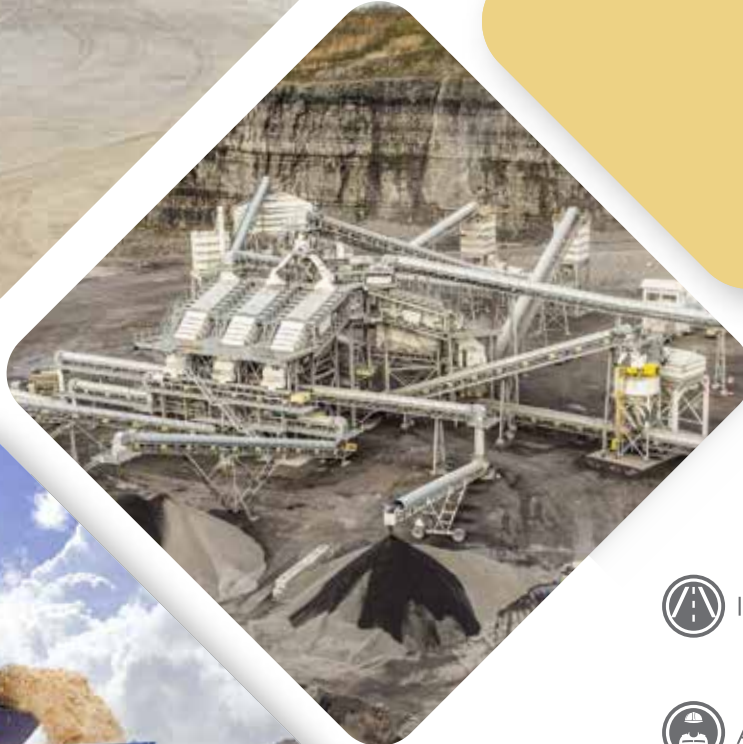




2018 ANNUAL REPORT



INFRASTRUCTURE



AGGREGATE AND MINING



ENERGY

FINANCIAL OVERVIEW

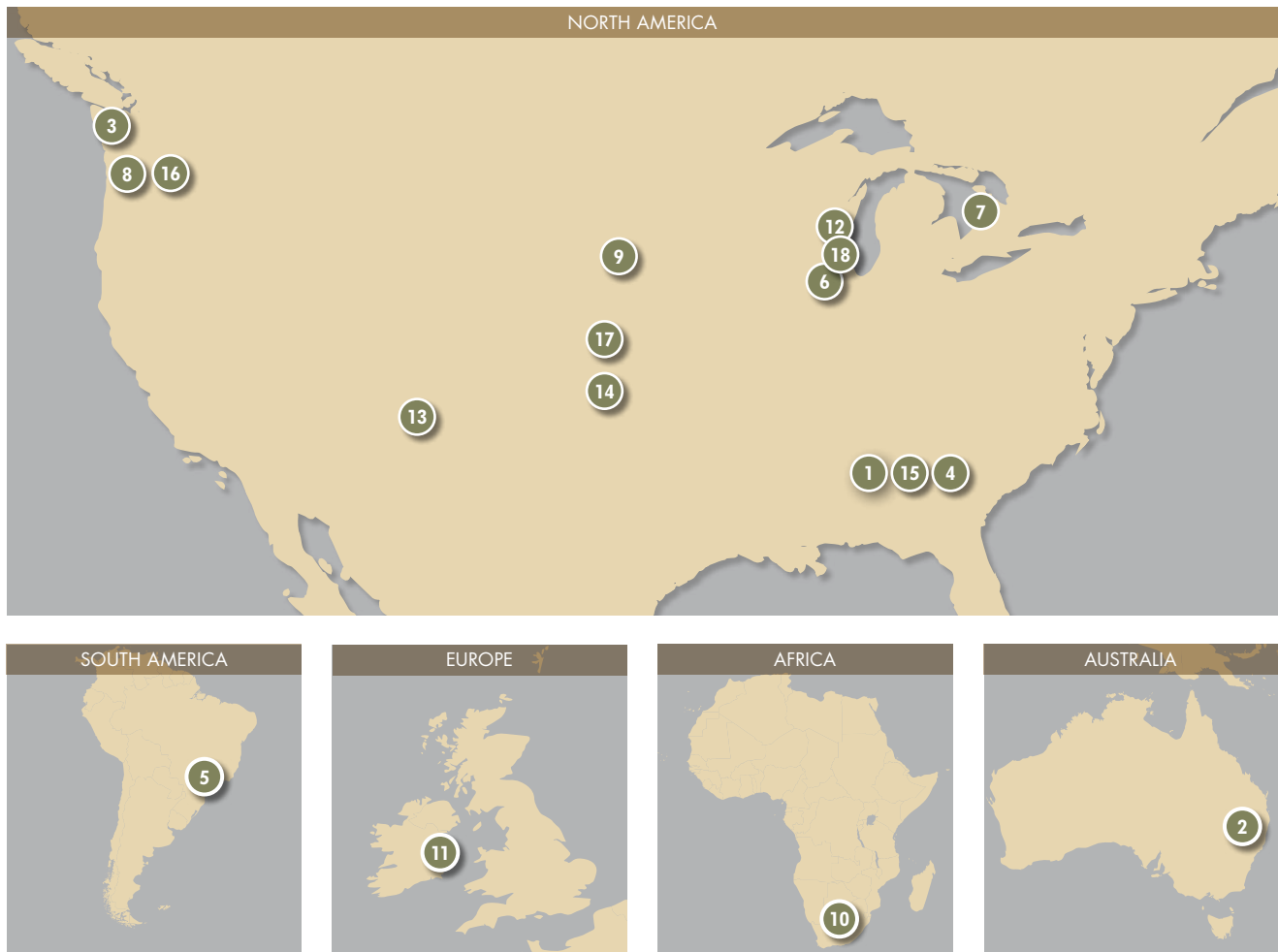
(in thousands, except as noted*)	2018	2017	2016	2015	2014
OPERATING RESULTS					
Net sales	\$1,171,599	\$1,184,739	\$1,147,431	\$983,157	\$975,595
Net income (loss) attributable to controlling interest	(60,449)	37,795	\$55,159	\$32,797	\$34,458
FINANCIAL POSITION					
Total assets	\$855,457	\$889,579	\$843,601	\$777,353	\$802,265
Working capital	371,760	423,823	407,972	399,785	388,862
Equity	585,290	686,765	648,841	609,858	596,152
PER COMMON SHARE*					
Net income (loss) attributable to controlling interest					
Basic	\$(2.64)	\$1.64	\$2.40	\$ 1.43	\$1.51
Diluted	(2.64)	1.63	2.38	1.42	1.49
Book value per common share at year end	25.53	29.58	27.99	26.30	25.62
OTHER DATA					
Weighted average number of common shares outstanding					
Basic	22,902	23,025	22,992	22,934	22,819
Diluted	22,902	23,184	23,142	23,120	23,105
Associates*	4,401	4,437	4,218	3,740	3,952

CONTENTS

Our Industry-Leading Footprint	1	Letter to Shareholders	2	New Technologies	4
INFRASTRUCTURE GROUP		AGGREGATE & MINING GROUP		ENERGY GROUP	
Astec	8	Astec do Brasil	16	CEI Enterprises	32
Astec Australia	10	Astec Mobile Screens	18	GEFCO	34
Carlson Paving Products	12	Breaker Technology	20	Heatec	36
Roadtec	14	Johnson Crushers International	22	Peterson Pacific Corp.	38
		Kolberg-Pioneer	24	Power Flame	40
		Osborn Engineered Products	26	RexCon	42
		Telestack	28		
		Telsmith	30	CORPORATE INFORMATION	
				Corporate Executive Officers	44

OUR INDUSTRY-LEADING FOOTPRINT

The companies of Astec Industries, Inc. manufacture more than 240 products for a global customer base operating in the sectors of infrastructure, aggregates, mining, and energy.



INFRASTRUCTURE GROUP

- 1 Astec
- 2 Astec Australia
- 3 Carlson Paving Products
- 4 Roadtec

AGGREGATE & MINING GROUP

- 5 Astec do Brasil
- 6 Astec Mobile Screens
- 7 Breaker Technology
- 8 Johnson Crushers International
- 9 Kolberg-Pioneer
- 10 Osborn Engineered Products
- 11 Telestack
- 12 Telsmith

ENERGY GROUP

- 13 CEI Enterprises
- 14 GEFCO
- 15 Heatec
- 16 Peterson Pacific Corp.
- 17 Power Flame
- 18 RexCon



Richard J. Dorris
Interim CEO & President, COO

FELLOW SHAREHOLDERS:

2018 was a year of mixed results. Our end markets and core products performed well, yet our overall financial performance was substandard due to several non-recurring items. The tough decisions made in 2018 will help clear the path for much improved performance in 2019 and beyond. Although it was the best long-term decision for our shareholders and customers, our decision to exit the pellet plant business had a major short-term negative impact. This action, as well as the decision to close Astec Mobile Machinery in Germany, evidences our commitment to improve the company's performance in the future. Non-cash goodwill impairment charges at RexCon and Power Flame also detracted from the bottom line in 2018.

We are confident 2019 will be a much better year as we move forward with our strategic plans to improve our operational performance. In July of 2019, we will complete the strategic procurement effort we began in August of 2018 to reduce the number of suppliers, reduce material cost, establish new procurement procedures, and improve our margins through a centrally led procurement effort that leverages the strength of our overall spending and establishes strategic partnerships with fewer suppliers. This effort is already providing results in reduced material cost, improved corporate-wide data and improved procurement procedures. We will also complete the Sales & Operational Planning training in July that is expected to improve our production planning process and reduce our inventory levels through a more consistent and more robust forecasting and planning process.

In addition to the training and guidance we received from external consultants on the strategic procurement and sales and operational planning initiatives, we have also begun our own internal training programs on quality and operational improvements. These programs are establishing a new set of key performance indicators that will be used to monitor the performance at each subsidiary on quality, customer responsiveness, productivity, inventory management and other operational areas.

The plan to increase our international sales that began in 2018 is expected to begin to show results in 2019. Our new regional sales office for Latin America is open for business in Santiago, Chile. We have an experienced team of sales and service professionals to support our existing customers and dealers as well as establish relationships with new customers in the region that extends from the US – Mexico border to the southern tip of South America. Additional regional offices will be established in 2019 to further expand our ability to reach and serve international customers. This effort will also better utilize our international manufacturing capabilities and encourage our subsidiaries to develop products that are more suited to different regions around the world. This effort has already resulted in the development of a new batch type asphalt plant design for international customers. It can be transported across the ocean in shipping containers to reduce transportation cost and can be built at lower cost manufacturing facilities around the world.

As a result of various retirements during 2018, we have had changes to our corporate management group that include new group presidents in all three of our segments. Jeff Schwarz, formerly President of JCI, is the new Group President of the Aggregate and Mining Group, Jaco van der Merwe, former Group President of the Energy Group, is now the Group President of the Infrastructure Group and Scott Barker, former President of Gefco, is now Group President of the Energy Group. All of these individuals are proven performers and we are confident they will all do a great job leading their respective groups.

