Robert Dunn | **Michael Wolleben**

HIDDEN OPPORTUNITIES

Valuing possible breakups by providing sum-of-the-parts analysis.

- ✓ Lydall, Inc. (NYSE: LDL), a diversified manufacturer of engineered products and materials, operates three segments: (1) Performance Materials (28.5% of 2019 consolidated sales and ~29% of adj. EBITDA); (2) Technical Nonwovens (~29.5% of sales and 36% of adj. EBITDA); and (3) Thermal Acoustical Solutions (42% of sales and 35% of adj. EBITDA).

- ✓ In our view, at less than 6x 2022E EV/EBITDA and a 10%-plus FCF yield, LDL is undervalued relative to the sum value of its parts, particularly considering the growth potential of its medical filtration and engineered materials businesses, which support, among other things, N95 mask production. In recent years, LDL has successfully executed on its top-line and end-market diversification goals but has lagged on its profitability target, which has contributed, in our view, to: (1) the stock's substantial underperformance since the beginning of 2017; (2) a wholesale change in management, including the CEO and all three segment-level business heads; (3) the involvement of an activist investor, Juniper Investment Co., which currently owns a ~7% stake; and (4) the undertaking of a strategic review to evaluate its portfolio and end-markets with the goal of optimizing capital allocation and driving shareholder value. The conclusions of LDL's review are expected in 2H 2020, but we think the outcome will likely involve an even greater focus on its filtration and engineered materials businesses, which could lead to the monetization of assets or other strategic alternatives that could potentially unlock value.

- ✓ Considering management commentary as well as peer and M&A valuations, value of $18 per share, $11 per share, and $6 per share can be assigned to LDL's Performance Materials, Technical Nonwovens, and Thermal Acoustical Solutions businesses, respectively. Accounting for corporate costs and projected net debt of ~$17 per share yields a sum-of-the-parts fair value of $18 per share (with bull/bear cases of $23 and $14 per share, respectively).

- ✓ Risks include execution, competition/commoditization, labor unrest, leverage, cost inflation, currency fluctuations, further end-market disruptions, particularly in auto, and/or a prolonged recession.

Lydall, Inc.

(NYSE: LDL)

Date (7/10/20)

Price $12.49/share

Market capitalization ~$250M

Performance Materials: $18/share

Technical Nonwovens: $11/share

Thermal Acoustical Solutions: $6/share

Corporate/Net Debt: ($17/share)

SOTP: $18 per share*

***SOTP may not add due to rounding**

NOTE: This publication could be considered as advocating for corporate restructurings. Authors select companies for this report based on the potential for a future value-unlocking transaction. In many cases, these companies have or could come under activist investor pressure, media scrutiny, or general market speculation that a spin-off or asset sale is possible.

IRG Institutional Research Group

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The Background

Lydall, Inc. (NYSE: LDL) has origins dating back to 1869, when the Lydall and Foulds families began manufacturing knitting needles and paper, among other things, in Manchester, CT, where the company still has its headquarters. In 1899, the Lydall & Foulds Paper Co. was established, which was eventually acquired by The Colonial Board Co. in 1961 and went public in 1963. In 1969, the combined entity merged with Superior Steel Ball Co. to form Lydall, Inc. In subsequent years, Lydall made myriad acquisitions and divestitures and ultimately listed on the NYSE under the current ticker in 1989. Today, LDL operates three segments (see Background #1): (1) Performance Materials (28.5% of 2019 sales and 29% of adj. EBITDA); (2) Technical Nonwovens (29.5% of 2019 sales and 36% of adj. EBITDA); and (3) Thermal Acoustical Solutions (42% of 2019 sales and ~35% of adj. EBITDA), which was merged from two previous units, the Thermal/Acoustical Metal and Thermal/Acoustical Fiber segments, in August 2017.

Background #1 Lydall, Inc.: Selected Financial Items, 2016–2022E
($ in millions)

	2016	2017	2018	2019	2020E	2021E	2022E
Revenue:							
Performance Materials	$111.1	$116.7	$169.2	$245.5	$251.2	$272.1	$287.3
Technical Nonwovens	$155.5	$269.1	$277.1	$255.3	$217.6	$231.6	$238.7
Thermal Acoustical Solutions	$321.2	$342.1	$365.4	$361.6	$256.7	$270.1	$280.0
Eliminations & Other	($21.0)	($29.4)	($25.8)	($25.0)	($25.0)	($25.0)	($25.0)
Net sales	**$566.9**	**$698.4**	**$785.9**	**$837.4**	**$700.5**	**$748.8**	**$781.0**
Adj. Operating profit:							
Performance Materials	$12.6	$12.3	$15.3	$4.7	$13.4	$27.2	$31.6
Technical Nonwovens	$17.5	$28.1	$23.8	$24.1	$13.0	$16.2	$17.9
Thermal Acoustical Solutions	$56.6	$55.2	$38.1	$25.0	$11.6	$14.8	$16.7
Corporate costs	($22.1)	($26.4)	($19.7)	($22.0)	($25.0)	($25.0)	($25.0)
Total	**$64.6**	**$69.2**	**$57.5**	**$31.8**	**$12.9**	**$33.2**	**$41.2**
Adj. EBITDA:							
Performance Materials	$16.6	$16.3	$24.4	$29.8	$36.6	$42.1	$46.0
Technical Nonwovens	$24.3	$40.7	$37.6	$36.8	$25.0	$28.4	$30.3
Thermal Acoustical Solutions	$64.2	$63.8	$47.3	$35.1	$20.0	$23.4	$25.3
Corporate	($21.1)	($25.7)	($19.0)	($21.3)	($24.5)	($24.5)	($24.5)
Total	**$84.0**	**$95.2**	**$90.2**	**$80.4**	**$57.1**	**$69.4**	**$77.1**
Capital expenditures:							
Performance Materials	$4.1	$3.6	$11.3	$8.9	$22.5	$19.5	$10.1
Technical Nonwovens	$1.2	$2.9	$5.9	$9.3	$5.4	$8.1	$8.4
Thermal Acoustical Solutions	$22.3	$17.5	$11.9	$17.9	$7.7	$13.5	$14.0
Corporate	$0.5	$0.9	$0.5	$0.3	$0.5	$0.5	$0.5
Total	**$28.2**	**$24.9**	**$29.6**	**$36.4**	**$36.2**	**$41.6**	**$32.9**

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

In 2012-2013, LDL began executing on a strategic plan aimed at diversifying its business into higher-margin/higher-growth areas, including the filtration and engineered materials sectors (and away from more cyclical/commoditized automotive applications). For context, when LDL embarked on this transformation, the management team initially articulated a long-term vision of achieving 2018 consolidated sales of ~$800 million and an operating margin of ~15% (versus ~6%-7% in 2012-2013), with a business mix that would be less than 50% automotive-related (compared with ~65% in 2012-2013). As illustrated in Background #1 and Background #2, LDL has made strides in recent years, primarily via acquisitions, toward its top-line and business mix goals, but it has materially lagged on its profitability target (even before more recent COVID-19-related pressures). (At least in part as a consequence, in our view, LDL's share price is down ~80% since reaching a high north of $60 per share at the beginning of 2017, which compares with a ~40% increase in the S&P 500 and a roughly 1% increase in the Russell 2000.)

Background #2 Lydall, Inc.: Portfolio Repositioning, 2016-2019

($ in millions)

Announced	Target	Transaction	Segment	EV	Revenue	EBITDA	EV/Sales	EV/EBITDA
May-19	Geosol (geosynthetic installation unit)	Divested	Technical Nonwovens	($3.0)	~$8.0	-	-	-
Apr-19	Hollingsworth & Vose (gasket materials unit)	Acquired	Performance Materials	-	~$6.0	-	-	-
Aug-18	Interface Performance Materials	Acquired	Performance Materials	$265.0	$150.0	$29.0	1.8x	9.1x
Jul-18	Precision Filtration	Acquired	Performance Materials	$1.6	-	-	-	-
Nov-16	Gutsche GmbH & Co.	Acquired	Technical Nonwovens	$58.0	$50.0	$6.0	1.2x	9.6x
Jul-16	Texel (a division of ADS)	Acquired	Technical Nonwovens	$96.0	$72.0	$11.5	1.3x	8.3x
Jan-15	Charter Medical, Ltd.	Divested	Sold to Fenner plc	($29.9)	($19.7)	($2.4)	1.5x	12.5x
Feb-14	Andrew Filtration	Acquired	Technical Nonwovens	$83.0	$127.0	$14.0	0.7x	5.9x
Avg.							**1.3x**	**9.1x**

	End Market Breakdown					
	% of sales			*% of EBITDA*		
Sector:	**2016**	**2019**	**2022E**	**2016**	**2019**	**2022E**
Filtration & Engineered Materials	45%	58%	65%	39%	65%	75%
Thermal Acoustical Solutions	55%	42%	35%	61%	35%	25%

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

In our view, LDL's underperformance precipitated the Board's making significant changes (or, in their contention, upgrades) to the company's senior leadership, including the appointment of a new chief executive (CEO), Sara Greenstein, who joined in November 2019 from U.S. Steel (NYSE: X), where she led a turnaround of its Consumer Solutions business unit, as well as the appointment of new heads for all three business segments (see Background #3). In addition, we would note that, in September 2019, LDL attracted the interest of activist investor Juniper Investment Co., which currently controls ~7% of the shares. In late February 2020, the company began a strategic review to evaluate its portfolio and end-markets, with the objective of optimizing capital allocation and driving long-term shareholder value. While Juniper has not made any explicit corporate action demands, at least publicly, and LDL has not specifically indicated the range of strategic options it is currently evaluating, we think it can be discerned, anecdotally, that the company's long-term strategic focus is increasingly on the filtration and engineered materials businesses (i.e., the Performance Materials and Technical Nonwovens segments).

