million purchase accounting adjustment related to inventory step-up in the Technical Nonwovens segment. Operating results in 2015 were negatively impacted by a $1.4 million long-lived asset impairment charge within the Performance Materials segment and unfavorable foreign currency translation of $2.0 million impacting the Performance Materials, T/A Metals and Industrial Filtration segments.

Total assets by segment and for OPS and the Corporate Office were as follows at December 31, 2017, 2016, and 2015:

Total Assets	December 31,		
In thousands	2017	2016	2015
Performance Materials Segment	$72,837	$66,965	$66,706
Technical Nonwovens Segment (1),(4)	271,713	268,104	89,566
Thermal/Acoustical Metals Segment	139,655	119,494	111,195
Thermal/Acoustical Fibers Segment	49,646	47,097	38,881
Other Products and Services (3)	—	—	—
Corporate Office	27,020	25,369	51,912
Total Assets	$560,871	$527,029	$358,260

Total capital expenditures and depreciation and amortization by segment and for OPS and the Corporate Office for the years ended December 31, 2017, 2016, and 2015 were as follows:

	Capital Expenditures			Depreciation and Amortization		
In thousands	2017	2016	2015	2017	2016	2015
Performance Materials Segment	$3,610	$4,098	$3,519	$3,999	$4,023	$4,499
Technical Nonwovens Segment (1),(4)	2,903	1,248	968	12,633	6,778	4,996
Thermal/Acoustical Metals Segment	12,316	15,425	11,494	5,489	5,094	4,233
Thermal/Acoustical Fibers Segment	5,146	6,899	4,807	3,135	2,570	2,400
Other Products and Services (3)	—	—	22	—	—	45
Corporate Office	940	489	745	874	1,094	1,102
Total	$24,915	$28,159	$21,555	$26,130	$19,559	$17,275

Net sales by geographic area for the years ended December 31, 2017, 2016 and 2015 and long-lived asset information by geographic area as of December 31, 2017, 2016, and 2015 were as follows:

	Net Sales			Long-Lived Assets		
In thousands	2017	2016	2015	2017	2016	2015
United States (3)	$376,086	$354,371	$344,950	$93,583	$88,918	$76,502
France	56,214	52,042	47,495	14,268	12,692	12,899
Germany (4)	105,828	63,301	68,861	20,872	15,649	10,149
United Kingdom	24,921	23,871	26,598	4,916	4,903	6,399
Canada (1)	84,701	40,871	—	30,739	30,911	—
China (4)	47,856	30,361	33,885	11,896	11,996	9,953
Other	2,831	2,035	2,716	1,590	1,301	815
Total	$698,437	$566,852	$524,505	$177,864	$166,370	$116,717

(1) Technical Nonwovens segment includes results of Texel for the period following the date of acquisition of July 7, 2016.

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(2) Included in the Technical Nonwovens segment and Eliminations and Other is $26.5 million, $18.2 million and $13.8 million of intercompany sales to the T/A Fibers segment for the years ended December 31, 2017, 2016 and 2015, respectively.

(3) Other Products and Services reports results for the period preceding the date of disposition of the Vital Fluids Life Sciences business on January 30, 2015.

(4) Technical Nonwovens segment includes results of Gutsche as of the acquisition date of December 31, 2016.

Foreign sales are based on the country in which the sales originated (i.e., where the Company's legal entity is domiciled). Sales to Ford Motor Company in 2017, 2016, and 2015 were $120.7 million, $110.9 million, and $95.4 million, respectively, and accounted for 17.3%, 19.6%, and 18.2% of Lydall's net sales in the years ended December 31, 2017, 2016, and 2015, respectively. These sales were reported in the Thermal/Acoustical Metal and Thermal/Acoustical Fiber segments. No other customers accounted for more than 10.0% of total net sales in 2017, 2016, and 2015.

13. Income Taxes

On December 22, 2017, the United States enacted significant changes to U.S. tax law following the passage and signing of the Tax Cuts and Jobs Act (the "Tax Reform Act"). The legislation significantly changes U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a one-time repatriation tax on undistributed foreign earnings. The Tax Reform Act permanently reduces the U.S. corporate income tax rate from a maximum of 35% to a flat 21% rate, effective January 1, 2018. Income tax effects resulting from changes in tax laws are accounted for by the Company in accordance with authoritative guidance, which requires that these tax effects be recognized in the period in which the law is enacted.