Our customers tell us that they expect a good year in 2019; however, the current U.S. federal highway bill will expire in 2020. We are encouraged that Congress and President Trump seem to agree on the need to increase infrastructure spending. In order to help promote a new highway bill, we have reestablished our letter writing campaign called Don't Let America Dead End that allows our employees, customers, vendors and anyone else interested in a new highway bill to send letters to their federal representatives and the President to encourage them to pass new highway legislation. A new highway bill and increased infrastructure spending is important for the United States and for Astec Industries.

We are excited about the outlook for Astec Industries and we believe we have solid plans in place to return to profitability in 2019, improve our operational performance and grow the company.

In closing, we want to thank Ben Brock for his years of service to the company, most recently as President and Chief Executive Officer. During his tenure we made three great additions to our family of companies. We wish Ben the very best in his future endeavors. We would also like to thank all our associates at Astec Industries for their hard work and dedication throughout the year.

Thank you for your support during a difficult year and for your continued support in the future.



Richard J. Dorris
Interim CEO & President, COO



W.D. Gehl
Chairman of the Board

NEW TECHNOLOGIES

Astec Industries, Inc. is committed to bringing innovative products and solutions to market through nurturing the inventive spirit of our employees and listening to the needs and wants of our customers.

CARLSON PAVING PRODUCTS

EZR208 Rear-Mount Screed



Unveiled at the 2018 World of Asphalt Show, the EZR208 marks Carlson's entry into the 8-foot, highway-class, rear-mount market and features a standard paving width of 8' to 15'6". Through its class-exclusive extension support system and class-leading screed plate depth, the EZR208 achieves superior ride uniformity, award winning mat quality, and enhanced component lifecycle. Similar to the larger 10-foot EZR2 platform, Carlson's 8-foot rear-mount screed is available for nearly all current 8-foot North American tractors built by the major paver manufacturers, as well as retrofit on to older tractor models.

JOHNSON CRUSHERS INTERNATIONAL

K350+ Cone Crusher



Johnson Crushers International has expanded its Kodiak® Plus cone crusher series with the new K350+. This mid-range model offers higher production with a smaller footprint.

In comparison to the K300+, the K350+ increases drive train, stroke, horsepower, weight, head diameter and hold-down force, resulting in an increased capacity of up to 10%.

With the same bolt pattern, the new cone can be mounted in most current K300+ applications.

Like other cones in the Kodiak® Plus cone crusher series, the K350+ will feature an industry-leading tramp iron relief system, fully-protected internal counterweights, precision roller bearing design, patented liner retention system and 360° thread locking ring for consistent product quality.

TELESTACK

Shiploading System



This four unit system is comprised of two x TB60 All Wheel Travel Shiploaders fed by two x Titan dual-feed, all wheel travel, 800-6 Bulk Reception Feeders loading limestone, gypsum and cement.

ASTEC MOBILE SCREENS

High Frequency Screen



Astec Mobile Screens built its first, 6' x 24' high frequency screen. These larger screens offer ideal gradation control for reclaiming fines in both wet and dry applications. All high frequency screen decks are driven by variable-speed hydraulic vibrators for optimal screen efficiency.

KOLBERG-PIONEER

SuperStacker Telescoping Radial Stacker



Kolberg-Pioneer now offers an expanded line of SuperStacker® telescoping stackers with the launch of the 190 foot model with 42-inch belt. The complete line offers safe and efficient stockpiling due to tail end counterweights and a wider operating footprint. The updated, patent-pending Wizard Touch® automation software provides application flexibility with configurable stockpiles. KPI offers SuperStacker® telescoping stackers from 130 to 190 feet in length and 30- to 42-inch belt widths, depending on model.

NEW TECHNOLOGIES

Within our culture of innovation, ideas are shared among employees and with customers. Providing these opportunities to share and grow ideas, creates an environment where innovation thrives.

HEATEC

Dish Bottom Asphalt Tanks



Heatec has developed a new line of asphalt storage tanks to reduce or even eliminate the material build up that commonly accumulates in the bottom of tanks. This build up causes owners to spend thousands of dollars and significant man hours cleaning tanks. The new dish bottom tanks drain from the bottom of the tank instead of the side like other models and competitor tanks do. This design also produces better agitation and heating of the liquid asphalt. Heatec's new asphalt storage tanks will save the owner significant time and money in maintenance.

REXCON

600 BBL



RexCon's new 600 BBL – 112 Ton, self-erecting auxiliary cement bin offers crane-less setup in a single load of freight. Unveiled in 2018, the integral sub-frame design enables concrete producers to install the cement bin without the need for installing or removing concrete foundations typically required (assuming proper soil conditions). The unit features a single 40 HP direct-drive screw and pre-plumbed aeration blower for quick delivery of cementitious materials to the batch plant. When coupled with RexCon's flagship Mobile 12 SE concrete plant or the Model S concrete paving plant, the unit offers a combination of installation flexibility and large capacity unique to the industry.

ASTEC, INC.

Silobot™ Inspection Device



In 2018, the Astec Silobot inspection service for testing silo wall thickness made its in-field debut. Astec Silobot inspection service uses an innovative, remotely controlled robot that analyzes, evaluates and inspects asphalt silos for wear.

The chief benefit of the Silobot inspection service is equipment inspection without entering the silo. It allows for safer and more efficient inspection. One would only need to enter the silo to perform any identified maintenance.

ASTEC, INC.

Voyager Series Plant



Astec is building on the success of the Voyager 120 portable asphalt plant and expanding its offerings in the highly portable segment with the development of the Voyager 140 portable asphalt plant. These highly portable plants from Astec are built to move quickly from site to site and start operating at each new site without delay. Unique for this market segment is the Voyager plants' ability to produce mix with reclaimed asphalt pavement (RAP).



INDUSTRIES SERVED:



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Portable Asphalt Plants
- Relocatable Asphalt Plants
- Stationary Asphalt Plants
- Soil Remediation Equipment
- Control Systems

REPORTING GROUP: INFRASTRUCTURE

LOCATIONS:

CHATTANOOGA, TENNESSEE, USA
PRAIRIE DU CHIEN, WISCONSIN, USA



ASTEC, INC.

Astec offers a complete line of portable, relocatable and stationary asphalt plant equipment and operates three manufacturing facilities: Chattanooga, Tennessee, USA, Rossville, Georgia, USA, and Prairie Du Chien, Wisconsin, USA.

Core products include the Double Barrel® drum mixer, the Dillman Unidrum® counter flow drum mixer, the Phoenix® burner series, the Six Pack® portable asphalt plant, the highly portable Voyager series asphalt plants, Astec's patented warm mix system, and New Generation long-term storage silos.

Key milestones for Astec in 2018 include: participation in an enhanced QED (Quality Education and Development) program; the launch of new Sales and Operation Planning procedures; exhibiting at the Intermat tradefair in Paris, France; and the completion of the inaugural Silobot in-field silo inspections.

Astec established a new safety benchmark by ending the year with a 0.77 recordable incident rate, an accomplishment well below the 4.0 industry average incident rate.

Astec is optimistic about future prospects and plans to continue to position itself to take full advantage of opportunities both domestically and abroad. Astec continues to grow and maintain customer loyalty through innovative equipment designs, industry leading customer service and state-of-the-art technical education.

“ASTEC offers a complete line of portable, relocatable and stationary asphalt plant equipment.”



INFRASTRUCTURE



DOUBLE BARREL® PLANT



SILOBOT™



PHOENIX® TALON II™ BURNER



PORTABLE DOUBLE BARREL® PLANT



DILLMAN UNIDRUM® PLANT



PLANT PROCESS CONTROL SYSTEMS



INDUSTRIES SERVED:



INFRASTRUCTURE



AGGREGATE AND MINING



ENERGY

PRODUCTS AND SERVICES:

- Asphalt Plants
- Milling Machines
- Cold In-Place Asphalt Recyclers
- Commercial-Class Asphalt Pavers
- Highway-Class Asphalt Pavers
- Material Transfer Vehicles
- Self-Propelled Brooms
- Aggregate Processing Equipment

REPORTING GROUP: INFRASTRUCTURE

LOCATION:

ACACIA RIDGE, QUEENSLAND, AUSTRALIA



ASTEC AUSTRALIA

Proudly one of Astec Industries' key global companies, Astec Australia continues to grow business internationally for Astec's Infrastructure, Aggregate and Mining, and Energy Groups.

INFRASTRUCTURE GROUP

2018 was Australia's second record sales year in a row for Roadtec and Carlson paving products. The first new 'narrow width' Roadtec RP170ex and the first new Carlson CP130 were delivered.

AGGREGATE AND MINING GROUP

The Aggregate and Mining Group had a strong year in materials processing products for JCI, AMS and KPI. Astec will supply all the crushers and screens, from the primary jaw to the finishing screens, for a new 500tph aggregate plant in Victoria.

PARTS AND SERVICE

Committed to providing customers with the best service and support in the industries we serve, the company again recorded its strongest ever sales year in after-market products.

DISTRIBUTION AND SERVICE CENTERS

Adding to existing centers in Brisbane and Perth, a sales, parts and service center was opened in Melbourne, Victoria in July 2018. In May 2019, a sales, parts and service center will be established in Sydney, New South Wales.

New products planned for promotion and introduction to the market in 2019 are Astec Inc's International Batch Plant, Carlson's new 6' paver, and Astec Mobile Screens ProSizer purpose-built for the Australian/International market.

“Exclusively representing Astec Industries family of companies, Astec Australia continues to grow business internationally for Astec's Infrastructure, Aggregate and Mining and Energy Groups.”



INFRASTRUCTURE



VOYAGER 120



GT205MF



RP190EX



FT2618VM



RX600EX



HEATEC TANK PLANT



INDUSTRIES SERVED:



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Highway-Class Asphalt Screeds
- Commercial-Class Asphalt Pavers
- Mobile Equipment Lighting
- Asphalt Screed Attachments

REPORTING GROUP: INFRASTRUCTURE

LOCATION: TACOMA, WASHINGTON, USA



CARLSON PAVING PRODUCTS

Located in Tacoma, Washington, Carlson Paving Products has grown to become the asphalt paving industry's leader in highway-class asphalt screeds, commercial-class paver platforms, and attachment innovations that enhance the safety and longevity of roadways.

The established market leader among asphalt screed manufacturers in North America and Australia, Carlson achieved a new milestone with the release of the company's first 8-foot, rear-mount screed in the EZR208. In conjunction with the company's six other highway-class screed models and the ability to mount to all North American tractors built by the major paver manufacturers, Carlson's line of the EZIII, EZIV, EZV and EZR2 platforms remain the contractor's most demanded screed regardless of the tractor decal.

Carlson continues to emerge as one of the fastest growing small paver brands in the commercial-class market and has quickly become the contractor's choice for performance, machine lifecycle and mat quality. With a full line of four commercial pavers for the North American market, Carlson followed up a historic 2017 with the release and delivery of export oriented variants of its CP100 II and CP130 platforms.

With its continuously growing product line and increasing demand, Carlson broke ground in 2018 on a massive 80,000 sq. ft. expansion to the company's existing factory that will come online by 2020. With enhanced manufacturing space and continued dedication to our customers, Carlson enters 2019 poised to take advantage of emerging opportunities and deliver innovative solutions for the commercial and highway-class contractor in North America and around the globe.