Background #3 Lydall, Inc.: Management Refresh, 2018-2020

Position	Name	Appointment Date
President & CEO	Ms. Sara Greenstein	Nov-19
President, Performance Materials	Dr. Ashish Diwanji	Jun-20
President, Technical Nonwovens	Mr. Robert Junker	Nov-19
President, Thermal Acoustical Solutions	Mr. Joseph Abbruzzi	Jul-19
EVP & General Counsel	Mr. Chad McDaniel	Oct-19
EVP & CFO	Mr. Randall Gonzales	Mar-18

Source: Company reports.

In terms of near-term financial commentary, LDL does not provide any specific earnings guidance other than some ancillary tax rate and capital spending guidelines (see Background #4), but management does offer a degree of anecdotal commentary, most notably with respect to its efforts toward expanding manufacturing capacity of filtration media to accommodate increased demand for N95 respirator and surgical face masks, as well as regarding some countervailing headwinds in its automotive-related end-markets, which we will discuss in each of the respective segment sections. In terms of long-term financial commentary, the current management team has simply articulated the vision of driving top-line growth in excess of expansion in gross domestic product (i.e., GDP-plus), with consistent margin improvement. (That said, it is possible that the company will provide more specific benchmarks to investors sometime in 2H 2020 following the completion of its strategic review.)

Background #4 Lydall, Inc.: 2020E Consolidated Guidance, Initial and Current

	2019A	Initial 2020	Current 2020E
Capital expenditures	$35.9 million	$25 - $30 million	$18 - $22 million
Tax rate	29%	25% - 27%	25% -27%
Backlog	$119.1 million	$126.7 million	-

Source: Company reports.

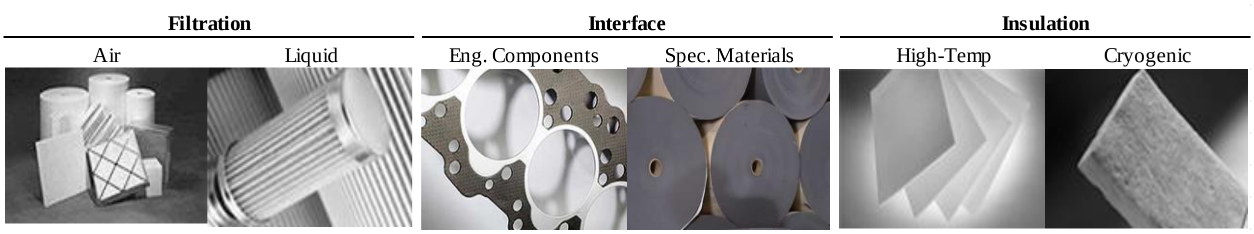
Performance Materials (PM)

The Performance Materials (PM) segment, which accounted for 28.5% of consolidated sales and 29% of adjusted EBITDA in 2019, provides filtration as well as engineered sealing & gasket solutions. The company reports sales data under two product categories: (1) Filtration (38% of segment sales in 2019), which provides "media" for air and liquid filtration/separation products that are used in a wide range of health & life science, biopharmaceutical, food & beverage, and industrial applications, including, among other things, heating, ventilation & air conditioning

(HVAC), power generation, transportation, and respiratory protection (e.g., N95 respirator and surgical masks); and (2) Sealing & Advanced Solutions (62% of segment sales), which primarily includes the gasketing and sealing offerings of Interface Performance Materials (acquired in August 2018; see Background #2), which is described in more detail below, as well as the company's thermal insulation business, which provides specialty insulation for high-temperature and/or low-temperature (i.e., cryogenic) applications. (See Background #5.)

With brands such as LydAir, Arioso, LyPore, Select-a-Seal, ManniGlas, LyTherm, CryoTherm, CRS-Wrap, and Cryo-Lite, LDL estimates it controls roughly 21% of the filtration market along with competitors Hollingsworth & Vose (private), Ahlstrom Munksjo (AM1 FH), Hokuetsu (3865 JP), and Neenah Paper (NYSE: NP), while it has ~6% of the more fragmented sealings & advanced solutions market, which includes Owens Corning (NYSE: OC), Unifrax (private), Neenah Paper, EnPro (NYSE: NPO), and Frenzelit Sealing (private). Roughly 70% of segment sales are within North America, where it has four of its six manufacturing facilities, with ~25% of sales stemming from Asia and the remainder in Europe, the Middle East and Africa (AMEA), with plants in France and Germany.

Background #5 Lydall, Inc.: Performance Materials Segment Product Portfolio, Selected Items



Source: Company reports.

In 2018, sales at the PM segment increased 45% to ~$169 million, primarily driven by a ~$50 million contribution from the Interface Performance Materials (IMP) acquisition (completed on August 31, 2018), higher organic filtration sales in North America, and, to a lesser degree, currency. Adjusted EBITDA increased almost 50% to ~$24.5 million, driven by a 40-basis-point improvement in margin to 14.4% as the improved business mix of IMP was partially offset by higher labor/overhead costs at the legacy PM business (see Background #6). (For context, LDL completed the $265 million acquisition of IMP, a designer and manufacturer of engineered sealing, gasket, and specialty materials used in the agricultural, construction, auto and industrial markets, in August 2018. The deal offered complementary expansion to new markets/customers with vertical integration capabilities and an accretive margin/growth profile. In that regard, at the time, the company expected IMP to generate annual sales of ~$150 million, with GDP-plus type growth, and adjusted EBITDA of ~$29 million, implying a better than ~19% margin [see Background #2].)

In 2019, PM segment sales increased an additional ~45% to $245.5 million, again driven primarily by ~$76 million in sealing solutions-related growth due to the IMP acquisition as well as marginally higher filtration sales (primarily owing to growth in Europe), offset by a modest ~1.5%

headwind from currency (see Background #6). Adjusted EBITDA increased ~22.5% to almost $30 million on a 230-basis-point deterioration in margin to 12.1% caused by new product costs, labor inefficiencies, and a less favorable business mix. While seemingly solid from an absolute perspective, 2019 PM segment results demonstrated decidedly weaker than expected results at the newly acquired IMP business, which, by our calculation, generated trailing-12-month sales of ~$130 million and a low double-digit margin profile (compared with initial expectations of $150 million in annual sales and a better than 19% margin). Management attributed the shortfall to broad market weakness (as opposed to market share losses), driven by geopolitical headwinds in China (i.e., trade) and India (i.e., elections) as well as distributor de-stocking in North America, a view that was broadly supported by commentary from Donaldson (NYSE: DCI) and Parker Hannifin (NYSE: PH) at the time. (Anecdotally, the company indicated its belief that IMP sales troughed at $33.6 million in 4Q 2019 and would stabilize during 2020, even assuming no significant recovery in the ag, construction, and automotive markets. As well, the company noted that it ultimately sees the business returning to a GDP-plus type long-term growth rate, which should facilitate the recapture of more historical margin levels.)