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations where a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for certain income tax effects of the Tax Reform Act. SAB 118 provides a measurement period, not to exceed one year from the enactment of the Tax Reform Act. In accordance with SAB 118, the Company is required to reflect the income tax effects of those aspects of the Tax Reform Act for which the accounting is complete. To the extent there are areas that are incomplete, but are capable of reasonable estimates, a provisional amount is required to be recorded by the Company. If a reasonable estimate is unable to be calculated, the Company is required to disclose why. The Company has recognized provisional tax impacts related to the one-time mandatory repatriation of foreign earnings and the revaluation of deferred tax assets and liabilities and included these amounts in its consolidated financial statements for the year ended December 31, 2017. The ultimate impact may differ from these provisional amounts, possibly materially, due to, among other things, additional analysis, changes in interpretations and assumptions, additional regulatory guidance from Treasury, the Internal Revenue Service and State Governments, and actions the Company may take as a result of the Tax Reform Act.

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are recognized for future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax basis. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to reverse. As a result of the reduction in the U.S. corporate income tax rate from 35% to 21% under the Tax Reform Act, the Company revalued its ending net deferred tax liabilities at December 31, 2017 and recognized a provisional $4.5 million tax benefit in the Company's consolidated statement of operations for the year ended December 31, 2017.

The Tax Reform Act also provided for a one-time deemed mandatory repatriation of post-1986 undistributed foreign subsidiary earnings and profits ("E&P") through the year ended December 31, 2017. The Company had an estimated $12.0 million of undistributed foreign E&P subject to the one-time mandatory repatriation and recognized a

provisional $0.5 million of income tax expense in the Company's consolidated statement of operations for the year ended December 31, 2017. The Company's undistributed earnings for which it had previously made an indefinite reinvestment assertion under ASC 740-30 are approximately $6.2 million. The Company has not yet made a determination to remain permanently reinvested outside of the United States in response to the Tax Reform Act. As a result, the Company has not included a provisional tax cost related to this balance at this time as a reasonable estimate has not been determined.

The Tax Reform Act also made certain changes to section 162(m) of the Internal Revenue Code which impacts the deductibility of performance based stock compensation paid to executives after January 1, 2018. As a result, the Company has recorded a provisional reserve of $0.3 million against a portion of its deferred tax assets related to stock based compensation, as future realization of the assets is not reasonably assured.

While the Tax Reform Act provides for a territorial tax system, beginning in 2018, it includes two new U.S. tax base erosion provisions, the global intangible low-taxed income ("GILTI") provisions and the base-erosion and anti-abuse tax ("BEAT") provisions. The GILTI provisions require the Company to include in its U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets. The Company has elected to account for GILTI tax in the period in which it is incurred, and therefore has not provided any deferred tax impacts of GILTI in its consolidated financial statements for the year ended December 31, 2017. The BEAT provisions in the Tax Reform Act eliminates the deduction of certain base-erosion payments made to related foreign corporations, and impose a minimum tax if greater than regular tax. The Company does not expect it will be subject to this tax and therefore has not included any tax impacts of BEAT in its consolidated financial statements for the year ended December 31, 2017. Starting January 1, 2018, the Company will account for BEAT in the period in which it is incurred to the extent this expectation changes.

The provision for income taxes consists of the following:

	For the years ended December 31,		
In thousands	2017	2016	2015
Current:			
Federal	$11,526	$15,376	$18,291
State	956	1,513	1,204
Foreign	2,425	2,104	1,684
Total Current	$14,907	$18,993	$21,179
Deferred:			
Federal	$(2,472)	$(594)	$1,583
State	256	601	1,696
Foreign	(717)	(1,179)	306
Total Deferred	(2,933)	(1,172)	3,585
Provision for income taxes	$11,974	$17,821	$24,764

The following is a reconciliation of the difference between the actual provision for income taxes and the provision computed by applying the federal statutory tax rate on earnings:

	For the years ended December 31,		
	2017	2016	2015
Statutory federal income tax rate	35.0 %	35.0 %	35.0 %
State income taxes	1.6	2.1	2.9
Valuation allowances for deferred tax assets, including state	0.1	1.3	1.3
Research and development credits	(1.0)	(1.2)	(1.5)
Capitalized transaction costs	—	0.7	—
Domestic production activities deduction	(1.8)	(2.7)	(1.6)
Stock based compensation	(4.4)	(2.1)	(0.2)
German Cartel settlement	—	2.2	—
Foreign operations and intercompany financing	(2.8)	(3.5)	(1.3)
Reserves for uncertain tax positions	(1.7)	(0.1)	(0.4)
Repatriation of foreign undistributed earnings	1.3	—	—
Revaluation of deferred tax liabilities due to federal rate change	(7.3)	—	—
Other	0.5	0.7	0.7
Effective income tax rate	19.5 %	32.4 %	34.9 %