“ Carlson Paving Products has grown to become the asphalt paving industry's leader in highway-class asphalt screeds, commercial-class paver platforms and attachment innovations.”



INFRASTRUCTURE



EZR210



EZR210



CP100



EZR208



LED BLADE LIGHT



EZIV10



INDUSTRIES SERVED:



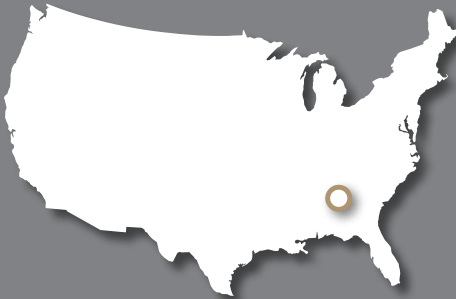
INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Milling Machines
 - Cold In-Place Asphalt Recyclers
 - Highway Class Asphalt Pavers
 - Material Transfer Vehicles
 - Self-Propelled Brooms
 - Soil Stabilizers
-

REPORTING GROUP: INFRASTRUCTURE

LOCATION: CHATTANOOGA, TENNESSEE, USA



ROADTEC

Roadtec was founded almost four decades ago as a manufacturer of asphalt pavers. Today Roadtec continues to lead the industry in asphalt pavers and material transfer vehicles. Roadtec is also the consistent frontrunner in cold planers, soil stabilizers, and brooms.

In 2018, Roadtec maximized growth by updating and upgrading machines, expanding their dealer network, and refining the industry-leading Guardian™ Telematics System. Customer-focused service and support enabled the company to gain competitor market share.

The Roadtec product line grew with the addition of the RP-250e Asphalt Paver and the SX-5e Soil Stabilizer/Reclaimer. The RX-700 and RX 900 Cold Planers were upgraded to increase horsepower and productivity.

The Roadtec dealer network, initiated in 2016, saw continued expansion in 2018. The dealer network allows the company to grow sales, while providing responsive local service, reinforcing trust and brand loyalty.

Guardian Telematics, the industry's only two-way telematics system, was enhanced to provide increased functionality, faster speeds, and better maneuverability. Guardian continues to deliver best in class fleet management through real time reporting, saving customers time and money.

“In 2019 Roadtec will continue to lead the industry in innovative design, rugged dependability, and unmatched service.”



INFRASTRUCTURE



MATERIAL TRANSFER VEHICLES



COLD IN-PLACE ASPHALT RECYCLERS



HIGHWAY CLASS ASPHALT PAVERS



GUARDIAN TELEMATICS



HIGHWAY CLASS ASPHALT PAVERS



MILLING MACHINES



INDUSTRIES SERVED:

-  AGGREGATE AND MINING
-  INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Mobile Screening Plants
- Portable Screening Plants
- Stationary Screen Structures
- High-Frequency Screens
- Crushing and Vibrating Equipment
- Asphalt Production Equipment

REPORTING GROUP: AGGREGATE AND MINING

LOCATION:

VESPASIANO, MINAS GERAIS, BRASIL



ASTEC DO BRASIL

Located in Vespasiano, Minas Gerais, Brasil, Astec do Brasil produces a complete line of equipment including crushers, vibrating screens, portable plants and asphalt plants. Astec do Brasil also markets and supports the equipment of other Astec Industries' companies such as track mounted equipment, material transfer vehicles and scalers.

With the delivery and startup of complete crushing plants manufactured in the new facility, Astec do Brasil has become an important supplier for the aggregate, mining and infrastructure segments of the market. The goal is to become the leader in the Brazilian market, while expanding throughout the Latin American market. Shipment of equipment to Argentina and Colombia has already begun.

Astec do Brasil continues to increase its line of products and, in 2018, began making the AMS Vari Vibe® Screen in Brazil. The Vari Vibe Screen is a success with customers and an important product for Astec do Brasil.

Parts sales are growing and represent an opportunity for Astec do Brasil going forward.

To complement its existing products, Astec do Brasil has expanded its offering of wear parts and liners for the mining industry, including liners and parts for competitive equipment.

After a multi-year economic downturn Astec do Brasil is experiencing the return of existing customers for its equipment, including TelSmith crushers, screens, and now AMS high frequency screens. Improved local stability is expected to assist in providing opportunities for Astec do Brasil.

“Astec do Brasil continues to increase its line of products, with a focus on safety, quality, productivity and customer satisfaction.”



AGGREGATE AND MINING



H3244 JAW CRUSHER



2612V VARI VIBE SCREEN



V120 ASPHALT PLANT



HFS20 SCALER



44SBS CONE CRUSHERS



SPARE AND WEAR PARTS



2612V VARI VIBE SCREEN



INDUSTRIES SERVED:

-  AGGREGATE AND MINING
-  INFRASTRUCTURE
-  ENERGY

PRODUCTS AND SERVICES:

- Track-Mounted Screening Plants
- Stationary Screen Structures
- Portable Screening Plants
- High-Frequency and Multi-Frequency Screens
- ProSizer® Plants

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: STERLING, ILLINOIS, USA



ASTEC MOBILE SCREENS

Astec Mobile Screens, Inc. is recognized as a global leader in screening solutions. Marketed together with the Kolberg-Pioneer (KPI) and Johnson Crushers International (JCI) brands, the company's products include mobile screening plants, portable and stationary screen structures, and high-frequency screens for quarry, recycle, sand and gravel, industrial and other material processing industries.

Astec Mobile Screens was founded in 1976 in Sterling, Illinois. The company has grown to employ over 125 people and to occupy 70,000 square feet of manufacturing space, as well as another 7,500 square feet of recently-added parts storage.

In 2018, Astec Mobile Screens expanded its popular, multi-frequency screen line. After the successful launch of the GT205, Astec Mobile Screens designed and began manufacturing multi-frequency technology for its portable PTSC205 plants, GT145 track screens and the rest of its 5' wide, two deck screens.

Astec Mobile Screens also built its first 6' x 24' high frequency screen in 2018. High frequency screen decks are driven by variable-speed hydraulic vibrators for optimal screen efficiency and offer ideal gradation control for reclaiming fines in both wet and dry applications.

Astec Mobile Screens provides fast, precise parts and service support thanks to an integrated relationship with sales, engineering, manufacturing, and dealer personnel. Producers can expect unparalleled customer service that is demonstrated every day through the company's continuous devotion to meeting the needs of its customers.

“Astec Mobile Screens, Inc. is recognized as a global leader in screening solutions.”





FT3620 SCREEN



RAP PROCESSING PLANT



PTSC205 MULTI-FREQUENCY SCREEN



GT104 SCREEN



HFS20 SCALER



GT145 MULTI-FREQUENCY SCREEN

INDUSTRIES SERVED:

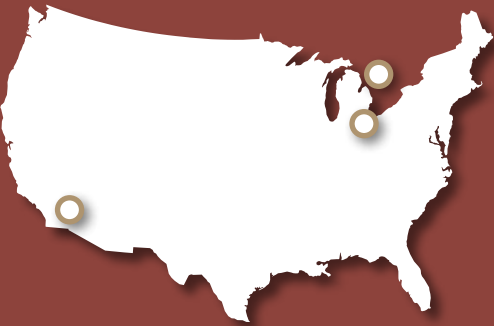
-  AGGREGATE AND MINING
-  INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Mine, Quarry and Construction Equipment
- Stationary Rockbreaker Systems
- Hydraulic Breakers
- Underground Mobile Rockbreakers
- Underground Mechanized Scalers
- Underground Utility Vehicles
- Demolition and Construction Attachments

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: THORNBURY, ONTARIO, CANADA
RIVERSIDE, CALIFORNIA, USA
OLON, OHIO, USA



BREAKER TECHNOLOGY

Breaker Technology is the worldwide rockbreaking expert in the mining and quarrying industries. For 60 years, Breaker Technology has been helping companies power their productivity and break into profitability. BTI offers over a dozen different rockbreaker system models for breaking oversize at large gyratories, grizzlies, jaw and impact crushers in stationary and portable applications. With over 2,000 successful installations, Breaker Technology's rockbreaker systems are custom fitted to the application for maximum endurance.

Manufacturing and distributing a wide-range of underground mining vehicles is at the core of Breaker Technology's product line. The latest additions, ScaleBOSS 3D/3DE and Mine Runner, continue to grow in the marketplace where comfort and reliability are key to operator adoption and productivity.

BTI also distributes a wide range of excavator attachments, which includes hydraulic rockbreakers, demolition attachments and compactors. The attachment line is known to be some of the most efficient attachments in North America.

Situated along the south shore of Georgian Bay in Thornbury, Ontario, Breaker Technology has a highly qualified sales and dealer network, a depth of engineering experience, dedicated and professional service and support and a commitment to superior customer service, remaining a trusted brand in today's aggregate and mining industries.

“For nearly 60 years, BTI has been helping companies power their productivity and break into profitability.”



MRH25 ROCKBREAKER SYSTEM



SCALEBOSS 3D/ 3DE



BX20 BREAKER



EXC80 MECHANICAL PULVERIZER



MBS125 ROCKBREAKER SYSTEM



KPI-JCI
ASTEC COMPANIES

INDUSTRIES SERVED:



AGGREGATE AND MINING



INFRASTRUCTURE



ENERGY

PRODUCTS AND SERVICES:

- Crushing Equipment
- Screening Equipment
- Stationary, Portable and Modular Systems
- Track-mounted Equipment
- Rebuild and Repair Centers

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: EUGENE, OREGON, USA



JOHNSON CRUSHERS INTERNATIONAL

Johnson Crushers International, Inc. (JCI) is a global leader in engineering and manufacturing full lines of cone crushers, combo, horizontal and incline vibrating screens, as well as track-mounted, portable and stationary crushing and screening plants. Marketed together with the Kolberg-Pioneer (KPI) and Astec Mobile Screens brands, JCI is committed to meeting consumer demand in the aggregate, construction, mining, industrial and recycling industries.

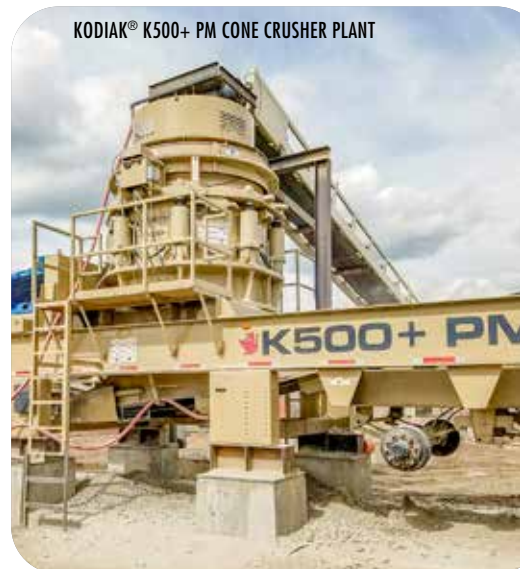
Johnson Crushers International, located in Eugene, Oregon, was founded in 1995. Its operation consists of nearly 300 employees and 145,000 square feet of manufacturing space. At the start of 2018, JCI was honored by the Springfield, Oregon Chamber of Commerce as the Business of the Year for the positive impact it has had on the city of Springfield and its residents.