Background #6 Lydall, Inc.: Performance Materials Segment, Selected Financial Items (2016-2022E)
($ in millions)

	2016	2017	2018	2019	3 mos. 2019	3 mos. 2020	2020E	2021E	2022E
Net sales	**$111.1**	**$116.7**	**$169.2**	**$245.5**	**$64.6**	**$65.2**	**$251.2**	**$272.1**	**$287.3**
Filtration	$83.3	$87.2	$93.1	$93.3	$23.9	$25.9	$109.1	$127.9	$140.9
Sealing & Advanced Solutions	$27.8	$29.5	$76.1	$152.2	$40.6	$39.3	$142.0	$144.2	$146.4
North America	-	-	*$117.3*	*$176.1*	*$46.4*	*$45.9*	*$178.3*	*$194.5*	*$205.4*
Europe	-	-	*$49.1*	*$61.9*	*$16.7*	*$17.3*	*$65.3*	*$70.7*	*$74.7*
Asia	-	-	*$2.8*	*$7.5*	*$1.5*	*$2.0*	*$7.5*	*$6.8*	*$7.2*
Operating income	**$12.6**	**$12.3**	**$13.1**	**($59.8)**	**$1.5**	**($56.9)**	**($47.7)**	**$27.2**	**$31.6**
Impairment	-	-	-	*$64.2*	-	*$61.1*	*$61.1*	-	-
Severance	-	-	-	*$0.3*	-	-	-	-	-
Strategic initiatives	-	-	*$0.2*	-	-	-	-	-	-
Inventory step-up adjustments	-	-	*$2.0*	-	-	-	-	-	-
Adj. operating income	**$12.6**	**$12.3**	**$15.3**	**$4.7**	**$1.5**	**$4.2**	**$13.4**	**$27.2**	**$31.6**
Depreciation & amortization	$4.0	$4.0	$9.0	$25.1	$6.2	$6.3	$23.2	$15.0	$14.4
Adj. EBITDA	**$16.6**	**$16.3**	**$24.4**	**$29.8**	**$7.6**	**$10.4**	**$36.6**	**$42.1**	**$46.0**
Adj. operating margin	11.3%	10.6%	9.1%	1.9%	2.3%	6.4%	5.3%	10.0%	11.0%
Adj. EBITDA margin	14.9%	14.0%	14.4%	12.1%	11.8%	16.0%	14.6%	15.5%	16.0%
Capital expenditures	**$4.1**	**$3.6**	**$11.3**	**$8.9**	-	-	**$22.5**	**$19.5**	**$10.1**

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

In 1Q 2020, Performance Materials (PM) segment sales increased 1% to ~$65 million, as ongoing weakness in demand for auto-related sealing solutions was offset by increased filtration sales, which benefited from a spike in demand for face-mask media during the COVID-19 outbreak (see Background #6). Adjusted EBITDA rose almost 37% to ~$10.5 million on a 420-basis-point improvement in margin to 16%, which was due to a more favorable mix, primarily owing to face masks, which are in short supply, and lower raw material costs, as well as reduced travel and consulting costs (~150 basis points).

For context on the aforementioned increase in medical filtration demand, LDL's PM segment manufactures filtration materials for medical and general-use face masks and is among only a handful of companies in North America and Europe (via its facilities in Rochester, NH, and Saint-Rivalain, France) able to produce the critical filtration layer for the N95 respirator mask (as well as for ASTM 1, 2, and 3 medical masks). Additionally, the company manufactures high- and ultra-low-efficiency particulate air-grade (i.e., HEPA and ULPA) filtration media that is used in machine-powered respirators, ventilators, and hospital HVAC systems (as well as so-called "clean rooms"). (Note: on the Technical Nonwoven side of the business, LDL also makes the needle-punched felt used in medical bathing wipes, absorbent pads, medical gowns, and other personal protective equipment [PPE].) To be sure, these capabilities have been in increasingly high demand in the current environment. In that regard, in May 2020, LDL announced it had secured a major long-term agreement with Honeywell (NYSE: HON) to supply meltdown filtration media for its N95 mask production efforts. As a result, the company plans to invest in additional production capacity at its Rochester, NH facility, with the goal of beginning commercial production in 4Q 2020 that would allow it to supply filtration media for approximately one billion face masks per year (representing almost one third of the some 3.5 billion masks the U.S. Department of Health and Human Services (HHS) projects is necessary to protect frontline healthcare workers). (Note: LDL has not, as yet, publicly announced a specific dollar amount for its investment in increased meltdown capacity but has indicated that it will be incremental to its $18-$22 million 2020 capital spending budget and that the "payback period will be very short." For our part, we currently assume LDL invests ~$25 million in new capacity through 2022E.)

Subsequently, on June 30, the company announced a $13.5 million filtration media contract from the U.S. Department of Defense (DOD), which is collaborating with HHS. The contract is being funded by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and will support investment in a second new production line that is expected to increase LDL's annual domestic production capacity to ~1.7 billion N95 respirator masks and ~6.5 billion surgical face masks (or 140 million N95 respirator masks and 540 million surgical masks per month) by May 2021. (Note: Anecdotally, LDL indicates that while it would require incremental investment, its Rochester facility, from a square footage perspective, could support additional capacity expansions. That said, the company will continue to manage "the supply-demand equation very tightly" and only continue to ramp capacity in a "profitable, cash-smart way.")

Looking ahead into 2Q 2020 and the remainder of 2020, the company indicated that it is seeing "significantly" higher demand in the filtration segment, with sales up 20% year-over-year in April, while the Sealing & Advanced Solutions business is being unfavorably affected by lower auto volumes and softer demand in the agriculture and construction markets. (That said, on a quarterly basis the company believes that Sealing & Advanced Solutions sales experienced a trough in 4Q 2019 at $33.6 million.) On the broader filtration opportunity, while the company thinks there is a structural (i.e., sustainable) demand shift under way, for which current supply capabilities are greatly lacking, management has been somewhat reluctant to put a specific estimate on the potential size of the overall addressable market other than to say it is likely a "multiple" of where it was pre-COVID (but whether that be 3x, 6x, or 10x remains to be seen). Management's caution, in terms of public disclosure, is likely warranted given that the potential market opportunity is likely to attract new entrants in coming years, which is something that LDL fully expects while still viewing its leading position as durable given its technical expertise/experience (i.e., material science and engineering capabilities) as well as its long-term contracts/relationships with customers and, perhaps more importantly, equipment manufacturers (of which there are a limited number given the level of sophistication, and all of which have unsurprisingly extensive backlogs). For our part, given commentary and current trends, we think it is reasonable to project 2020E PM segment sales and adjusted EBITDA of ~$251 million and ~$37 million, respectively (see Background #6).

For 2021-2022 (see Background #6), we think it reasonable to project that solid mid-teens growth at the filtration subsegment (which could still potentially be conservative) will augment a less robust recovery at the sealing subsegment to drive compound annual top-line growth (CAGR) of ~7% to $287 million, with 2022E adjusted EBITDA of ~$46 million (implying incremental margins of ~25%).

Technical Nonwovens (TNW)

The Technical Nonwovens (TNW) segment, which accounted for 29.5% of consolidated revenue and 36% of adjusted EBITDA in 2019, is primarily the combination of Andrew Filtration (acquired in February 2014), Texel (acquired July 2016) and Gutsche (acquired November 2016) (see Background #2). The segment reports sales under two product categories: (1) Industrial Filtration (56.5% of segment sales in 2019), which provides nonwoven rolled felt media and filter bags that are primarily used in industrial air & liquid filtration, including the satisfaction of emission control regulations in the power, cement, steel, asphalt, incineration, mining, food & beverage, and pharmaceutical markets; and (2) Advanced Materials (43.5% of segment sales), which provides nonwoven products for commercial applications in the medical, geosynthetic (i.e., used for terrain stabilization in civil engineering projects), automotive, and safety apparel markets as well as offering custom/tailored finishing and coating capabilities. (See Background #7.) (Note: the inter-segment eliminations illustrated in Background #1 are primarily sales from the TNW segment to the auto-focused Thermal Acoustical Solutions [TAS] segment.)

With brands such as Fiberlox, Checkstatic, Microfelt, Pleatlox, Ultratech, Powerlox, Microcap, Thermofit, Ecoduo, Duotex, and Versaflex, LDL estimates it controls roughly 25% of the industrial filtration market along with competitors BWF Envirotec (private), and Testori (private), while it has ~9% of the more fragmented advanced materials market, which includes Propex Inc. (private), TexTech (private), TenCate (private), and Sandler AG (private). More than 60% of segment sales are in North America, where it has four of its seven manufacturing facilities; almost 30% of sales are in Asia, where it has a plant in Wuxi, China; and the remainder are in Europe, the Middle East and Africa (AMEA), where it has facilities in the U.K. and Germany .

Background #7 Lydall, Inc.: Technical Nonwovens Segment Product Portfolio, Selected Items

Filtration

Advanced Materials

Source: Company reports.

In 2018, the TNW segment's sales rose 3% to $277 million (see Background #8), primarily driven by increased industrial filtration demand (and pricing) in Europe and North America and, to a lesser degree, currency, partially offset by lower auto-related materials sales. Adjusted EBITDA decreased almost 8% to ~$38 million on a 150-basis-point deterioration in margin to 13.6%, due to higher raw material costs (e.g., polyester fiber and meta-aramid, which are also key inputs for the PM segment) and a somewhat less favorable product mix.