In 2017, in addition to the Tax Reform Act, which favorably impacted the effective tax rate by a net $3.7 million, the effective tax rate of 19.5% was impacted by a favorable mix of taxable income generated from foreign operations and

intercompany financing, resulting in a tax benefit of $1.7 million, net of $0.7 million of expense to correct a foreign tax error in prior years. The Company also recorded a tax benefit of $1.1 million attributable to the Domestic Production Activities Deduction, a tax benefit of $2.7 million related to stock based compensation and a tax benefit of $1.5 million attributable to the release of certain reserves for uncertain tax positions from the settlement of the IRS tax audit that closed in the third quarter of 2017. These favorable adjustments were partially offset by tax expense of $0.3 million against certain deferred tax assets in China, as future realization of the assets is not reasonably assured.

In 2016, the effective tax rate of 32.4% was positively impacted by a favorable mix of taxable income generated from countries with lower tax rates compared to that of the United States, resulting in a tax benefit of $1.3 million. The Company also recorded a tax benefit of $1.5 million attributable to the Domestic Production Activities Deduction and a tax benefit of $1.1 million related to stock based compensation. These favorable adjustments were partially offset by tax expense of $1.2 million related to a nondeductible German Cartel settlement and a net increase in valuation allowance against certain deferred tax assets of $0.7 million, primarily related to tax valuation allowances of $0.5 million recorded against certain net deferred tax assets in the Netherlands and China, as future realization of the assets is not reasonably assured.

In 2015, the effective tax rate of 34.9% was positively impacted by a favorable mix of taxable income generated from countries with lower tax rates compared to that of the United States, resulting in a tax benefit of $1.0 million. The Company also recorded a tax benefit of $1.2 million attributable to the Domestic Production Activities Deduction and a tax benefit of $1.1 million related to research and development credits. These favorable adjustments were partially offset by tax expense of $0.9 million related to a net increase in valuation allowance against certain deferred tax assets and by a $0.6 million reduction to state deferred tax assets as a result of state tax law changes that led the Company to deem the asset unrealizable in future periods. The net increase in valuation allowance against certain deferred tax assets of $0.9 million in 2015 was primarily related to tax valuation allowances of $0.8 million recorded against certain net deferred tax assets in the Netherlands and China, as future realization of the assets is not reasonably assured.

The Company maintains valuation allowances against certain deferred tax assets where realization is not reasonably assured. The Company evaluates the likelihood of the realization of deferred tax assets and reduces the carrying amount to the extent it believes a portion will not be realized. The Company's effective tax rates in future periods could be affected by earnings being lower or higher than anticipated in countries where tax rates differ from the United States federal rate, the relative impact of permanent tax adjustments on higher or lower earnings from domestic operations, changes in net deferred tax asset valuation allowances, completion of acquisitions or divestitures, changes in tax rates or tax laws and the outcome of tax audits.

The following schedule presents net current and net long-term deferred tax assets and liabilities by tax jurisdiction as of December 31, 2017 and 2016:

	2017 Deferred Tax Assets		2016 Deferred Tax Assets	
In thousands	Current	Long-term	Current	Long-term
Federal	$—	$ —	$—	$ —
State	—	—	—	—
Foreign	—	1,146	—	248
Totals	$—	$ 1,146	$—	$ 248

	2017 Deferred Tax Liabilities		2016 Deferred Tax Liabilities	
In thousands	Current	Long-term	Current	Long-term
Federal	$—	$ 7,288	$—	$ 7,705

State	—424	—531
Foreign	—7,002	—7,613
Totals	$–$ 14,714	$–$ 15,849

Net deferred tax assets (liabilities) consist of the following as of December 31, 2017 and 2016:

	December 31,	
In thousands	2017	2016
Deferred tax assets:		
Accounts receivable	$132	$225
Inventories	164	743
Net operating loss carryforwards	5,339	3,851
Other accrued liabilities	1,053	4,592
Pension	1,482	3,545
Tax Credits	1,735	1,687
Total deferred tax assets	9,905	14,643
Deferred tax liabilities:		
Intangible assets	2,073	4,224
Property, plant and equipment	15,691	21,117
Total deferred tax liabilities	17,764	25,341
Valuation allowance	5,709	4,903
Net deferred tax liabilities	$(13,568)	$(15,601)