JCI is introducing a new model, the K350+ to its line of Kodiak® Plus cone crushers. Like other cones in the Kodiak® Plus cone crusher series, the K350+ will feature an industry-leading tramp iron relief system, fully-protected internal counterweights, precision roller bearing design, patented liner retention system and 360° thread locking ring for consistent product quality.

JCI provides fast, precise parts and service support thanks to an integrated relationship with sales, engineering, manufacturing and dealer personnel. Producers can expect unparalleled customer service that is demonstrated every day through the company's continuous devotion to meeting the needs of its customers.

“Manufacturing full lines of cone crushers, horizontal and incline vibrating screens and track-mounted, portable and stationary crushing and screening plants.”







KPI-JCI
ASTEC COMPANIES

INDUSTRIES SERVED:



AGGREGATE AND MINING



INFRASTRUCTURE



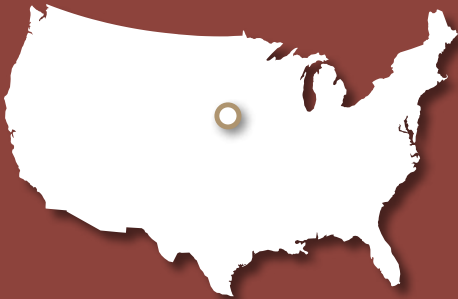
ENERGY

PRODUCTS AND SERVICES:

- Material Handling Equipment
- Crushing Equipment
- Screening Equipment
- Track-Mounted Equipment
- Washing and Classifying Equipment
- Portable Equipment
- Stationary Equipment

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: YANKTON, SOUTH DAKOTA, USA



KOLBERG-PIONEER

Kolberg-Pioneer, Inc. (KPI) has led the marketplace in designing and manufacturing powerful equipment for the aggregate, construction, mining, industrial and recycling industries. Marketed together with the Johnson Crushers International (JCI) and Astec Mobile Screens brands, KPI manufactures complete lines of crushing, screening, material handling, and washing and classifying equipment in stationary, portable and mobile configurations.

Kolberg-Pioneer, founded in 1928, is headquartered in Yankton, South Dakota. The company employs a staff of nearly 500 employees and utilizes over 300,000 square feet of manufacturing space.

KPI offers a full line of crushing and screening equipment including jaw crushers, horizontal shaft impactors, vertical shaft impactors and a variety of vibrating screens. KPI also produces a variety of washing and classifying equipment from coarse and fine material washers to blademills, classifying tanks, dewatering screens, log washers and complete washing systems. The company also manufactures material handling equipment including pugmills, radial stackers, SuperStacker® telescoping conveyors, transfer conveyors, feed systems, truck unloaders and stationary conveying systems. Kolberg-Pioneer also offers a variety of track-mounted crushing plants.

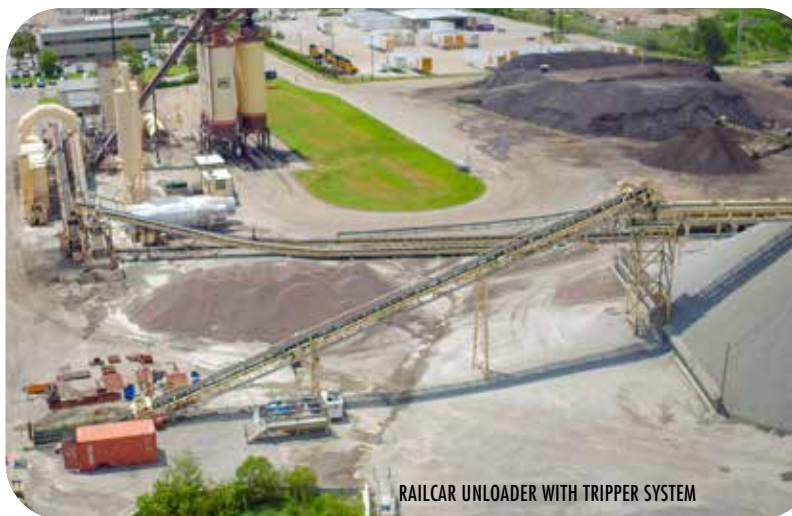
Kolberg-Pioneer provides fast, precise parts and service support thanks to an integrated relationship with sales, engineering, manufacturing and dealer personnel. Producers can expect unparalleled customer service that is demonstrated every day through the company's continuous devotion to meeting the needs of its customers.

“KPI manufactures complete lines of crushing, screening, material handling and washing and classifying equipment in stationary, portable and mobile configurations.”





SUPERSTACKER
TELESCOPING STACKER



RAILCAR UNLOADER WITH TRIPPER SYSTEM



FINE MATERIAL WASHER



RAP PROCESSING PLANT



WASHING SPREAD



INDUSTRIES SERVED:



AGGREGATE AND MINING



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Jaw and Cone Crushers
- Modular Crushing Plants
- Coal Crushers
- Vibrating Screens
- Aggregate Feeders and Conveyors
- Rotary Scrubbers

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: JOHANNESBURG, SOUTH AFRICA



OSBORN ENGINEERED PRODUCTS

Osborn designs, engineers, manufactures, markets, and provides full aftermarket support for a well-established range of mineral processing equipment. Osborn's primary market is in the mining industry, followed by the aggregate and metallurgical industries.

Osborn has been recommended for ISO:9001:2015 certification for quality assurance and offers the following equipment of its own design: single- and double-toggle jaw crushers, rotary breakers, roll crushers, ring crushers, grinding mills, out-of-balance or exciter-driven screens and feeders, apron feeders as well as modular and "containerized" crusher and screening systems. Complementing its own designed range of products Osborn also manufactures, markets and supports, under license, products from Telsmith and Kolberg-Pioneer.

Three units of Osborn's new D3 apron feeder range, which were developed in 2017, were successfully commissioned at the largest iron ore mine in South Africa. The performance of the three units, the smallest offering within Osborn's apron feeder range, bodes well for future sales in difficult to access applications.

“Osborn designs, engineers, manufactures, markets and provides full after-market support for a well-established range of mineral processing equipment.”



38 CONE MODULAR



SCREEN MODULAR



OSBORN 36 X 16 FEEDER



6 X 20 DOUBLE DECK SCREEN MODULAR



38 CONE MODULAR AND 25 X 40 JAW CRUSHER



INDUSTRIES SERVED:



AGGREGATE AND MINING



INFRASTRUCTURE



ENERGY

PRODUCTS AND SERVICES:

- Shiploaders and Unloaders
- Bulk Reception Feeders
- Radial Telescopic Stackers
- Mobile Truck Unloaders
- Track-Mounted Conveyors
- Reclaim Hoppers
- Mobile Truck Unloaders

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: OMAGH, NORTHERN IRELAND



TELESTACK

Telestack's products include shiploaders, ship unloaders, bulk reception feeders, radial telescopic stackers, mobile hopper feeders, track mounted conveyors and reclaim hoppers and their customized solutions are used for vessel loading/unloading, stacking, reclaiming and rail wagon loading/unloading of a range of dry bulk materials. The end users are some of the largest companies in their chosen industries and they repeatedly rely on Telestack's proven record of performance to develop customized solutions for their bulk handling facilities.

Externally audited quality procedures ensure Telestack has the processes in place to deliver what the customer ordered on time, within budget and to the high standards required by large multi-national companies. Robust designs and innovative assembly designs allow Telestack equipment to be easily packed into shipping containers and quickly assembled on site anywhere in the world ensuring Telestack is competitive globally.

Telestack continues to invest heavily in their Northern Ireland facility as part of a long term strategy to future proof their capacity and to support the development of an extensive range of world-class, innovative and quality products. Demonstrating enviable year on year growth, Telestack is now globally regarded as one of the world's leading manufacturers in the global material handling industry; designing, manufacturing, and exporting from their base in Northern Ireland.

“One of the world's leading manufacturers in the global material handling industry.”





TB42 RADIAL TELESCOPIC SHIPLOADER



TS2060 RADIAL TELESCOPIC



TS1550 RADIAL TELESCOPIC



TS650 RADIAL TELESCOPIC SHIPLOADER



LF520 STOCKPILING



TS850 STOCKPILING FROM TC621 & TU815



TB58 ALL WHEEL TRAVEL EXPORT SHIPLOADER



OLYMPIAN W1800 DRIVE OVER TRUCK UNLOADER



INDUSTRIES SERVED:



AGGREGATE AND MINING



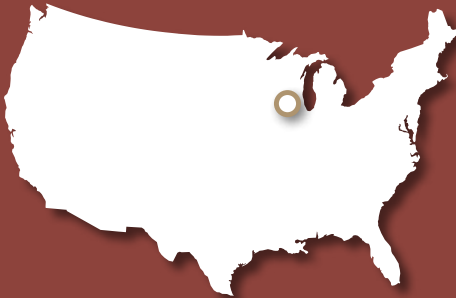
INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Cone, Jaw and Impact Crushers
- Inclined and Horizontal Screens
- Vibrating Feeders
- Track and Wheel Mobile Plants
- Modular Crushing & Screening Plants
- Stationary Conveyors
- Motor Control Systems
- Processing Plant Design, Build and Installation
- Existing Crushing Plant Optimization
- Equipment Rebuild & Service

REPORTING GROUP: AGGREGATE AND MINING

LOCATION: MEQUON, WISCONSIN, USA



TELSMITH

For over 110 years, Telsmith, Inc. has provided integrated minerals processing solutions to the global aggregate and mining industries through a commitment to ethical business practices, technologically advanced products, manufacturing excellence and world-class customer support.

With a focus on improving efficiency, profitability, and safety in customer operations, Telsmith designs and manufactures processing equipment for the reduction and sizing of raw material. Industries served include precious metals mining, processing of aggregates for construction materials, and recycling of recovered materials including concrete, asphalt and steel slag. Core products include jaw crushers, cone crushers, impact crushers, vibrating screens and feeders.

In addition to core components, Telsmith also designs and manufactures complete processing systems. Telsmith capabilities include custom solutions ranging from mobile crushing systems to large modular processing plants that deliver high volume production with low operating costs. Offering a full spectrum of services including conceptual design, engineering and construction management, Telsmith brings a truly integrated package of solutions to the market place.

Over the last eight years, Telsmith has developed two completely new product lines consisting of our Hydra-Jaw® crushers and our T-Series™ cone crushers. Together these two product lines consist of eight different crushers currently being sold throughout the world. Developing these crusher lines at an unprecedented rate puts Telsmith in the enviable position to leverage true product differentiation. The Hydra-Jaw® crusher provides industry leading use of hydraulics to adjust the crusher setting, provide overload relief and crush/clear the chamber. The T-Series™ cone utilizes an industry first hybrid bearing which reduces the cost of ownership and allows for the highest crushing forces.

“Telsmith designs and manufactures processing equipment for the reduction and sizing of raw material.”