In 2019, TNW segment sales decreased almost 8% to ~$255 million, primarily driven by industrial filtration weakness in Asia (due to trade uncertainty), Europe, and Canada, as well as lower advanced materials sales due to the 2Q 2019 sale of Geosol (a seasonal geosynthetic installation business that generated ~$8 million of low-margin sales for which LDL will continue to supply geosynthetic material to the buyer under a long-term agreement), lower demand for materials from the auto sector, and currency, only partially offset by higher demand and pricing in North America. Adjusted EBITDA declined ~2% to ~$37 million, while margin expanded about 80 basis points to 14.4%, primarily driven by higher prices and cost savings from prior-year (2018-2019) restructurings, in which the company consolidated its manufacturing facility/labor footprints in Europe and China, with projected annual synergies of ~$5 million.

Background #8 Lydall, Inc.: Technical Nonwovens Segment, Selected Financial Items (2016-2022E)
($ in millions)

	2016	2017	2018	2019	3 mos. 2019	3 mos. 2020	2020E	2021E	2022E
Net sales	**$155.5**	**$269.1**	**$277.1**	**$255.3**	**$65.6**	**$57.4**	**$217.6**	**$231.6**	**$238.7**
Industrial Filtration	$90.4	$147.1	$157.6	$144.3	$42.4	$31.4	$93.2	$97.9	$100.3
Advanced Materials	$65.1	$122.0	$119.5	$111.0	$23.2	$26.0	$124.3	$133.7	$138.4
North America	-	-	*$167.5*	*$157.6*	*$37.2*	*$35.7*	*$134.9*	*$144.7*	*$149.2*
Europe	-	-	*$73.9*	*$68.5*	*$19.0*	*$16.9*	*$64.2*	*$67.2*	*$69.2*
Asia	-	-	*$35.6*	*$29.3*	*$9.4*	*$4.7*	*$18.5*	*$19.7*	*$20.3*
Operating profit	**$15.6**	**$26.0**	**$21.3**	**$22.9**	**$4.7**	**$3.8**	**$13.1**	**$16.2**	**$17.9**
Restructuring	-	*$0.7*	*$2.3*	*$0.8*	*$0.4*	-	-	-	-
Severance	-	*$0.3*	-	*$0.3*	-	-	-	-	-
Strategic initiatives	-	*$0.1*	-	-	-	-	-	-	-
Equity method income	-	*($0.0)*	*$0.1*	*$0.1*	*($0.0)*	*($0.0)*	*($0.0)*	-	-
Inventory step-up adjustments	$2.0	*$1.1*	-	-	-	-	-	-	-
Adj. operating income	**$17.5**	**$28.1**	**$23.8**	**$24.1**	**$5.1**	**$3.8**	**$13.0**	**$16.2**	**$17.9**
Depreciation & amortization	$6.8	$12.6	$13.9	$12.7	$3.1	$3.0	$12.0	$12.2	$12.4
Ad. EBITDA	**$24.3**	**$40.7**	**$37.6**	**$36.8**	**$8.2**	**$6.8**	**$25.0**	**$28.4**	**$30.3**
Operating margin	10.0%	9.7%	7.7%	9.0%	7.2%	6.6%	6.0%	7.0%	7.5%
Adj. operating margin	11.3%	10.5%	8.6%	9.4%	7.7%	6.6%	6.0%	7.0%	7.5%
Adj. EBITDA margin	15.6%	15.1%	13.6%	14.4%	12.5%	11.9%	11.5%	12.3%	12.7%
Capital expenditures	**$1.2**	**$2.9**	**$5.9**	**$9.3**	-	-	**$5.4**	**$8.1**	**$8.4**

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

In 1Q 2020, Technical Nonwovens segment sales decreased 12.5% to ~$57.5 million, as industrial filtration demand was lower across all regions, most notably in China, where sales were down 50% due to COVID-19-related shutdowns, more than offsetting increased demand for advanced geosynthetic and medical materials in North America. (On the medical front, during 1Q 2020, the company secured a contract from New York City's COVID-19 Emergency Services to provide PPE, including medical gowns, wipes, and absorbent bed pads.) Adjusted EBITDA decreased roughly 17% to ~$7 million on a 60-basis-point deterioration in margin to 11.9%, as fixed cost deleverage and expenses associated with a flood at one of its European facilities (150 bps) more than offset lower raw material costs and a more favorable product mix. (Notably, LDL is pursuing recoveries from insurance for its flood-related losses.) Looking into the remainder of 2020, management sees upside in the Advanced Materials subsegment, driven by increased demand for medical-related applications as well as geosynthetics (tempered by lower automotive demand), but anticipates that slower global growth will lead to softer industrial activity, which will put short-term pressure on corporate capital investment and, in turn, demand for industrial filtration applications. For our part, we think it is reasonable, given commentary and current trends, to project that full year 2020E TNW segment sales will decline ~15% to ~$218 million, with adjusted segment EBITDA of $25 million.

Looking into 2021-2022, we think it reasonable to project a top-line CAGR of almost ~5% to $239 million for 2022E, driven by growth in advanced solutions and a more modest recovery at industrial filtration, with adjusted EBITDA of ~$30 million, implying incremental margins of ~25% (see Background #8).

Thermal Acoustical Solutions (TAS)

The Thermal Acoustical Solutions (TAS) segment, which accounted for 42% of consolidated sales and 35% of adjusted EBITDA in 2019, is the product of the August 2017 merger of two previously standalone units, specifically the Thermal/Acoustical Metal and Thermal/Acoustical Fiber segments. Through this segment, the company provides engineered heat (i.e., thermal) and sound/vibration (i.e., acoustical) barriers that also aid in weight reduction and improve exhaust treatment, which can be found in the interiors (e.g., dash insulators and cabin flooring), underbody (e.g., wheel wells, belly pans, fuel tank, exhaust system, and spare tires) and under the hood (e.g., engine compartment, outer-dash, powertrain, catalytic converter, and manifolds) of many cars, trucks, and recreational vehicles (RVs) (see Background #9). Not surprisingly, the company's customer base is transportation-centric, including both light-vehicle manufacturers such as Ford (NYSE: F), which comprises ~12% of consolidated sales (down from almost 20% in 2016), General Motors (NYSE: GM), Chrysler (NYSE: FCAU), Volkswagen (VOW GR), Nissan (7201 JP), Honda (7267 JP), Mitsubishi (8058 JP), Porsche (PAHA GR), BMW (BMW GR), Renault (RNO FP), Kautex, a subsidiary of Textron (NYSE: TXT), and Bosch (BOS IN), as well as heavy-duty truck players such as Caterpillar (NYSE: CAT), John Deere (NYSE: DE), Mack (private), Mercedes-Benz (private), Volvo (VOLVA SS), Polaris (NYSE: PII), Paccar (NASDAQ: PCAR), Peterbilt (private), and Kenworth (private).

LDL estimates it controls roughly 12% of the global heat-shield market, along with competitors ElringKlinger (EGKLF US), Federal-Mogul, which was acquired by Tenneco (NYSE: TEN) in October 2018, Dana Corp. (NYSE: DAN), and Autoneum (AUTN SW), while it has ~15% of the U.S. acoustical barrier market, which includes Autoneum, Borgers AG (private), HP Pelzer Group (private), and IAC Acoustics (private). Almost 70% of segment sales are within North America, where it has two of its five manufacturing facilities, while almost 30% of sales are in EMEA and the remainder in Asia, where it has a plant in Taicang, China.

Background #9 Lydall, Inc.: Thermal Acoustical Solutions Segment Product Portfolio, Selected Items

Source: Company reports.

In 2018, Thermal Acoustical Solutions segment sales increased almost 7% to ~$365.5 million (see Background #10), as Parts sales, which comprise 90% of segment sales, benefited from increased demand in Europe and Asia (partially offset by pricing weakness in North America), and Tooling sales, which comprise the remaining ~10% of TAS sales, benefited from new platform launches (i.e., product introductions by OEMs, including Honda, GM, and Chrysler). Adjusted EBITDA declined nearly 26% to ~$47.5 million on a 580-basis-point deterioration in margin to 12.9%, driven by increased labor and overhead expenses (~320 bps), including higher expedited freight bills caused by equipment downtime, as well as increased raw materials and tariff costs (~180 basis points), primarily for aluminum, as well as polyester fiber. (Note: Lydall has pass-through arrangements based on the LME index, effectively covering ~50% of its business volumes, albeit typically with a three- to six -month lag.)