For the years ended December 31, 2017, 2016 and 2015, income before income taxes was derived from the following sources:

	For the years ended December 31,		
In thousands	2017	2016	2015
United States	$54,212	$53,356	$64,923
Foreign	7,107	1,583	6,100
Total income before income taxes	$61,319	$54,939	$71,023

At December 31, 2017, the Company had approximately $4.0 million of state net operating loss carryforward which expires in 2035 and 2036. The Company has not recorded a deferred tax asset for this carryforward as the Company anticipates paying a non-income based franchise tax for the foreseeable future in the applicable jurisdiction. In addition, at December 31, 2017, the Company had $2.2 million of state tax credit carry forwards that expire between 2018 and 2033. As of December 31, 2017, the Company has provided a valuation reserve against $2.2 million of its state tax credit carryforwards. The Company also has $6.0 million of foreign net operating loss carryovers in China, $5.2 million of net operating loss carryovers in Germany and $10.0 million of net operating loss carryovers in the Netherlands. The Netherlands' net operating losses expire between the years 2018 and 2025 and the China net operating losses expire between the years 2018 and 2022. The Company has recorded a full valuation allowance against all of its net operating losses in the Netherlands and China, as future realization is not reasonably assured. The Company evaluates and weighs the positive and negative evidence present at each period. The Company will continue to monitor the realization criteria based on future operating results.

The Company and its subsidiaries file a consolidated federal income tax return, as well as returns required by various state and foreign jurisdictions. In the normal course of business, the Company is subject to examination by taxing authorities, including such major jurisdictions as the United States, China, France, Germany, Hong Kong, the Netherlands, Canada and the United Kingdom. Within the next fiscal year, the Company expects to conclude certain income tax matters through the year ended December 31, 2014 and it is reasonably expected that net unrecognized benefits of $0.2 million may be recognized. The total amount of unrecognized tax benefits that would affect the effective tax rate if recognized is $2.5 million as of December 31, 2017. However, $1.5 million of the unrecognized tax benefits, if recognized, would be offset in pre-tax income by the reversal of indemnification assets due to the Company. The Company is no longer subject to U.S. federal examinations for years before 2015, state and local examinations for years before 2013, and non-U.S. income tax examinations for years before 2003.

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A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows:

In thousands	2017	2016
Unrecognized tax benefits at beginning of year	$3,219	$1,657
Decreases relating to positions taken in prior periods	—	(63)
Increases relating to positions taken in prior periods	221	—
Increases relating to current period	475	1,678
Decreases due to settlements with tax authorities	(1,372)	—
Decreases due to lapse of statute of limitations	(17)	(53)
Unrecognized tax benefits at end of year	$2,526	$3,219

The Company recognizes the interest accrued and the penalties related to unrecognized tax benefits as a component of tax expense.

14. Commitments and Contingencies

Leases

The Company has operating leases that resulted in expense of $5.8 million in 2017, $5.4 million in 2016, and $5.1 million in 2015. These contracts include building, office equipment, vehicle and machinery leases that require payment of property taxes, insurance, repairs and other operating costs.

Approximate future minimum lease payments under noncancelable leases are:

	Payments due by period		
In thousands	Operating Lease Payments	Capital Lease Payments	Total
2018	$4,829	$ 283	$5,112
2019	3,842	292	4,134
2020	2,934	36	2,970
2021	1,981	—	1,981
2022	1,877	—	1,877
Thereafter	10,341	—	10,341
Total	25,804	611	26,415
Interest on capital leases	—	(9)	(9)
Total	$25,804	$ 602	$26,406

Commitments and Contingencies

The Company is subject to legal proceedings, claims, investigations and inquiries that arise in the ordinary course of business such as, but not limited to, actions with respect to commercial, intellectual property, employment, personal injury and environmental matters. While the outcome of any matter is inherently uncertain and the Company cannot be sure that it will prevail in any of the cases, subject to the matter referenced below, the Company is not aware of any matters pending that are expected to be material with respect to the Company’s business, financial position, results of operations or cash flows.