AGGREGATE AND MINING



T300 PORTABLE CONE CRUSHER



IRON GIANT JAW CRUSHER



H2250 PORTABLE JAW PLANT



38SBS CONE CRUSHER CLOSED CIRCUIT PLANT



H3244 PORTABLE JAW PLANT



MODULAR CRUSHING PLANT



INDUSTRIES SERVED:



ENERGY



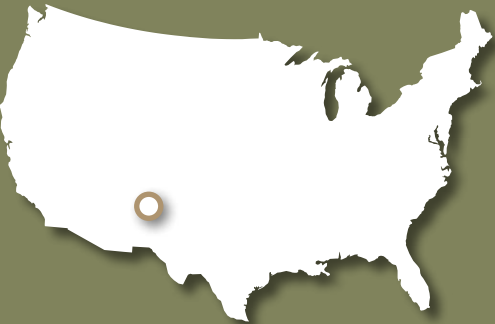
INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Asphalt-Rubber Blending Systems
- Hot Oil Heaters
- Asphalt Storage Tanks
- Heavy Fuel Preheaters
- Emission Control Equipment
- Liquid Additive Systems
- Asphalt Storage Tanks
- Concrete Plants

REPORTING GROUP: ENERGY

LOCATION: ALBUQUERQUE, NEW MEXICO, USA



CEI ENTERPRISES

Founded in 1969, CEI Enterprises is an American manufacturer of equipment used in various aspects of the construction industry. CEI's 50-year manufacturing history includes equipment used for heating and storing liquid asphalt, asphalt production, modified bitumen blending, water heating and storage, and concrete production. CEI also provides manufacturing and fabrication services to numerous other Astec companies.

One of CEI's core product lines is the circulating hot oil heater. These heat and circulate heat transfer oil, which then provides heat to other equipment, such as asphalt storage tanks, fuel preheaters, and other components found at asphalt mixing plants. CEI has remained a well-known and trusted brand of these heaters for a half-century. Today, CEI produces hot oil heaters in both helical coil and jacketed firebox designs.

Another core product for CEI is the company's line of storage tanks for liquid asphalt. These heated tanks are available in a variety of configurations, including portable models as well as horizontal and vertical stationary models. Capacities range from 5,000 to 40,000 gallons. Heating options include thermal oil, electric, and direct-fired.

CEI is an industry leader in asphalt-rubber blending systems. These systems mix ground rubber from recycled tires with liquid asphalt in a high-specification process that results in better, longer-lasting roads.

In addition to these and many other products, CEI Enterprises offers worldwide parts and service support, as well as training.

“CEI Enterprises of Albuquerque, NM designs, produces and services mixing equipment for both concrete and modified asphalt materials.”



ENERGY



ASPHALT-RUBBER BLENDING SYSTEM



ECOHEAT™ DIRECT-CONTACT WATER HEATER



COMBINATION TANK FOR STORING BOTH LIQUID ASPHALT AND FUEL OIL



HELICAL COIL HOT OIL HEATER



JACKETED FIREBOX HEATERS



ASPHALT STORAGE TANKS



INDUSTRIES SERVED:



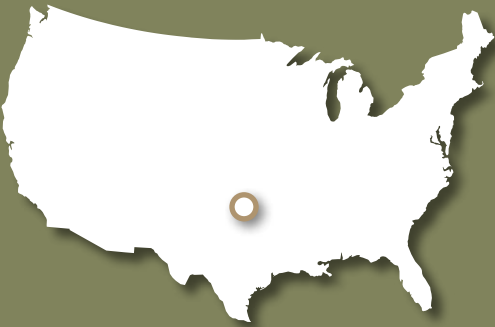
ENERGY

PRODUCTS AND SERVICES:

- Fluid Pump Trailers
- Drills for Oil and Gas
- Water Well Drills
- Drills for Mining Core Samples

REPORTING GROUP: ENERGY

LOCATION: ENID, OKLAHOMA, USA



GEFCO

GEFCO, Inc. is a known leader in the development and manufacture of reliable and safe drilling equipment and related products. Our experienced engineers design a diverse line of products allowing us to serve various industries including water well, environmental, groundwater monitoring, construction, mining, and oil and gas exploration.

In operation for over eight decades, GEFCO is well known in the industry for our reliability and exceptional customer service. Our 260,000 sq. ft. plant is located in Enid, Oklahoma. Our state-of-the-art manufacturing facility includes a fully-integrated machine shop, fabrication and weld shop, assembly, painting and testing facility.

As a global company, with products delivered to over 100 countries, we are focused on remaining competitive by researching and developing equipment that can be adapted for various terrains, climates and demanding conditions.

We are committed to producing high quality products, exceptional customer support and outstanding value. It is our priority to exceed our customers' requirements and comply with our industry standards by promoting a continuous improvement culture for our products, processes and services.

“GEFCO, Inc. is a known leader in the development and manufacture of reliable and safe drilling equipment and related products.”



50K TRAILER MOUNT DRILLING RIG



40K DRILLING RIG



TITAN, DOUBLE PUMPER 2000



50K DRILLING RIG



SS 135 DRILLING RIG



15 POWER SWIVEL



FRAC PUMP 2500



DOUBLE PUMPER 2000



50K DRILLING RIG



INDUSTRIES SERVED:



ENERGY



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Thermal Fluid Heaters
- Process Heaters
- Asphalt Storage, Heating, and Blending Equipment
- Instantaneous Water Heaters
- Engineering Services for Asphalt Terminals and Emulsion Plants

REPORTING GROUP: ENERGY

LOCATION: CHATTANOOGA, TENNESSEE, USA



HEATEC

Heatec designs, manufactures and services heating and storage equipment. Helical coil heaters and asphalt storage tanks are its core products. Other products include electric heaters, water bath heaters, industrial tankless water heaters, convection heaters, thermal oxidizers, waste heat recovery units, polymer blending systems, emulsion blending plants, control systems, and more. Heatec products are used in a variety of industries, including hot mix asphalt plants, asphalt terminals, gas processing plants, food and beverage production facilities, chemical plants, and power plants. The company continues to adapt its products to meet the needs and standards of the international market and to configure the products for easy transport overseas.

In 2018, Heatec added new technologies to its manufacturing process to aid in building asphalt storage tanks with more efficiency, better quality, and a higher level of safety. The company continues to develop new computerized control systems that make it easier for its customers to be more productive. Its Recon® monitoring system continues to evolve. The newest version can transmit detailed information about a customer's asphalt tank farm through a cellular signal without having to hardwire into their network. A new line of dish bottom asphalt storage tanks was created. The dish bottom allows the tanks to be fully drained which drastically reduces the costs and time spent involved in cleaning the tanks.

The company is committed to offering training for its customers. The company offers several customer schools throughout the year at its training center to train operators and technicians that use Heatec products. In addition, the company continues to participate in Astec customer schools held in Chattanooga and to provide on-site training for operators at their facilities.

“Heatec products are used in a variety of industries, including hot mix asphalt plants, asphalt terminals, gas processing plants, food and beverage production facilities, chemical plants and power plants.”





GAS REGEN HEATER AND THERMAL FLUID HEATER



PROCESS BATH HEATERS



HMO HEATERS



THERMAL FLUID HEATER



EMULSION MILL SKID



ASPHALT TERMINAL



INDUSTRIES SERVED:



ENERGY



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Whole Tree Chippers
- Whole Tree Debarkers
- Horizontal Grinders
- Blower Trucks and Trailers
- Screening Equipment
- Asphalt Shingle Shredders

REPORTING GROUP: ENERGY

LOCATION: EUGENE, OREGON, USA



PETERSON PACIFIC CORP.

Peterson Pacific Corp. is a Eugene, Oregon based manufacturer of grinders, chippers, debarkers, screens, and blower trucks that serve a wide variety of markets. The company has 110,000 square feet of modern manufacturing space. Peterson machines are sold and supported through a worldwide network of distributors and direct sales and service representatives.

Peterson Horizontal Grinders reduce low value wood logs and other organic materials. The reduced material is used in the compost, mulch and biomass energy markets. Peterson grinders can also reduce certain construction and demolition materials, such as asphalt shingles, that can then be recycled and used in hot mix asphalt paving. Peterson drum and disc chippers and debarkers are used to produce wood chips for pulp and paper production as well as biomass energy markets. Peterson blower trucks and trailers are used to broadcast compost and mulch for landscaping and erosion control. Peterson deck screens are used for classifying materials to maximize the value of each product. Many Peterson machines are available in either electric or diesel power depending on the application. For increased mobility at a job site, both tracked and wheeled versions of many of their products are available.

Since 1981, Peterson has specialized in producing machines that turn low-grade organic materials into high value products.

“Peterson Pacific Corp. is a Eugene, Oregon based manufacturer of grinders, chippers, debarkers, screens, and blower trucks that serve a wide variety of markets.”





HORIZONTAL GRINDER



5700D HORIZONTAL GRINDER



3310 DRUMCHIPPER



BT60C BLOWER TRUCK



2700D HORIZONTAL GRINDER



5000H WHOLE TREE CHIPPER



INDUSTRIES SERVED:



ENERGY



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Forced Draft Burners
- Direct Fired Applications
- Indirect Fired Applications
- Control Systems
- Pump Sets
- Custom Engineered Systems

REPORTING GROUP: ENERGY

LOCATION: PARSONS, KANSAS, USA



POWER FLAME

Power Flame is nestled in the rich farmlands of Southeast Kansas in the town of Parsons. The hallmark of our 70 year-old company is the skilled craftsmen who design and hand-build our environmentally conscious burners from quality materials. The average length of service of our 182 employees is 12.5 years, which lends credibility to the quality of our products and the solid knowledge base that has developed strong customer relationships.

Our “design and build” product line is capable of converting liquid or gaseous fuels into useable energy and cover input capacities from 400,000 to 120,000,000 BTU/HR. Our combustion systems are offered through manufacturer representatives for retrofit to replace existing combustion equipment with new, state-of-the-art systems or directly to original equipment manufacturers’ customers for new packaged energy generating systems.

Power Flame has been able to use its proven advanced low and ultra-low emission technologies to expand sales on an international level by assisting environmental authorities to set new emission and efficiency standards to clean the air in new global markets.

In addition to these state-of-the-art combustion systems, Power Flame offers a wide range of operation control systems, which vary from simple relay-based logic to microprocessor-based controls to sophisticated PLC applications.

“Our products consist of “design and build” burners capable of converting liquid or gaseous fuels into usable energy.”





UCM SUB 15 ULTRA LOW NOX BURNER



STRAIGHT OIL TYPE C BURNER



CMAX BURNERS



UCM ULTRA LOW NOX BURNERS



UCM 600 ULTRA LOW NOX GAS ONLY BURNER



CMAX BURNERS



INDUSTRIES SERVED:



ENERGY



INFRASTRUCTURE

PRODUCTS AND SERVICES:

- Stationary Transit and Central Mix Concrete Batch Plants
- Portable Transit and Central Mix Concrete Batch Plants
- High Production Paving Concrete Batch Plants
- Tilt Mixers
- Controls
- Concrete Placing Equipment

REPORTING GROUP: ENERGY

LOCATION: BURLINGTON, WISCONSIN, USA



REXCON

RexCon manufactures a complete line of stationary and portable central mix and ready mix concrete batch plants. For decades, the RexCon product line has been an industry leader because of its quality design, durability and high-production capabilities.