Background #10 Lydall, Inc.: Thermal Acoustical Solutions Segment, Selected Financial Items (2016-2022E)
($ in millions)

	2016	2017	2018	2019	3 mos. 2019	3 mos. 2020	2020E	2021E	2022E
Net sales	**$321.2**	**$342.1**	**$365.4**	**$361.6**	**$94.3**	**$83.8**	**$256.7**	**$270.1**	**$280.0**
Parts	$298.0	$318.2	$328.1	$326.4	$84.6	$77.3	$235.3	$247.0	$255.8
Tooling	$23.2	$23.9	$37.4	$35.1	$9.7	$6.4	$21.5	$23.1	$24.2
North America	-	-	*$250.1*	*$245.9*	*$63.6*	*$57.1*	*$174.6*	*$183.7*	*$190.4*
Europe	-	-	*$99.5*	*$98.2*	*$26.4*	*$23.5*	*$71.9*	*$75.6*	*$78.4*
Asia	-	-	*$15.8*	*$17.5*	*$4.3*	*$3.1*	*$10.3*	*$10.8*	*$11.2*
Operating profit	**$53.1**	**$53.1**	**$38.1**	**$23.6**	**$9.5**	**$5.6**	**$11.6**	**$14.8**	**$16.7**
Restructuring	-	*$1.4*	-	-	-	-	-	-	-
Severance	-	*$0.7*	-	*$1.4*	-	-	-	-	-
Legal settlement	*$3.5*	-	-	-	-	-	-	-	-
Adj. operating income	**$56.6**	**$55.2**	**$38.1**	**$25.0**	**$9.5**	**$5.6**	**$11.6**	**$14.8**	**$16.7**
Depreciation & amortization	$7.6	$8.6	$9.2	$10.2	$2.4	$2.7	$8.5	$8.5	$8.7
Adj. EBITDA	**$64.2**	**$63.8**	**$47.3**	**$35.1**	**$11.9**	**$8.3**	**$20.0**	**$23.4**	**$25.3**
Operating margin	16.5%	15.5%	10.4%	6.5%	10.1%	6.7%	4.5%	5.5%	6.0%
Adj. operating margin	17.6%	16.1%	10.4%	6.9%	10.1%	6.7%	4.5%	5.5%	6.0%
Adj. EBITDA margin	20.0%	18.7%	12.9%	9.7%	12.6%	10.0%	7.8%	8.6%	9.1%
Capital expenditures	**$22.3**	**$17.5**	**$11.9**	**$17.9**	-	-	**$7.7**	**$13.5**	**$14.0**

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

In 2019, TAS segment sales declined ~1% to $362 million, primarily due to the timing of tooling sales for new platform launches in North America and Europe, currency, and roughly $4 million of lower parts sales as a result of the GM strike (in September-October), which offset parts strength in Europe and Asia. Adjusted EBITDA declined almost 26% to $35 million on a 320-basis-point deterioration in margin to 9.7%, driven by increased labor and freight costs, primarily in North America and Europe, as well as broadly lower prices (see Background #10).

In 1Q 2020, TAS segment sales decreased ~11% to ~$84 million, as COVID-related shutdowns began in China during January (prior to the Lunar New Year) before spreading to the U.S. and Europe in mid-March. (Notably, prior to the shutdowns, parts sales in the U.S. and Europe were up ~5% through February). Adjusted EBITDA decreased 30% to roughly $8 million as lower volumes, particularly in higher-margin acoustical products, as well as pricing pressure, offset lower commodity costs and higher material productivity to drive a 260-basis-point deterioration in margin to 10.0%. Notably, as the global auto industry shutdown gained steam throughout 1Q 2020, LDL took myriad cost actions, including the furlough of more than 1,000 auto-focused workers across the portfolio, as well as enacting more permanent force reduction measures within TAS to better align its fixed cost structure. While LDL's facilities (and those of its customers) in China began to slowly resume operations in late February, management notes that TAS volumes were down ~90% in April. That said, the company expects to see measured ramp-up of production in North America in Europe during 2Q 2020 (as many OEMs, including Ford, GM, and Chrysler, began re-opening their facilities in late May), with operations stabilizing in 3Q 2020, albeit at below pre-COVID levels. (In that context, recent IHS Markit forecasts call for a ~22% decline in global light vehicle production to 69.3 million units in 2020, including a ~15.5% decline in China and 25% declines in both Europe and the U.S.) For our part, given commentary, current trends, and market forecasts, we think full year 2020E TAS segment sales could be reasonably projected to decline 29% to $257 million, with adjusted segment EBITDA of $20 million (see Background #10).

Looking into 2020-2022, while global production forecasts remain varied (and volatile), we think it reasonable to forecast a gradual recovery (i.e., mid-single-digit annual gains) in auto production driving a top-line CAGR of ~4.5% to $280 million in 2022E, with adjusted EBITDA of ~$25 million (implying incremental margins of 20%-25%) (see Background #10).

Balance Sheet and Cash Flow

At the end of 1Q 2020, LDL had net debt of ~$200 million, including cash of ~$88 million (of which ~$53 million was domiciled in the U.S.) and debt of ~$288 million, with a net leverage ratio, per its credit agreement, of 2.9x (see Background #11). LDL's $450 million credit facility is primarily comprised of a $200 million term loan and a $250 million revolver (which has more than $100 million available), which mature August 2023 (and carry average interest of ~4.5%). On May 11, LDL amended its credit agreement, which now allows for a maximum net leverage ratio of 6.5x (previously 3.5x) through 1Q 2021, after which its leverage covenant steps down to 4.5x through 1Q 2022 before reverting to the previous 3.5x threshold in 2Q 2022. (Note: Based on our forecasts, LDL remains well within its covenant restrictions through 2022.)

Background #11 Lydall, Inc.: Balance Sheet Snapshot
($ in millions, except per share amounts)

	2016	2017	2018	2019	1Q 2020
Cash	**$71.9**	**$59.9**	**$49.2**	**$51.3**	**$87.8**
Debt:					
Long-term debt (LTD)	$128.1	$76.9	$314.6	$262.7	$278.2
Current portion of LTD	$0.6	$0.3	$10.2	$9.9	$9.9
Total	**$128.8**	**$77.2**	**$324.8**	**$272.6**	**$288.2**
Long-term lease liabilities	-	-	-	$18.4	$17.7
Net debt	**$56.8**	**$17.3**	**$275.6**	**$221.3**	**$200.3**
TTM Leverage ratio	1.5x	0.8x	3.6x	3.4x	3.7x
TTM Leverage ratio, net	0.7x	0.2x	3.1x	2.8x	2.5x
Leverage ratio, per credit facility	**0.7x**	**0.2x**	**2.8x**	**3.0x**	**2.9x**
Stockholders equity	$273.5	$353.4	$369.3	$318.4	$253.6
Book value per share	**$15.86**	**$20.41**	**$21.31**	**$18.44**	**$14.64**

Source: Company reports and Bloomberg.

On a trailing 12-month-basis, LDL's 1Q 2020 free cash flow generation expanded to $63 million from ~$30 million in 1Q 2019 (on similar capital spending levels). For full year 2020, LDL currently expects capital expenditures of $18-$22 million (down from its initial forecast of $25-$30 million, as the company has re-prioritized spending to only "business-critical investments" in the current environment). That said, the aforementioned capex budget does not include investments the company expects to deploy in expanding its filtration media capacity, particularly to support the domestic manufacture of N95 respirator masks, which it has yet to specifically quantify but which we currently estimate at ~$25 million over the next three years (see Background #12). Aside from internal investments, the company's main priority for excess cash will be for debt repayment toward a leverage ratio target of ~2.5x; to that end, the company is currently forecasting debt repayment of ~$12 million in 2020. While our current forecasts do not assume any incremental M&A activity, which we think is unlikely near term, we discern that if the company were to pursue opportunistic acquisitions, they would be focused solely on its filtration and engineered materials businesses (i.e., the PM and TNW segments) as opposed to the TAS segment (for which management has stated it would only pursue organic growth).