Environmental Obligations

The Company has elected to remediate environmental contamination discovered prior to the closing of the Texel acquisition at a certain property in the province of Quebec, Canada (“the Property”) that was acquired by Lydall. The Company records accruals for environmental costs when such losses are probable and reasonably estimable. In 2016,

the Company, through the engagement of a third-party environmental service firm, determined the final scope and timing of the remediation project and estimated the cost of the remediation project to range between $0.9 million and $1.5 million. Based upon this range of estimated remediation costs, the Company recorded an environmental

liability of $0.9 million within other long-term liabilities on the Company's balance sheet at December 31, 2016. In July, 2017, the third-party environmental service firm completed its initial investigatory work and, based on information provided from the results of such work, the Company increased its environmental liability by $0.6 million to $1.5 million at June 30, 2017. During the year ended December 31, 2017, the environmental liability was reduced by $0.7 million, reflecting payments made to vendors, resulting in a balance of $0.8 million at December 31, 2017. The remaining balance for the environmental liability of $0.8 million (which remains fully offset as described below) is included within other long-term liabilities on the Company's balance sheet at December 31, 2017.

Pursuant to the Share Purchase Agreement, ADS has agreed to indemnify the Company from all costs and liabilities associated with the contamination and remediation work, including the costs of preparation and approval of the remediation plan and other reports in relation therewith. This indemnity was secured by an environmental escrow account, which was established in the amount of $3.0 million Canadian Dollars (approximately $2.4 million U.S. Dollars as of December 31, 2017). Should the costs and liabilities exceed the environmental escrow amount, the Company also has access to the general indemnity escrow account, which was originally established in the amount of $14.0 million Canadian Dollars (approximately $11.1 million U.S. Dollars as of December 31, 2017), and based on the Share Purchase Agreement was reduced to approximately $7.0 million Canadian Dollars (approximately $5.6 million U.S. Dollars as of December 31, 2017). Based on the foregoing, an indemnification asset of $0.9 million was also recorded in other assets at December 31, 2016 as the Company believed, and still believes, collection from ADS is probable. This indemnification asset was increased by $0.6 million to reflect the most current estimate of $1.5 million at June 30, 2017. The indemnification asset was decreased by $0.7 million reflecting reimbursement for indemnification from ADS for payments made by the Company to its vendors during the year ended December 31, 2017. The resulting indemnification asset balance is $0.8 million at December 31, 2017. The accrual for remediation costs will be adjusted as further information develops, estimates change and payments to vendors are made for remediation, with an off-setting adjustment to the indemnification asset from ADS if collection is deemed probable.

In the fourth quarter of 2016, as part of a groundwater discharging permitting process, water samples collected from wells and process water basins at the Company’s Rochester New Hampshire manufacturing facility, within the Performance Materials segment, showed concentrations of Perfluorinated Compounds (“PFCs”) in excess of state ambient groundwater quality standards.

In January 2017, the Company received a notification from the State of New Hampshire Department of Environmental Services (“NHDES”) naming Lydall Performance Materials, Inc. a responsible party with respect to the discharge of regulated contaminants and, as such, is required to take action to investigate and remediate the impacts in accordance with standards established by the NHDES. The Company conducted a site investigation, the scope of which was reviewed by the NHDES, in order to assess the extent of potential soil and groundwater contamination and develop a remedial action. Based on input received from NHDES in March 2017 with regard to the scope of the site investigation, the Company recorded $0.2 million of expense in the first quarter of 2017 associated with the expected costs of conducting this site investigation. Based on additional information obtained through the results of its site investigation and correspondence with NHDES in September 2017, no additional expense was recorded in the third quarter of 2017.

In the fourth quarter of 2017, the Company completed its state-approved site investigation report and submitted it to the NHDES. The Company does not know the scope or extent of its future obligations, if any, that may arise from the NHDES review of the site investigation report and therefore is unable to estimate the cost of any required future corrective actions. The Company expects a response from the NHDES to the site investigation report in the first quarter of 2018. During the year ended December 31, 2017, the environmental liability of $0.2 million has been reduced by $0.2 million reflecting payments made to vendors, resulting in no balance at December 31, 2017.

While the site investigation is complete, the Company cannot be sure that costs will not exceed the current estimates until a response is received from the NHDES nor that any future corrective action at this location would not have a

material effect on the Company's financial condition, results of operations or liquidity. Provisions for such matters are charged to expense when it is probable that a liability has been incurred and reasonable estimates of the liability can be made. Estimates of environmental liabilities are based on a variety of matters, including, but not limited to, the stage of investigation, the stage of the remedial design, evaluation of existing remediation technologies, and presently enacted laws and regulations. In future periods, a number of factors could significantly impact any estimates of environmental remediation costs.