RexCon participated in ConExpo 2017 in Las Vegas, Nevada, showcasing their highly-popular Mobile 12 Self-Erecting Central Mix Batch Plant. The self-supporting sub frame and superior hydraulic system reduces the need for site preparation, foundations and cranes. This plant is capable of producing approximately 250 cubic yards per hour.

RexCon was tasked with designing a highly custom concrete batch plant. The result: a batch plant that can produce 800 cubic yards of concrete per hour. With two gravity-fed dry lanes, and one central mix wet lane, it can charge three trucks simultaneously. In 2017, it finished the manufacturing and erection of the plant located in Chicago, Illinois near the O'Hare airport. It is currently the largest batch plant in the Midwest.

2017 was a significant year for RexCon. Not only did it have a record year for sales, but it also joined the Astec Industries family. RexCon is looking forward to continued growth, both domestically and internationally.

RexCon's reputation continues to be based on honesty and integrity, with devoted commitment to supporting customers, new and old, in a manner which ensures long-term loyalty to our products.

“RexCon manufactures a complete line of stationary and portable central mix and ready mix concrete batch plants.”



ENERGY



LOGO 12 TRANSIT MIX BATCH PLANT



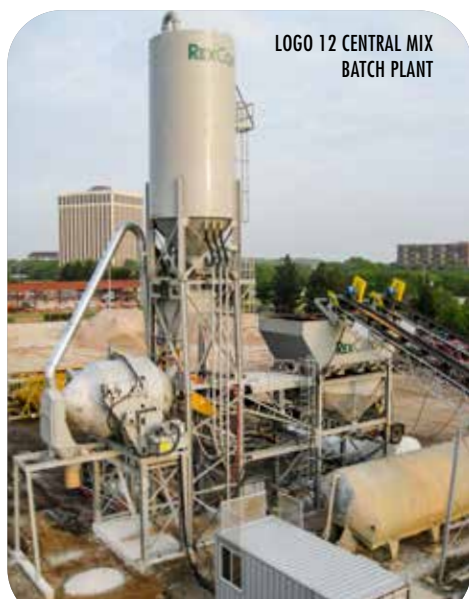
MODEL S BATCH PLANT WITH HORIZONTAL MIXER



REXBATCH 150 DUAL LANE WET/DRY PLANT



MOBILE 12 SELF-ERECTING CENTRAL MIX PLANT



LOGO 12 CENTRAL MIX BATCH PLANT



MOBILE 5 CENTRAL MIX BATCH PLANT

BOARD OF DIRECTORS



William D. Gehl
Chairman of the Board of
Astec Industries, Inc.
Chairman of the Board of
IBD Southeastern Wisconsin
Chairman of the Board of
FreightCar America
Member—Compensation Committee
Member—Audit Committee



James B. Baker
Co-Managing Director of
River Associates Investments, LLC
Chairman—Audit Committee
Member—Compensation Committee



Tracey H. Cook
President, (AMECO) American
Equipment Company, Inc.
Member—Audit Committee



William G. Dorey
Former Chief Executive Officer and
President of Granite Construction, Inc.
Chairman—Compensation Committee
Member—Audit Committee
Member—Nominating and
Corporate Governance Committee



Daniel K. Frierson
Chairman of the Board and
Chief Executive Officer of
the Dixie Group, Inc.
Chairman—Nominating and
Corporate Governance Committee
Member—Audit Committee
Member—Executive Committee



Charles F. Potts
Chairman of the Board
of Heritage Construction
and Materials
Member—Audit Committee
Member—Compensation Committee



William B. Sansom
Chairman of the Board and
Chief Executive Officer of
The H.T. Hackney Company
Member—Audit Committee
Member—Nominating and
Corporate Governance Committee



Brad Southern
CEO, Louisiana-Pacific Corp.
Member—Audit Committee



Glen E. Tellock
President and CEO of
Lakeside Foods
Member—Audit Committee
Member—Nominating and
Corporate Governance Committee

ASTEC INDUSTRIES' CORPORATE EXECUTIVE OFFICERS



Richard J. Dorris
Interim CEO
Chief Operating Officer



Jaco van der Merwe
Group President
Infrastructure



Jeff Schwarz
Group President
Aggregate and Mining



Scott Barker
Group President
Energy



David C. Silvius
Vice President,
Chief Financial Officer and Treasurer



Stephen C. Anderson
Vice President of Administration,
Corporate Secretary and
Director of Investor Relations



Robin A. Leffew
Corporate Controller

FINANCIAL INFORMATION

SELECTED CONSOLIDATED FINANCIAL DATA

(in thousands, except as noted*)

	2018	2017	2016	2015	2014
Consolidated Statement of Operations Data					
Net sales	\$ 1,171,599	\$ 1,184,739	\$ 1,147,431	\$ 983,157	\$ 975,595
Gross profit	135,766	243,129	265,269	218,843	215,316
Gross profit %	11.6%	20.5%	23.1%	22.3%	22.1%
Selling, general and administrative expenses	180,795	160,775	153,145	145,180	141,490
Research and development	28,332	26,817	24,969	23,676	22,129
Restructuring and asset impairment charges	13,060	--	--	--	--
Income (loss) from operations	(86,421)	55,537	87,155	49,987	51,697
Interest expense	(1,045)	(840)	(1,395)	(1,611)	(720)
Other income	536	1,218	529	3,055	1,207
Net income (loss)	(60,744)	37,590	54,988	31,966	34,206
Net income (loss) attributable to controlling interest	(60,449)	37,795	55,159	32,797	34,458
Earnings (loss) per common share*:					
Net income (loss) attributable to controlling interest					
Basic	(2.64)	1.64	2.40	1.43	1.51
Diluted	(2.64)	1.63	2.38	1.42	1.49
Consolidated Balance Sheet Data					
Working capital	\$ 371,760	\$ 423,823	\$ 407,972	\$ 399,785	\$ 388,862
Total assets	855,457	889,579	843,601	777,353	802,265
Short-term debt	--	--	4,632	--	2,814
Current maturities of long-term debt	413	2,469	2,538	4,528	1,027
Long-term debt, less current maturities	59,709	1,575	4,116	5,154	7,061
Total equity	585,290	686,765	648,841	609,858	596,152
Cash dividends declared per common share*	0.42	0.40	0.40	0.40	0.40
Book value per share at year-end (shareholders' equity / diluted shares outstanding for the year)*	25.53	29.58	27.99	26.30	25.62

SUPPLEMENTARY FINANCIAL DATA

(in thousands, except as noted*)

Quarterly Financial Highlights (Unaudited)		First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2018	Net sales	\$ 325,453	\$ 272,528	\$ 256,613	\$ 317,005
	Gross profit (loss)	78,005	1,108	58,284	(1,631)
	Net income (loss)	20,216	(40,768)	6,903	(47,095)
	Net income (loss) attributable to controlling interest	20,267	(40,674)	6,995	(47,037)
	Earnings (loss) per common share*				
	Net income (loss) attributable to controlling interest:				
	Basic	0.88	(1.76)	0.31	(2.08)
	Diluted	0.87	(1.76)	0.30	(2.08)
	Dividends paid	0.10	0.10	0.11	0.11
2017	Net sales	\$ 318,401	\$ 301,909	\$ 252,054	\$ 312,375
	Gross profit	75,771	65,524	39,084	62,750
	Net income (loss)	15,080	14,359	(2,703)	10,854
	Net income (loss) attributable to controlling interest	15,120	14,420	(2,667)	10,922
	Earnings (loss) per common share*				
	Net income (loss) attributable to controlling interest:				
	Basic	0.66	0.63	(0.12)	0.47
	Diluted	0.65	0.62	(0.12)	0.47
	Dividends paid	0.10	0.10	0.10	0.10
Common Stock Price*					
	2018 High	\$ 64.80	\$ 61.61	\$ 63.69	\$ 52.88
	2018 Low	53.89	52.84	44.92	27.86
	2017 High	\$ 73.37	\$ 66.66	\$ 58.06	\$ 59.22
	2017 Low	59.02	52.35	45.70	48.44

The Company's common stock is traded in the Nasdaq National Market under the symbol ASTE. Prices shown are the high and low sales prices as announced by the Nasdaq National Market. As determined by the proxy search on the record date for the Company's 2019 annual shareholders' meeting, the number of holders of record is approximately 210.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

(Dollar and share amounts in thousands, except per share amounts, unless otherwise specified)

The following discussion contains forward-looking statements that involve inherent risks and uncertainties. Actual results may differ materially from those contained in these forward-looking statements. For additional information regarding forward-looking statements, see "Forward-looking Statements" on page 64.

Overview

The Company is a leading manufacturer and seller of equipment for the road building, aggregate processing, geothermal, water, oil and gas, and wood processing industries. The Company's businesses:

- design, engineer, manufacture and market equipment used in each phase of road building, including mining, quarrying and crushing the aggregate, mobile bulk and material handling solutions, producing asphalt or concrete, recycling old asphalt or concrete and applying the asphalt;
- design, engineer, manufacture and market additional equipment and components, including equipment for geothermal drilling, oil and natural gas drilling, industrial heat transfer, wood chipping and grinding, commercial and industrial burners, combustion control systems; and
- manufacture and sell replacement parts for equipment in each of its product lines.

The Company, as we refer to it herein, consists of a total of 22 companies that are consolidated in our financial statements, which include 17 manufacturing companies, three companies that operate as dealers for the manufacturing companies, a captive insurance company and the parent company. The companies fall within three reportable operating segments: the Infrastructure Group, the Aggregate and Mining Group and the Energy Group.

Infrastructure Group - This segment consists of five business units, three of which design, engineer, manufacture and market a complete line of asphalt plants, asphalt pavers and related components and ancillary equipment. The two remaining companies in the Infrastructure Group are Company-owned dealers which sell, service and install equipment produced by the manufacturing subsidiaries of the Company, with the majority of sales to the infrastructure industry. The Company-owned dealer in Germany is being closed in 2019 and its assets liquidated.

Aggregate and Mining Group - This segment consists of eight business units that design, manufacture and market heavy equipment and parts in the aggregate, metallic mining, quarrying, recycling, ports and bulk handling industries.

Energy Group - This segment consists of six business units that design, manufacture and market heaters, gas, oil and combination gas/oil burners, combustion control systems, drilling rigs, concrete plants, wood chippers and grinders, pump trailers, commercial and industrial burners, combustion control systems, storage equipment and related parts to the oil and gas, construction, and water well industries. RexCon, Inc. was added to this group effective October 1, 2017 as described below.

Individual Company subsidiaries included in the composition of the Company's segments are as follows:

1. **Infrastructure Group** – Astec, Inc., Roadtec, Inc., Carlson Paving Products, Inc., Astec Australia, Pty Ltd and Astec Mobile Machinery GmbH (which is being dissolved in 2019).
2. **Aggregate and Mining Group** – Telsmith, Inc., Kolberg-Pioneer, Inc., Johnson Crushers International, Inc., Osborn Engineered Products SA (Pty) Ltd, Breaker Technology, Inc., Astec Mobile Screens, Inc., Astec do Brasil Fabricacao de Equipamentos LTDA and Telestack Limited.
3. **Energy Group** – Heatec, Inc., CEI, Inc., GEFCO, Inc., Peterson Pacific Corp., Power Flame Incorporated and RexCon, Inc. Power Flame Incorporated was acquired and added to the group in August 2016. RexCon, Inc. was added to the group upon its formation and acquired substantially all of the assets and liabilities of RexCon LLC in October 2017.