Background #12 Lydall, Inc.: Sources and Uses of Cash Flow

($ in millions, except per share amounts)

	2016	2017	2018	2019	3 mos. 2019	3 mos. 2020	2020E	2021E	2022E
Net earnings	$37.2	$49.3	$34.9	($70.5)	$3.9	($56.4)	($76.4)	$15.2	$21.5
Depreciation & amortization	$19.6	$26.1	$33.2	$49.0	$11.9	$12.2	$44.2	$36.1	$36.0
Other	$13.0	($12.5)	($23.4)	$108.4	($1.5)	$70.9	$75.0	$2.5	$2.5
Cash from operating activities	**$69.7**	**$62.9**	**$44.7**	**$86.9**	**$14.4**	**$26.7**	**$42.8**	**$53.8**	**$60.0**
Capital expenditures	($25.5)	($27.0)	($31.3)	($35.9)	($9.2)	($9.2)	($36.2)	($41.6)	($32.9)
Free cash flow	**$44.3**	**$35.9**	**$13.4**	**$51.0**	**$5.1**	**$17.6**	**$6.6**	**$12.2**	**$27.0**
FCF per share	$2.57	$2.07	$0.78	$2.95	$0.30	$1.01	$0.38	$0.69	$1.52
Acquisitions, net	($152.2)	($0.3)	($270.0)	$0.9	-	-	-	-	-
Divestitures	-	-	-	$2.3	-	-	-	-	-
Issuance of common stock	$1.2	$1.3	$0.9	$0.4	-	$0.0	$0.0	-	-
Repurchases	($1.1)	($2.8)	($1.0)	($0.4)	($0.0)	($0.0)	($0.0)	-	-

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

Corporate Governance, Management, Ownership, and Recent Developments

LDL's Board of Directors is comprised of eight annually elected members (down from nine in 2019), of whom all, including the Chairman, Marc Giles, are deemed independent, with the lone exception being LDL's chief executive officer (CEO), Sara Greenstein (who replaced Dale Barnhart at the helm in November 2019). Independent directors comprise (and chair) all committees, including the audit, compensation, and governance committees. All directors and executive officers, including the former CEO, as a group, own ~5.5% of the outstanding shares (see Background #13). In terms of incentive compensation, executive pay at LDL is primarily tied to two key performance metrics, specifically operating income and working capital.

Background #13 Lydall, Inc.: Current Insider and Institutional Ownership of LDL

	Shares held	% ownership
Holders:		
BlackRock Inc.	2.7	15.4%
Dimensional Fund Advisors	1.4	8.1%
Juniper Investment Co.	**1.2**	**7.0%**
Vanguard Group	1.1	6.4%
Neuberger Berman Group	1.1	6.0%
Ameriprise Financial	0.7	4.2%
Royce & Associates	0.6	3.6%
T. Rowe Price Group	0.6	3.6%
Champlain Investments	0.6	3.4%
State Street Corp.	0.6	3.1%
Grace & White Inc.	0.4	2.1%
BMO Financial Corp.	0.3	1.6%
Charles Schwab Corp.	0.2	1.4%
Bank of New York Mellon	0.2	1.4%
Geode Capital Mgmt.	0.2	1.4%
Total	**12.1**	**68.6%**
Insiders:		
All executives, directors & insiders (15)	**1.0**	**5.6%**

Source: Company reports and Bloomberg.

As mentioned earlier, while LDL has made strides in recent years on its broader top-line and business mix goals, it has materially lagged on its profitability target, which we think has been the primary catalyst for an extended period of underperformance in the company's share price (even before the more recent precipitous decline due to COVID-19-related disruptions). All told, LDL's stock has fallen ~80% since reaching a high north of $60 per share at the beginning of 2017 versus a ~40% increase in the S&P and a roughly 1% increase in the Russell 2000. At least in part as a result of this, in our view, the company moved to make significant changes to its senior leadership, including the chief executive (CEO), Sara Greenstein, who joined in November 2019 from U.S.

Steel (NYSE: X), where she led a turnaround of its Consumer Solutions business unit, as well as the heads of LDL's three primary business segments. In addition, in September 2019, Juniper Investment Co., a self-described "concentrated long-only" investor specializing in "small to middle market" U.S. securities, disclosed a passive ~275K share position in Lydall. (At the time, LDL shares broadly traded in the $20-$25 per share range.)

Subsequently, in late February 2020, along with its 4Q 2019 results LDL announced (somewhat quietly, in our view) that it had started a strategic review, which it anecdotally indicated would be concluded during 2Q 2020, aimed at evaluating its portfolio and end-markets with the objective of optimizing capital allocation and driving long-term shareholder value. By the end of March 2020, Juniper had increased its passive stake to ~525K shares. Shortly after, in May 2020, Juniper announced an increased stake of ~7% (or ~1.23M shares) in a 13D filing that did not outline any specific corporate action recommendations but did indicate that the investor "may from time to time seek to engage in communications with one or more shareholders of the Issuer, one or more officers of the Issuer and/or one or more members of the board of directors." (Notably, Juniper's more recent purchases of LDL stock ranged between $7.02-$11.69 per share, resulting in an average cost basis, per Bloomberg, of $14.51 per share.) For its part, LDL management has neither publicly commented on its discussions, if any, with shareholders nor outlined (with any specificity) the range of strategic options it is currently evaluating; that said, we think its anecdotal indications suggest that the company's long-term strategic focus is increasingly concentrated on its filtration and engineered materials businesses. To that end, the company has suggested that it may be ready to provide more details/findings of its review during 2H 2020 (although we do not expect details to be forthcoming in conjunction with 2Q 2020 results, which will likely be announced later this month).

The Breakdown

Based on the commentary and the forecasts discussed throughout this report, we think it can be reasonably projected that LDL could generate 2022E sales and adjusted EBITDA of ~$781 million and ~$77 million, respectively (see Breakdown #1).

Breakdown #1 Lydall, Inc.: Adjusted 2016-2019 Results and 2020E-2022E Forecasts
($ in millions)

	2016	2017	2018	2019	2020E	2021E	2022E
Revenue:							
Performance Materials	$111.1	$116.7	$169.2	$245.5	$251.2	$272.1	$287.3
Technical Nonwovens	$155.5	$269.1	$277.1	$255.3	$217.6	$231.6	$238.7
Thermal Acoustical Solutions	$321.2	$342.1	$365.4	$361.6	$256.7	$270.1	$280.0
Eliminations & Other	($21.0)	($29.4)	($25.8)	($25.0)	($25.0)	($25.0)	($25.0)
Net sales	**$566.9**	**$698.4**	**$785.9**	**$837.4**	**$700.5**	**$748.8**	**$781.0**
Adj. Operating profit:							
Performance Materials	$12.6	$12.3	$15.3	$4.7	$13.4	$27.2	$31.6
Technical Nonwovens	$17.5	$28.1	$23.8	$24.1	$13.0	$16.2	$17.9
Thermal Acoustical Solutions	$56.6	$55.2	$38.1	$25.0	$11.6	$14.8	$16.7
Corporate costs	($22.1)	($26.4)	($19.7)	($22.0)	($25.0)	($25.0)	($25.0)
Total	**$64.6**	**$69.2**	**$57.5**	**$31.8**	**$12.9**	**$33.2**	**$41.2**
Adj. EBITDA:							
Performance Materials	$16.6	$16.3	$24.4	$29.8	$36.6	$42.1	$46.0
Technical Nonwovens	$24.3	$40.7	$37.6	$36.8	$25.0	$28.4	$30.3
Thermal Acoustical Solutions	$64.2	$63.8	$47.3	$35.1	$20.0	$23.4	$25.3
Corporate	($21.1)	($25.7)	($19.0)	($21.3)	($24.5)	($24.5)	($24.5)
Total	**$84.0**	**$95.2**	**$90.2**	**$80.4**	**$57.1**	**$69.4**	**$77.1**
Capital expenditures:							
Performance Materials	$4.1	$3.6	$11.3	$8.9	$22.5	$19.5	$10.1
Technical Nonwovens	$1.2	$2.9	$5.9	$9.3	$5.4	$8.1	$8.4
Thermal Acoustical Solutions	$22.3	$17.5	$11.9	$17.9	$7.7	$13.5	$14.0
Corporate	$0.5	$0.9	$0.5	$0.3	$0.5	$0.5	$0.5
Total	**$28.2**	**$24.9**	**$29.6**	**$36.4**	**$36.2**	**$41.6**	**$32.9**

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

Breakdown #2 Lydall, Inc.: Public Comparables
(currency in millions, except per share amounts)