15. Earnings Per Share

The following table provides a reconciliation of weighted-average shares used to determine basic and diluted earnings per share.

	For the years ended December 31,		
In thousands	2017	2016	2015
Basic average common shares outstanding	17,045	16,871	16,746
Effect of dilutive options and restricted stock awards	272	370	338
Diluted average common shares outstanding	17,317	17,241	17,084

For the years ended December 31, 2017, 2016 and 2015, stock options for 44,837, 94,796, and 121,057 shares of Common Stock, respectively, were not considered in computing diluted earnings per common share as the stock options were considered anti-dilutive.

16. Quarterly Financial Information (Unaudited)

The following table summarizes quarterly financial results for 2017 and 2016. In management's opinion, all material adjustments necessary for a fair statement of the information for such quarters have been reflected.

	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
In thousands except per share data	2017	2016	2017	2016	2017	2016	2017	2016
Net sales	$165,487	$129,700	$174,879	$137,235	$180,041	$155,725	$178,030	$144,192
Gross profit	$40,424	$32,377	$43,253	$35,990	$39,980	$38,193	$39,405	$31,982
Net income	$11,669	$9,169	$13,125	$10,813	$10,675	$12,785	$13,848	$4,420
Earnings per common share:								
Basic	$0.69	$0.54	$0.77	$0.64	$0.63	$0.76	$0.81	$0.26
Diluted	$0.68	$0.54	$0.76	$0.63	$0.62	$0.75	$0.80	$0.26

The table above includes the quarterly results of Texel since the acquisition date of July 7, 2016. The Gutsche acquisition was on December 31, 2016, therefore, there are no operating results included in the table above from Gutsche for 2016.

The following components are included gross profit and net income for 2017 and 2016 and impact the comparability of each year:

	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter	
In thousands except per share data	2017	2016	2017	2016	2017	2016	2017	2016
Gross profit impact:								
Inventory step-up purchase accounting adjustments	$481	$ —	$543	$ —	$83	$1,607	$ —	$347
Restructuring, severance and segment consolidation expenses	441	—	92	—	287	—	155	—
Net income impact:								
Inventory step-up purchase accounting adjustments	350	—	394	—	59	1,176	—	254
Restructuring, severance and segment consolidation expenses	702	—	216	—	910	—	488	—
Long-lived asset impairment charge	490	—	—	—	—	—	—	—
Strategic initiatives expenses	125	365	—	1,080	219	820	205	786
German Cartel settlement	—	—	—	—	—	—	—	3,479

During the quarter ended December 31, 2017, the Company recorded an out of period adjustment reducing net income by $0.8 million to correct a foreign tax error in prior periods. This error resulted in the overstatement of net income by less than $0.1 million in each of the first, second, and third quarters of 2017. This error also impacted each quarter in 2016, 2015 and 2014 by less than $0.1 million. The Company evaluated the impact of these errors and determined them to be immaterial to all quarters and years.

During the quarter ended December 31, 2016, the Company recorded out of period adjustments reducing gross profit by $0.9 million and net income by $0.6 million to correct inventory and cost of sales errors within the T/A Metals and Technical Nonwovens segments. These errors resulted in the overstatement of gross profit by $0.5 million and net income by $0.3 million in the second quarter of 2016 and overstatement of gross profit by $0.4 million and net income by $0.3 million in the third quarter of 2016. The Company evaluated the impact of these errors and determined them to be immaterial to all quarters in 2016.

17. Recently Issued Accounting Standards

In May 2014, the FASB issued ASU No. 2014-09, “Revenue from Contracts with Customers (Topic 606)." The objective of this standard update is to remove inconsistent practices with regard to revenue recognition between US GAAP and IFRS. The standard intends to improve comparability of revenue recognition practices across entities, industries, jurisdictions and capital markets. ASU 2014-09 is effective for the Company’s interim and annual reporting periods beginning January 1, 2018, and is to be adopted using either a full retrospective or modified retrospective transition method with early adoption permitted for annual periods beginning after December 15, 2016.

The new standard requires new comprehensive qualitative and quantitative disclosures relating to the nature, amount, timing and uncertainty of revenue arising from contracts with customers, including significant judgments and estimates used when applying the guidance.