The Company also has one other category, Corporate, that contains the business units that do not meet the requirements for separate disclosure as a separate operating segment or inclusion in one of the other reporting segments. The business units in the Corporate category are Astec Insurance Company ("Astec Insurance" or "the captive"), Astec Industries LatAm SpA, a Company-owned distributor in Chile in the start-up phase of operations and Astec Industries, Inc., the parent company.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

The Company's financial performance is affected by a number of factors, including the cyclical nature and varying conditions of the markets it serves. Demand in these markets fluctuates in response to overall economic conditions and is particularly sensitive to the amount of public sector spending on infrastructure development, privately funded infrastructure development, changes in the prices of liquid asphalt, oil and natural gas and steel.

Federal funding provides a significant portion of all highway, street, roadway and parking construction in the United States. The Company believes that federal highway funding influences the purchasing decisions of the Company's customers, who are typically more comfortable making capital equipment purchases with long-term federal legislation in place.

In July 2012, the "Moving Ahead for Progress in the 21st Century Act" ("Map-21") was approved by the U.S. federal government, which authorized \$105 billion of federal spending on highway and public transportation programs through fiscal year 2014. In August 2014, the U.S. government approved short-term funding of \$10.8 billion through May 2015. Federal transportation funding operated on short-term appropriations until December 4, 2015 when the Fixing America's Surface Transportation Act ("FAST Act") was signed into law. The \$305 billion FAST Act approved funding for highways of approximately \$205 billion and transit projects of approximately \$48 billion for the five-year period ending September 30, 2020.

The Company believes a multi-year highway program (such as the FAST Act) will have the greatest positive impact on the road construction industry and allows its customers to plan and execute longer-term projects. Given the inherent uncertainty in the political process, the level of governmental funding for federal highway projects will similarly continue to be uncertain. Since elected in late 2016, the current executive branch of the federal government has stressed that one of its priorities is a new infrastructure bill including increased funding for roads, bridges, tunnels, airports, railroads, ports and waterways, pipelines, clean water infrastructure, energy infrastructure and telecommunication needs. Proposals being considered may rely in part on direct federal spending as well as increased private sector funding in exchange for federal tax credits. Governmental funding that is committed or earmarked for federal highway projects is always subject to repeal or reduction. Although continued funding under the FAST Act or funding of a bill passed by the new administration is expected, it may be at lower levels than originally approved or anticipated. In addition, Congress could pass legislation in future sessions that would allow for diversion of previously appropriated highway funds for other purposes, or it could restrict funding of infrastructure projects unless states comply with certain federal policies. The level of future federal highway construction is uncertain and any future funding may be at levels lower than those currently approved or that have been approved in the past.

The public sector spending described above is needed to fund road, bridge and mass transit improvements. The Company believes that increased funding is unquestionably needed to restore the nation's highways to a quality level required for safety, fuel efficiency and mitigation of congestion. In the Company's opinion, amounts needed for such improvements are significantly greater than amounts approved to date, and funding mechanisms such as the federal usage fee per gallon of gasoline, which is still at the 1993 level of 18.4 cents per gallon, would likely need to be increased along with other measures to generate the funds needed.

In addition to public sector funding, the economies in the markets the Company serves, the price of liquid asphalt, the price of oil and natural gas, and the price of steel may each affect the Company's financial performance. Economic downturns generally result in decreased purchasing by the Company's customers, which, in turn, causes reductions in sales and increased pricing pressure on the Company's products. Rising interest rates also typically negatively impact customers' attitudes toward purchasing equipment. The Federal Reserve has maintained historically low interest rates in response to the economic downturn which began in 2009; however, the Federal Reserve has increased the Federal Funds Rate several times in recent quarters, beginning in December 2016 and future rate increases are expected; however, the current Federal Funds Rate is still considered in the historically low range.

Significant portions of the Company's revenues from the Infrastructure Group relate to the sale of equipment involved in the production, handling, recycling or application of asphalt mix. Liquid asphalt is a by-product of oil refining. An increase or decrease in the price of oil impacts the cost of asphalt, which is likely to alter demand for asphalt and therefore affect demand for certain Company products. While increasing oil prices may have a negative financial impact on many of the Company's customers, the Company's equipment can use a significant amount of recycled asphalt pavement, thereby partially mitigating the effect of increased oil prices on the final cost of asphalt for the customer. The Company continues to develop products and initiatives to reduce the amount of oil and related products required to produce asphalt. Oil price volatility makes it difficult to predict the costs of oil-based products used in road construction such as liquid asphalt and gasoline. Oil prices began rising in early 2016 and have continued to fluctuate during 2017 and 2018. Fluctuations are expected to continue in the future. Minor fluctuations in oil prices should not have a significant impact on customers' buying decisions. Other factors such as political uncertainty in oil producing countries, interruptions in oil production due to disasters, whether natural or man-made, or other economic factors could significantly impact oil prices, which could negatively impact demand for the Company's products. The Company believes the continued funding of the FAST Act federal highway bill passed in

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

December 2015 has a greater potential to impact the buying decisions of the Company's customers than does the fluctuation of oil prices in 2019.

Contrary to the impact of oil prices on many of the Company's Infrastructure Group products as discussed above, the products manufactured by the Energy Group, which are used in drilling for oil and natural gas, in heaters for refineries and oil sands, and in double fluid pump trailers for fracking and oil and gas extraction, would benefit from higher oil and natural gas prices, to the extent that such higher prices lead to increased development in the oil and natural gas production industries. The Company believes further development of domestic oil and natural gas production capabilities is needed and would positively impact demand for the Company's oil and gas related products.

Steel is a major component in the Company's equipment. Steel prices rose significantly during the first half of 2018 and were impacted by the Section 232 and 301 tariffs enacted. Steel prices have stabilized at the elevated levels, and the Company anticipates prices to remain in this range for the first half of 2019. The Company continues to utilize forward-looking contracts (with no minimum or specified quantity guarantees) coupled with advanced steel purchases to minimize the impact of any price increases. The Company will continue to review the trends in steel prices in 2019 and establish future contract pricing accordingly.

In addition to the factors stated above, many of the Company's markets are highly competitive, and its products compete worldwide with a number of other manufacturers and dealers that produce and sell similar products. From 2010 through mid-2012, a weak U.S. dollar, combined with improving economic conditions in certain foreign economies, had a positive impact on the Company's international sales. The continued strengthened U.S. dollar since mid-2012 has negatively impacted pricing in certain foreign markets the Company serves. The Company expects the U.S. dollar to remain strong in the near term relative to most foreign currencies. Increasing domestic interest rates or weakening economic conditions abroad could cause the U.S. dollar to further strengthen, which could negatively impact the Company's international sales.

In the United States and internationally, the Company's equipment is marketed directly to customers as well as through dealers. During 2018, approximately 60% of the Company's sales were to the end user. The Company expects this ratio to be between 60% and 70% for 2019.

The Company is operated on a centrally led, but decentralized basis, with a complete operating management team for each operating subsidiary. Finance, insurance, legal, shareholder relations, corporate accounting and other corporate matters are primarily managed at the corporate level (i.e., Astec Industries, Inc., the parent company). The engineering, design, sales, manufacturing and basic accounting functions are the responsibility of each individual subsidiary. Standard accounting procedures are prescribed and followed in all reporting.

The Company's current profit sharing plans allow corporate officers, subsidiary presidents and other key management employees at each subsidiary the opportunity to earn profit sharing incentives based upon the Company's and/or the individual groups or subsidiaries' return on capital employed, EBITDA margin and safety. Corporate officers' and subsidiary presidents' awards, when calculated at targeted performance, are between 35% and 100% of their base salary, depending upon their responsibilities, and the plans allow for awards of up to 200% of target incentive compensation. Each subsidiary also has the opportunity to earn up to 10% of its after-tax profit as a profit-sharing incentive award to be paid to its employees.

The Company's current long-term incentive plans allow corporate officers, subsidiary presidents and other corporate or subsidiary management employees to be awarded Restricted Stock Units ("RSUs") if certain goals are met based upon the Company's Total Shareholder's Return ("TSR") as compared to a peer group and the Company's pretax profit margin. The grant date value of corporate officers' and subsidiary presidents' awards, when calculated at targeted performance, are between 20% and 100% of their base salary, depending upon their responsibilities, and the plans allow for awards of up to 200% of target incentive compensation. Additional RSUs may be granted to other key subsidiary management employees based upon individual subsidiary profits.

Beginning in 2018 and continuing through mid-2019, the Company retained the services of a specialized consulting firm to assist with the accumulation of company-wide purchasing data and a system for maintaining similar data in the future for management to utilize in negotiations with suppliers or potential suppliers in order to obtain reduced prices on raw materials and equipment components purchased. The firm is also assisting with the development of sales and operational planning procedures designed to achieve significant reductions in inventory levels maintained for normal production needs and to reduce existing excess inventories. The Company expects the results of these efforts to positively impact its gross margins and inventory levels in 2019 and the future.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Results of Operations: 2018 vs. 2017

Pellet Plant Agreement

The Company was party to a 2015 sales contract with the purchaser of a large wood pellet plant, on which \$143,300 of cumulative revenue had previously been recorded based on the over-time method. The contract contained certain production output and operational provisions, which if not timely met, could have resulted in the Company having to refund the purchase price to the customer. Additional contract provisions could have required the Company to compensate the customer for production shortfalls caused by the Company and other potential costs (depending on the market price of wood pellets). The plant did not meet the production output and operational specifications by the deadline set forth in the contract, and the Company subsequently entered into an agreement with the customer on July 20, 2018 whereby the Company agreed to pay the customer \$68,000 and to forgive \$7,315 in accounts receivable to obtain a full release of all the Company's contractual obligations under the sales contract. The terms of the pellet plant agreement resulted in the Company's Infrastructure Group recording reductions in sales of \$75,315 and gross margins of \$71,029 in 2018. The Company paid the scheduled \$68,000 during 2018. The pellet plant agreement also stipulates that the customer will pay the Company \$7,000 if the wood pellet plant's performance satisfies certain emissions targets prior to May 1, 2019.

Georgia Pellet Plant

The Company manufactured its first wood pellet plant for a customer under a Company-financed arrangement whereby the Company deferred the recognition of revenue as payment under the arrangement was not assured. The original customer is attempting to obtain financing to purchase the plant at a reduced price; however, the Company believes the ultimate consummation of the sale to this customer is uncertain. After considering the uncertainty of completing the sale to the existing customer; the lack of success in attempting to market the plant to other pellet plant operators; the cost of repossessing the plant; and the Company's decision to exit the pellet plant business line, the pellet plant inventory's net realizable value has been written down to zero, resulting in a charge to costs of sales of \$65,706 in the fourth quarter of 2018.