	Lydall Inc	Ahlstrom-Munksjo Oyj	Hokuetsu Corp	Neenah Inc	Owens Corning	EnPro Industries Inc	ElringKlinger AG	Autoneum Holding AG	Tenneco Inc	Dana Inc	American Axle & Manufacturing Holdings Inc	BorgWarner Inc	Linamar Corp	Magna International Inc	Meritor Inc	MINEBEA MITSUMI Inc	Timken Co/The
Ticker	LDL	AM1 FH	3865 JP	NP	OC	NPO	EGKLF US	AUTN SW	TEN	DAN	AXL	BWA	LNR CN	MGA	MTOR	6479 JP	TKR
Price (as of 7/9/20 close)	**$12.49**	**12.86**	**366.00**	**44.68**	**55.11**	**43.92**	**6.05**	**95.75**	**6.60**	**11.19**	**6.47**	**34.40**	**36.83**	**44.52**	**18.22**	**1,882.00**	**43.73**
Market Capitalization	221.0	1,487.3	68,827.4	750.2	5,943.1	901.0	383.3	447.4	536.3	1,616.8	731.7	7,131.5	2,406.9	13,289.9	1,316.6	803,765.7	3,282.6
Net Debt (Cash)	222.7	965.1	86,043.0	217.3	3,147.0	142.0	606.5	768.5	4,717.0	2,452.0	3,053.3	1,189.0	1,539.3	4,054.0	942.0	110,610.0	1,753.7
EV	**443.7**	**2,452.4**	**154,870.4**	**967.5**	**9,090.1**	**1,043.0**	**989.8**	**1,215.9**	**5,253.3**	**4,068.8**	**3,785.0**	**8,320.5**	**3,946.2**	**17,343.9**	**2,258.6**	**914,375.7**	**5,036.3**
Revenue 2020E	700.5	2,741.0	268,650.0	779.7	6,341.2	984.8	1,448.9	1,886.4	13,727.8	5,389.9	4,480.7	7,404.6	5,664.2	30,393.9	2,080.6	980,823.2	3,217.4
Revenue 2021E	748.8	2,851.1	245,050.0	850.3	6,726.2	1,053.5	1,608.7	2,091.9	15,870.8	6,666.6	5,333.9	8,870.2	6,598.0	35,677.7	2,370.8	923,658.0	3,464.6
Revenue 2022E	781.0	2,932.1	242,333.3	-	6,967.0	1,200.0	1,698.4	2,196.3	16,778.0	8,342.0	5,483.5	10,704.5	6,850.0	38,536.7	3,560.0	969,169.8	3,726.8
EV/Sales 2020E	0.6x	0.9x	0.6x	1.2x	1.4x	1.1x	0.7x	0.6x	0.4x	0.8x	0.8x	1.1x	0.7x	0.6x	1.1x	0.9x	1.6x
EV/Sales 2021E	0.6x	0.9x	0.6x	1.1x	1.4x	1.0x	0.6x	0.6x	0.3x	0.6x	0.7x	0.9x	0.6x	0.5x	1.0x	1.0x	1.5x
EV/Sales 2022E	0.6x	0.8x	0.6x	-	1.3x	0.9x	0.6x	0.6x	0.3x	0.5x	0.7x	0.8x	0.6x	0.5x	0.6x	0.9x	1.4x
Average, ex. LDL		*0.9x*					0.7x										
2020E Net Income	(76.4)	76.2	9,928.0	29.6	282.0	31.9	(12.8)	(48.5)	(308.3)	18.8	(189.5)	372.4	129.0	520.6	69.1	47,741.6	213.7
2021E Net Income	15.2	120.7	7,400.0	46.9	402.8	49.6	17.5	16.7	85.0	253.3	39.2	648.7	322.5	1,378.2	134.2	41,578.5	275.4
2022E Net Income	21.5	138.3	9,150.0	-	495.0	-	37.7	45.1	225.5	349.0	71.6	781.0	362.0	1,763.9	211.0	55,443.7	323.3
2020A Net Income Margin	-	2.8%	3.7%	3.8%	4.4%	3.2%	-0.9%	-2.6%	-2.2%	0.3%	-4.2%	5.0%	2.3%	1.7%	3.3%	4.9%	6.6%
2021E Net Income Margin	2.0%	4.2%	3.0%	5.5%	6.0%	4.7%	1.1%	0.8%	0.5%	3.8%	0.7%	7.3%	4.9%	3.9%	5.7%	4.5%	7.9%
2022E Net Income Margin	2.8%	4.7%	3.8%	-	7.1%	-	2.2%	2.1%	1.3%	4.2%	1.3%	7.3%	5.3%	4.6%	5.9%	5.7%	8.7%
2020E EBITDA	57.1	326.4	30,100.0	87.2	982.2	120.0	120.4	106.9	652.6	348.1	528.3	912.5	648.0	2,160.0	165.2	107,942.2	521.5
2021E EBITDA	69.4	371.1	23,550.0	108.6	1,133.1	147.3	171.3	185.9	1,151.2	657.3	763.1	1,323.7	888.2	3,381.9	228.2	101,198.5	622.8
2022E EBITDA	77.1	388.2	24,566.7	-	1,239.3	175.0	200.0	230.2	1,389.5	919.3	773.0	1,608.3	943.0	3,881.3	422.8	120,331.4	689.4
2020E EBITDA Margin	8.2%	11.9%	11.2%	11.2%	15.5%	12.2%	8.3%	5.7%	4.8%	6.5%	11.8%	12.3%	11.4%	7.1%	7.9%	11.0%	16.2%
2021E EBITDA Margin	9.3%	13.0%	9.6%	12.8%	16.8%	14.0%	10.6%	8.9%	7.3%	9.9%	14.3%	14.9%	13.5%	9.5%	9.6%	11.0%	18.0%
2022E EBITDA Margin	9.9%	13.2%	10.1%	-	17.8%	14.6%	11.8%	10.5%	8.3%	11.0%	14.1%	15.0%	13.8%	10.1%	11.9%	12.4%	18.5%
2020E EV/EBITDA	7.7x	7.5x	5.1x	11.1x	9.3x	8.7x	8.2x	11.4x	8.0x	11.7x	7.2x	9.1x	6.1x	8.0x	13.7x	8.5x	9.7x
2021E EV/EBITDA	6.4x	6.6x	6.6x	8.9x	8.0x	7.1x	5.8x	6.5x	4.6x	6.2x	5.0x	6.3x	4.4x	5.1x	9.9x	9.0x	8.1x
2022E EV/EBITDA	5.8x	6.3x	6.3x	-	7.3x	6.0x	4.9x	5.3x	3.8x	4.4x	4.9x	5.2x	4.2x	4.5x	5.3x	7.6x	7.3x
Average, ex. LDL		***6.5x***					**5.2x**										
2020E EPS	($4.37)	$0.74	$46.08	$1.80	$2.62	$1.09	($0.28)	($12.31)	($3.42)	$0.21	($1.44)	$1.77	$1.97	$1.75	$0.77	$115.35	$2.67
2021E EPS	$0.86	$1.16	$45.90	$2.77	$3.76	$1.95	$0.25	$3.49	$0.98	$1.83	$0.47	$3.21	$5.04	$4.78	$1.74	$102.65	$3.60
2022E EPS	$1.21	$1.28	$52.80	-	$4.64	$2.55	$0.59	$10.46	$2.01	$2.50	$0.76	$3.93	$5.50	$6.23	$3.13	$134.89	$4.41
P/E 2020E	-	17.3x	7.9x	24.8x	21.1x	40.3x	-22.0x	-7.8x	-1.9x	53.0x	-4.5x	19.4x	18.7x	25.5x	23.5x	16.3x	16.4x
P/E 2021E	14.5x	11.1x	8.0x	16.1x	14.7x	22.5x	24.6x	27.5x	6.7x	6.1x	13.8x	10.7x	7.3x	9.3x	10.5x	18.3x	12.2x
P/E 2022E	10.3x	10.1x	6.9x	-	11.9x	17.2x	10.3x	9.2x	3.3x	4.5x	8.5x	8.8x	6.7x	7.1x	5.8x	14.0x	9.9x
Average, ex. LDL		*11.5x*					8.0x										
2022E FCF Yield	12.2%	13.0%	13.2%	-	11.1%	-	-	-	-	23.2%	93.6%	8.6%	-	11.0%	9.1%	6.6%	10.4%
2022E Free Cash Flow	27.0	192.2	8,134.0	-	656.8	-	43.9	62.4	-	374.7	684.4	615.1	-	1,461.8	120.0	50,944.3	342.0
2022E FCF Per Share	$1.52	$1.67	$48.44	-	$6.09	-	-	-	-	$2.59	$6.06	$2.97	-	$4.90	$1.66	$124.74	$4.56
2022E P/FCF	8.2x	7.7x	7.6x	-	9.0x	-	-	-	-	4.3x	1.1x	11.6x	-	9.1x	11.0x	15.1x	9.6x
EV/ Assets	0.6x	0.8x	0.4x	1.1x	1.0x	0.5x	0.5x	0.7x	0.4x	0.6x	0.6x	0.9x	0.5x	0.7x	0.7x	1.1x	1.0x
Leverage ratio, net	2.9x	2.5x	3.5x	-	2.5x	0.8x	3.0x	3.3x	3.4x	2.7x	3.9x	0.7x	1.6x	1.0x	2.2x	0.9x	2.5x

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

While many of its direct competitors are privately held, LDL's Performance Materials and Technical Nonwovens businesses could be compared, for valuation purposes, to a range of public rivals, including Ahlstrom Munksjo (AM1 FH), Hokuetsu (3865 JP), Neenah Paper (NYSE: NP), Owens Corning (NYSE: OC), and EnPro (NYSE: NPO), which trade at ~6.5x 2022E EV/EBITDA. Additionally, recent M&A activity in the sector has averaged almost 9x forward EV/EBITDA (see Breakdown #3).