Subsequent to the issuance of ASU No. 2014-09, the FASB has issued the following update; ASU No. 2016-20, “Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers”. The amendments in this update affects the guidance contained within ASU 2014-09 and were assessed as part of the Company's revenue recognition project plan.

In the first quarter of 2018, the Company will complete its conversion activities, including the integration of the standard update into financial reporting processes and systems, and the final cumulative effect adjustment to be recorded upon implementation of ASU 2014-09. The Company continues to assess the impacts to all of its segments under the new standard and has identified an impact to the timing of revenue recognition across all segments. The Company currently

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recognizes revenue at a point in time typically when products are shipped and risk of loss has transferred to the customer, whereas the implementation of the new standard will result in revenue associated with certain customer contracts moving to an over-time revenue recognition model. Under the new standard, the customized nature of some products combined with contractual provisions that provide the Company with an enforceable right to payment will require the Company to recognize revenue related to these customer contracts prior to the product being shipped to the customer. As such, revenue associated with these contracts will be recognized as costs are incurred. This change generally results in an acceleration of revenue compared with the Company's previous revenue recognition method for these contracts.

The Company will adopt ASU 2014-09 effective January 1, 2018, under the modified retrospective transition method. At the adoption date, the cumulative impact of revenue that would have been recognized over time, is expected to be approximately $17.0 million to $23.0 million. The impact is primarily driven by tooling net sales of approximately $15.0 million to $19.0 million from customer contracts within the TAS segment. The Company expects the related adoption impact to retained earnings to be approximately $1.0 million to $2.5 million, primarily due to lower margin tooling net sales and will recognize the cumulative effect of these adjustments net of tax.

Additionally, the Company will recognize the cumulative effect of adoption on its Consolidated Balance sheet primarily as an increase in unbilled accounts receivable and a reduction in inventoriable costs as of January 1, 2018. The Company is also evaluating the disclosure requirements under the new standard that are effective in the first quarter of 2018, including disclosure of contract assets as well as disaggregated presentation of revenue.

The new standard also requires expanded disclosure regarding the nature, timing, and uncertainty of revenue, cash flow and customer contract balances, including how and when the Company satisfies its performance obligations and the relationship between revenue recognized and changes in contract balances during a reporting period. The Company will continue to evaluate these disclosure requirements and incorporated the collection of relevant data into its reporting process in the first quarter of 2018.

During the first quarter of 2018, the Company will continue to analyze the adoption impact and disclose the final impact in the March 31, 2018 Form 10-Q.

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-02, "Leases (Topic 842)". This ASU requires entities that lease assets with lease terms of more than 12 months to recognize right-of-use assets and lease liabilities created by those leases on their balance sheets. The ASU will also require new qualitative and quantitative disclosures to help investors and other financial statement users better understand the amount, timing, and uncertainty of cash flows arising from leases. This ASU is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company is currently evaluating the method and impact the adoption of ASU 2016-02 will have on the Company’s consolidated financial statements and disclosures.

In January 2017, the FASB issued ASU 2017-01, "Business Combinations (Topic 805): Clarifying the Definition of a Business", which adds guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The definition of a business affects many areas of accounting including acquisitions, disposals, goodwill, and consolidation. The a mendments of this ASU provide a screen to determine when an integrated set of assets and activities is not a business. The ASU is effective for fiscal years beginning after December 15, 2017. The Company is currently evaluating the impact the adoption of ASU 2017-01 will have on the Company’s consolidated financial statements and disclosures.

In January 2017, the FASB issued ASU 2017-04, "Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment", which eliminates Step 2 from the goodwill impairment test. Instead, an entity should perform its annual or interim goodwill impairment test by comparing the fair value of a reporting unit with its carrying amount and recognize an impairment charge for the amount by which the carrying amount exceeds the reporting unit's fair value, not to exceed the total amount of goodwill allocated to the reporting unit. The ASU is effective for fiscal

years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. The Company is currently evaluating the impact the adoption of ASU 2017-04 will have on the Company’s consolidated financial statements and disclosures.

In May 2017, the FASB issued ASU No. 2017-09, "Compensation - Stock Compensation (Topic 718): Scope of Modification Accounting". This ASU requires an entity to apply modification accounting in Topic 718 when there are changes to the terms or conditions of a share-based payment award, unless the fair value, vesting conditions, and

classification of the modified award are the same as the original award immediately before the original award is modified. This ASU is effective for fiscal years beginning after December 15, 2017, with early adoption permitted. The Company is currently evaluating the method and impact the adoption of ASU 2017-09 will have on the Company’s consolidated financial statements and disclosures.

In August 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815): Targeted Improvements to Account for Hedging Activities". This ASU provides various improvements revolving around the financial reporting of hedging relationships that will require an entity to amend the presentation and disclosure of hedging activities to better portray the economic results of an entity's risk management activities in its financial statements. This ASU will also require an entity with cash flow and net investment hedges existing at the date of the adoption to apply a cumulative-effect adjustment related to eliminating the separate measurement of ineffectiveness to accumulated other comprehensive income with a corresponding adjustment to the opening balance of retained earnings as of the beginning of the fiscal year that the entity adopts this ASU. This ASU is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company is currently evaluating the method and impact the adoption of ASU 2017-12 will have on the Company’s consolidated financial statements and disclosures.

In February 2018, the FASB issued ASU No. 2018-02, "Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income". This ASU allows for reclassification of stranded tax effects resulting from the Tax Cuts and Jobs Act from accumulated other comprehensive income to retained earnings. This ASU is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company is currently evaluating the method and impact the adoption of ASU 2018-02 will have on the Company’s consolidated financial statements and disclosures.

18. Changes in Accumulated Other Comprehensive Income (Loss)

The following table discloses the changes by classification within accumulated other comprehensive income (loss) for the period ended December 31, 2017, 2016 and 2015:

In thousands	Foreign Currency Translation Adjustment	Defined Benefit Pension Adjustment	Gains and Losses on Cash Flow Hedges	Total Accumulated Other Comprehensive (Loss) Income
Balance at December 31, 2014	$ (6,586)	$ (17,575)	$ —	$ (24,161)
Other Comprehensive loss	(10,334)	(637) [a]	—	(10,971)
Amounts reclassified from accumulated other comprehensive loss	—	547 [b]	—	547
Balance at December 31, 2015	$ (16,920)	$ (17,665)	$ —	$ (34,585)
Other Comprehensive loss	(10,965)	(2,969) [a]	—	(13,934)
Amounts reclassified from accumulated other comprehensive loss		569 [b]	—	569
Balance at December 31, 2016	$ (27,885)	$ (20,065)	$ —	$ (47,950)
Other Comprehensive income	25,664	1,299 [a]	122 [c]	27,085
Amounts reclassified from accumulated other comprehensive loss	—	717 [b]	—	717
Balance at December 31, 2017	$ (2,221)	$ (18,049)	$ 122	$ (20,148)

(a) Amount represents actuarial (losses) gains arising from the Company’s postretirement benefit obligation. This amount was $1.3 million, net of $0.1 million tax expense, for 2017, $(3.0) million, net of a $1.6 million tax benefit,

for 2016 and $(0.6) million, net of $0.4 million tax benefit in 2015. (See Note 9)

(b) Amount represents the amortization of actuarial losses to pension expense arising from the Company's postretirement benefit obligation. This amount was $0.7 million, net of $0.4 million tax benefit in 2017, $0.6 million, net of $0.4 million tax benefit in 2016, and $0.5 million, net of $0.3 million tax benefit in 2015. (See Note 9)

(c) Amount represents unrealized losses on the fair value of hedging activities, net of taxes, for the year ended December 31, 2017.

Schedule II

LYDALL, INC.
VALUATION AND QUALIFYING ACCOUNTS
FOR THE YEARS ENDED December 31, 2017, 2016 AND 2015

In thousands	Balance at January 1,	Charges to Costs and Expenses	Charges (Deductions) to Other Accounts		Deductions		Balance at December 31,
2017							
Allowance for doubtful receivables	$ 1,429	$ 541	$ 103	2	$ (566)	1	$ 1,507
Tax valuation allowances	4,903	886	394	2	(474)	3	5,709
2016							
Allowance for doubtful receivables	$ 1,251	$ 941	$ (123)	2	$ (640)	1	$ 1,429
Tax valuation allowances	4,307	762	(140)	2	(26)	3	4,903
2015							
Allowance for doubtful receivables	$ 709	$ 855	$ (53)	2	$ (260)	1	$ 1,251
Tax valuation allowances	3,727	1,615	(272)	2,4	(763)	3	4,307

1. Uncollected receivables written off and recoveries.
2. Foreign currency translation and other adjustments.
3. Reduction to income tax expense.
4. Adjustments relating to the acquisition of Industrial Filtration.

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