Breakdown #3 Lydall, Inc.: PM and TNW Segments, Recent Industry M&A Activity, Selected Items
($ in millions)

Announced	Closed	Acquirer	Target	EV	Revenue	Trailing EBITDA	Forward EBITDA	EV/Sales	Trailing EV/EBITDA	Forward EV/EBITDA
Jul-19	Apr-20	Synthomer	Omnova	$742.4	$736.0	$58.7	$85.0	1.0x	12.6x	8.7x

Source: Company reports and Bloomberg, and Institutional Research Group estimates.

Performance Materials Segment

Applying a 7x multiple, which is toward the higher-end of the peer group, to Performance Materials segment's 2022E EBITDA of ~$46 million yields a segment value of ~$322 million, or ~$18 per share (see Breakdown #4).

Breakdown #4 Lydall, Inc.: Est. Value of Performance Materials Segment Based on 2022E EBITDA
($ in millions, except per share amounts; shares in millions)

		Performance Materials	
2021E Revenue		$272.1	
Revenue growth est.		5.6%	
2022E Revenue		**$287.3**	
Operating margin		11.0%	
Operating income		**$31.6**	
EBITDA margin		16.0%	
2022E EBITDA		**$46.0**	
Applied multiple	6.0x	**7.0x**	8.0x
Enterprise value	$275.8	**$321.7**	$367.7
Diluted shares	17.8	17.8	17.8
Per share basis	$15.54	**$18.13**	$20.71

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

Technical Nonwovens Segment

Applying a 6.5x multiple, which is a slight discount to the faster-growing/higher-margin PM segment and in line with the peer average, to the Technical Nonwovens segment's 2022E EBITDA of ~$30 million yields a segment value of $197 million, or roughly $11 per share (see Breakdown #5).

Breakdown #5 Lydall, Inc.: Estimated Value of Technical Nonwovens Segment Based on 2022E EBITDA
($ in millions, except per share amounts; shares in millions)

		Technical Nonwovens	
2021E Revenue		$231.6	
Revenue growth est.		3.1%	
2022E Revenue		**$238.7**	
Operating margin		7.5%	
Operating income		**$17.9**	
EBITDA margin		12.7%	
2022E EBITDA		**$30.3**	
Applied multiple	5.5x	**6.5x**	7.5x
Enterprise value	$167	**$197.0**	$227
Diluted shares	17.8	17.8	17.8
Per share basis	$9.39	**$11.10**	$12.81

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

Thermal Acoustical Solutions Segment

Again, while many of its direct competitors are privately held, Lydall's Thermal Acoustical Solutions business could be compared with publicly traded counterparts, including Autoneum (AUTN SW), ElringKlinger (EGKLF US), Dana Corp. (NYSE: DAN), and Tenneco (NYSE: TEN), which acquired Federal-Mogul in October 2018, as well as other auto-focused suppliers, such as American Axle & Manufacturing (NYSE: AXL), BorgWarner Inc. (NYSE: BWA), Linamar Corp. (LNR CN), Magna International Inc. (NYSE: MGA), Meritor Inc. (NYSE: MTOR), MinebeaMitsumi (6479 JP), and The Timken Co. (NYSE: TKR), which trade, on average, at ~5.0x 2022E EV/EBITDA (see Breakdown #2). In terms of recent M&A activity, Autokiniton Global (private) recently purchased Tower International (formerly NYSE: TOWR) for 5.8x forward EV/EBITDA, while Tenneco's 2018 purchase of Federal-Mogul was at an estimated 6.7x forward EV/EBITDA (see Breakdown #6).

Breakdown #6 Lydall, Inc.: TAS Segment, Recent Industry M&A Activity, Selected Items
($ in millions)

Announced	Closed	Acquirer	Target	EV	Revenue	Trailing EBITDA	Forward EBITDA	EV/Sales	Trailing EV/EBITDA	Forward EV/EBITDA
Jul-19	Sep-19	Autokiniton	Tower Int'l	$962.5	$1,589.0	$164.5	$165.0	0.6x	5.9x	5.8x
Apr-18	Oct-18	Federal-Mogul	Tenneco	$5,550	$7,950	$780	$830	0.7x	7.1x	6.7x
Jul-14	Aug-14	Autocam	NN, Inc.	$317.7	$250.0	$35.0	-	1.3x	9.1x	-
Avg.								**0.9x**	**7.3x**	**6.3x**

Source: Company reports and Bloomberg, and Institutional Research Group estimates

Applying a discounted multiple of 4.5x, which is at the low end of the peer group, to 2022E Thermal Acoustical Solutions segment 2022E EBITDA of ~$25 million yields a segment value of ~$114 million, or roughly $6 per share (see Breakdown #7).

Breakdown #7 Lydall, Inc.: Est. Value of Thermal Acoustical Solutions Segment Based on 2022E EBITDA
($ in millions, except per share amounts; shares in millions)

		Thermal Acoustical Solutions	
2021E Revenue		$270.1	
Revenue growth est.		3.7%	
2022E Revenue		**$280.0**	
Operating margin		6.0%	
Operating income		**$16.7**	
EBITDA margin		9.1%	
2022E EBITDA		**$25.3**	
Applied multiple	3.5x	**4.5x**	5.5x
Enterprise value	$89	**$114.0**	$139
Diluted shares	17.8	17.8	17.8
Per share basis	$5.00	**$6.42**	$7.85

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

Accounting for corporate costs capitalized at the weighted average segment multiple, as well as projected net debt of ~$154.5 million, yields a sum-of-the-parts valuation of ~$326 million, or ~$18 per share (Breakdown #8).

Breakdown #8 Lydall, Inc.: Sum-of-the-Parts Fair Value Estimate

($ in millions, except per share amounts; shares in millions)

	Performance Materials	Technical Nonwovens	Thermal Acoustical Solutions	Corporate	Enterprise Value	Net Debt	Market Cap
2021E Revenue	$272.1	$231.6	$270.1				
2022E Revenue	**$287.3**	**$238.7**	**$280.0**				
Operating margin	11.0%	7.5%	6.0%				
Operating income	**$31.6**	**$17.9**	**$16.7**				
EBITDA margin	16.0%	12.7%	9.1%				
2022E EBITDA	**$46.0**	**$30.3**	**$25.3**	**($24.5)**		**($154.5)**	
Applied multiple	**7.0x**	**6.5x**	**4.5x**	**6.2x**		**1.0x**	
Enterprise value	**$321.7**	**$197.0**	**$114.0**	**($152.6)**	**$480.2**	**($154.5)**	**$325.7**
Diluted shares	17.8	17.8	17.8	17.8		17.8	17.8
Per share basis	**$18.13**	**$11.10**	**$6.42**	**($8.60)**		**($8.71)**	**$18.35**
Bull (~7x)	$20.71	$12.81	$7.85	($9.98)		($8.71)	$22.69
Base (~6x)	$18.13	$11.10	$6.42	($8.60)		($8.71)	$18.35
Bear (~5x)	$15.54	$9.39	$5.00	($7.22)		($8.71)	$14.01

Source: Company reports, Bloomberg, and Institutional Research Group estimates.

The Wrap-Up

In our view, at less than 6x 2022E EV/EBITDA and a 10%-plus FCF yield, LDL is undervalued relative to the sum value of its parts, particularly considering the growth potential of its medical filtration and engineered materials businesses, which support, among other things, N95 mask production. In recent years, LDL has successfully executed on its top-line and end-market diversification goals but has lagged on its profitability targets, which has contributed, in our view, to: (1) the stock's substantial underperformance since the beginning of 2017; (2) a wholesale change in management, including the CEO and all three segment-level business heads; (3) the involvement of an activist investor, Juniper Investment Co., which currently owns a ~7% stake; and (4) the undertaking of a strategic review to evaluate its portfolio and end-markets toward the goal of optimizing capital allocation and driving shareholder value. The details/conclusions of LDL's review are expected in 2H 2020, but we think the outcome will ultimately involve an even greater focus on its filtration and engineered materials businesses, which could lead to the monetization of assets or other strategic alternatives that unlock value.

Considering management commentary as well as peer and M&A valuations, value of $18 per share, $11 per share, and $6 per share can be assigned to LDL's Performance Materials, Technical Nonwovens, and Thermal Acoustical Solutions businesses, respectively. Accounting for corporate costs and projected net debt of ~$17 per share yields a sum-of-the-parts fair value of $18 per share (with bull/bear cases of $23 and $14 per share, respectively).

Risks include execution, competition/commoditization, labor unrest (with some domestic labor contracts expiring in September of the years 2020-2022), leverage, cost inflation, currency fluctuations, further end-market disruptions, particularly in the automotive sector, and/or a prolonged global recession.