Net Realizable Value Inventory Adjustment

Inventories are valued at the lower of cost or net realizable value which requires the Company to make specific estimates, assumptions and professional judgement to determine if adjustments of inventories values to their net realizable value are necessary. In the fourth quarter of 2018, after an in-depth analysis of the age, quantities on hand, market acceptance of the equipment, management's inventory and working capital control objectives, and other related factors, it was determined that various specific equipment models of the Company's Energy Group inventories, primarily related to oil and gas equipment, required an adjustment of \$7,487 to cost of sales to reduce inventories to their net realizable values.

Liquidation of Subsidiary

While reviewing performance criteria against actual results of all Astec companies during a strategic planning meeting held by management in late 2018, it was determined that Astec Mobile Machinery GmbH ("AMM") did not meet the desired performance metrics. Documents were filed by the Company in the German court system in December 2018 to begin the process of liquidating AMM. The Company expects the liquidation of AMM to be completed in 2019. A restructuring charge of \$1,870 was recorded by the Infrastructure Group in December 2018 related to the liquidation of AMM.

Goodwill Impairment

The Company tests goodwill at least annually for impairment. Goodwill testing and valuation procedures were performed by the Company in the fourth quarter of 2018 using actual financial results and forecasts approved by the Company. The testing resulted in impairments at two of the businesses recently acquired by the Company, RexCon, Inc. and Power Flame Incorporated. As a result, the Energy Group recorded goodwill impairment of \$11,190 in the fourth quarter of 2018.

Net Sales

Net sales decreased \$13,140 or 1.1% to \$1,171,599 in 2018 from \$1,184,739 in 2017. Sales are generated primarily from new equipment purchases made by customers for use in construction of privately funded infrastructure, public sector spending on infrastructure and sales of equipment for the aggregate, mining, wood pellet, quarrying and recycling markets, and for oil and gas and geothermal industries. Excluding the \$75,315 one-time pellet plant sales reduction described above, total net sales increased \$62,175 between years.

Domestic sales for 2018 were \$915,814 or 78.2% of net sales compared to \$932,294 or 78.7% of net sales for 2017, a decrease of \$16,480 or 1.8%. The decrease in domestic sales was due to the one-time pellet plant charge described above. This sales decrease was offset by increased non-pellet related equipment sales of \$58,835 from 2017 to 2018 resulting from sales increases in most of the Company's Energy and Aggregate and Mining major product lines due to the continuing positive economic conditions in the domestic markets and the impact of the FAST Act funding.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

International sales for 2018 were \$255,785 or 21.8% of net sales compared to \$252,445 or 21.3% of net sales for 2017, an increase of \$3,340 or 1.3%. The Company experienced improved international sales for its aggregate and mining equipment during 2018 and decreased sales of infrastructure related equipment during 2018, while equipment sold by the Energy Group remained relatively flat between 2017 and 2018. Sales reported by the Company for 2018 would have been \$750 higher had 2018 foreign exchange rates been the same as 2017 rates. The increase in international sales occurred primarily in South America, Africa, Europe and the Middle East, offset by sales decline in Asia, Brazil, Russia, Canada and China. The Company continues its efforts to grow its international business by increasing its presence in the markets it serves and the opening of Company-owned distributors.

Parts sales for 2018 were \$308,703 or 26.3% of net sales compared to \$283,361 or 23.9% of net sales for 2017, an increase of \$25,342 or 8.9%. All of the Company's major product lines experienced increased parts sales in 2018 as compared to 2017.

Gross Profit

Gross profit for 2018 was \$135,766 or 11.6% of net sales as compared to \$243,129 or 20.5% of net sales in 2017, a decline of \$107,363 or 44.2%. The decrease in gross profit was primarily due to the pellet plant charges discussed above, which resulted in a decrease in gross margins of \$136,735. These decreases were offset by increases of \$29,372 in gross profit (non-pellet related) in all other product lines.

Selling, General and Administrative Expense

Selling, general and administrative expense for 2018 was \$180,795 or 15.4% of net sales compared to \$160,775 or 13.6% of net sales for 2017, an increase of \$20,020 or 12.5% primarily due to increases in payroll and related expense of \$10,005, consulting expense of \$7,032, commissions and travel expenses of \$6,745 and legal and professional fee expense of \$3,039, offset by a decrease in ConExpo expense of \$4,363.

Research and Development

Research and development expenses increased \$1,515 or 5.6% to \$28,332 in 2018 from \$26,817 in 2017. During 2018, the Company continued its focus on research and development spending for new products as well as improvements to existing product lines and adaptation of those products to other markets.

Impairment and Restructuring Charges

Impairment and restructuring charges total \$13,060 in 2018 and include a goodwill impairment charge of \$11,190 and a charge of \$1,870 related to the closing of the Company-owned distributor in Germany, which is expected to be completed in 2019.

Interest Expense

Interest expense in 2018 increased \$205 or 24.4% to \$1,045 from \$840 in 2017 due to an increase in debt levels of the Company in 2018.

Interest Income

Interest income decreased \$350 or 26.9% to \$952 in 2018 from \$1,302 in 2017 due primarily to a reduction in interest received in 2018 from a wood pellet plant customer compared to amounts received in 2017.

Other Income

Other income decreased \$682 or 56.0% to \$536 in 2018 from \$1,218 in 2017. The decrease in other income is primarily due to the reclassification of licensing fees to sales under new accounting guidance adopted in 2018.

Income Tax

Income tax benefit for 2018 was \$25,234, compared to income tax expense of \$19,627 for 2017. The effective tax rates for 2018 and 2017 were 29.3% and 34.3%, respectively. The Company's tax rates are affected by recurring items which are generally consistent from period to period, as well as discrete items that may occur in any given period but are not consistent from period to period. In addition to the federal tax rate reduction from 35% to 21% for tax years beginning in 2018 and state income tax expense or benefit items, the items having the most significant impact on the effective tax rate for 2018 include a benefit of \$4,660 for research and development tax credits, a benefit of \$1,403 for the liquidation of a foreign subsidiary, expense of \$978 for domestic and foreign valuation allowance changes and expense of \$1,856 related to unrecognized tax benefits for tax positions taken in 2018.

Net Income Attributable To Controlling Interest

The Company had a net loss attributable to controlling interest of \$60,449 in 2018 compared to net income of \$37,795 in 2017, a decrease of \$98,244. Earnings per diluted share decreased \$4.27 to a loss of \$2.64 in 2018 from income of \$1.63 in 2017. Weighted average diluted shares outstanding for the years ended December 31, 2018 decreased to 22,902 from 23,184 in 2017, due primarily to the Company repurchasing 582 shares of its common stock in late 2018 under the Company's stock buy-back program partially offset by stock incentive plan activity.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Backlog

The backlog of orders at December 31, 2018 was \$344,962 compared to \$411,469 at December 31, 2017, a decrease of \$66,507 or 16.2%. The decrease in the backlog of orders was due to a decrease in domestic backlog of \$75,161, including a \$60,249 reduction of pellet plant related backlog, partially offset by an increase in international backlog of \$8,654 or 11.5%. The Infrastructure Group backlog decreased \$90,058, including \$60,249 of pellet plant related backlog, or 37.6% from 2017. The Aggregate and Mining Group backlog increased \$13,704 or 11.7% from 2017, and the backlog in the Energy Group increased \$9,847 or 17.9% over the 2017 levels. The Company is unable to determine whether the changes in backlogs were experienced by the industry as a whole.

Net Sales by Segment

	2018	2017	\$ Change	% Change
Infrastructure Group	\$ 442,289	\$ 553,691	\$ (111,402)	(20.1)%
Aggregate and Mining Group	453,164	403,720	49,444	12.2%
Energy Group	276,146	227,328	48,818	21.5%

Infrastructure Group: Sales in this group decreased \$111,402 or 20.1%. Domestic sales for the Infrastructure Group decreased \$92,643 or 19.9% in 2018 compared to 2017. The decrease in domestic sales was due primarily to the one-time pellet plant sales reduction of \$75,315 discussed above. International sales for the Infrastructure Group decreased \$18,759 or 21.5% in 2018 compared to 2017. The decrease in international sales for the Infrastructure Group occurred mainly in Canada, Russia, the West Indies, Mexico and Post-Soviet States. Parts sales for the Infrastructure Group increased 4.5% in 2018 compared to 2017. The Company expects to introduce new asphalt plant models in 2019 that are designed to better meet the needs of the international market.

Aggregate and Mining Group: Sales in this group increased \$49,444 or 12.2%. Domestic sales for the Aggregate and Mining Group increased \$24,592 or 8.9% in 2018 compared to 2017 primarily due to improved sales into the Company's traditional rock quarry markets and increased sales of the Company's larger aggregate equipment. International sales for the Aggregate and Mining Group increased \$24,852 or 19.7% in 2018 compared to 2017. The increase in international sales is due to increased sales by the Company's Northern Ireland subsidiary due to an improved mix of project machines compared to highly customized equipment, and the Company's continued sales efforts in the international markets. The increase in international sales for the Aggregate and Mining Group occurred primarily in South America, Africa, Europe, the Middle East, Mexico and Russia and was offset by sales declines in Asia, Brazil, Post-Soviet States, Japan and China. Parts sales for the Aggregate and Mining Group increased 12.1% in 2018 compared to 2017 due to an increase in parts packages sold with equipment orders, improved sales by the Company's South African subsidiary and sales into the traditional rock quarry markets.

Energy Group: Sales in this group increased \$48,818 or 21.5%. Domestic sales for the Energy Group increased \$51,571 or 27.4% in 2018 compared to 2017 due to an increase in RexCon (acquired in October 2017) concrete plant sales of \$31,200 compared to 2017 and improved sales of oil and gas pumpers, industrial heaters and related equipment. International sales for the Energy Group decreased \$2,753 or 7.0% in 2018 compared to 2017. The decrease in international sales was due primarily to decreased sales of oil and gas drilling rigs. The decrease in international sales occurred in Australia, China, Brazil and the Middle East and was offset by increased sales in Canada and South America (excluding Brazil). Parts sales for the Energy Group increased 14.8% in 2018 compared to 2017 due to increased sales in all major product lines.

Segment Profit (Loss)

	2018	2017	\$ Change	% Change
Infrastructure Group	\$ (112,954)	\$ 26,641	\$ (139,595)	(524.0)%
Aggregate and Mining Group	45,464	35,748	9,716	27.2%
Energy Group	3,070	16,219	(13,149)	(81.1)%
Corporate	1,586	(40,963)	42,549	103.9%

Infrastructure Group: Profit for this group decreased \$139,595 from 2017. This group's profits were impacted by a decrease in gross profit of \$130,384 (including a decrease in gross margins of \$136,735 due primarily to the pellet plant charges discussed above).

Aggregate and Mining Group: Profit for this group increased \$9,716 or 27.2% from 2017. This group's profits were impacted by an increase in gross profit of \$19,180 on increased sales of \$49,444 and by a 170 basis point increase in gross margin due to product mix considerations and increased margins at the Company's Canadian, South African and certain domestic subsidiaries.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Energy Group: Profit for this group decreased \$13,149 or 81.1% from 2017. This group's profits were impacted by a 290 basis point decrease in gross margins (due partially to the \$7,487 net realizable value adjustments discussed above), which was offset by an increase of \$3,977 in gross margin dollars on an increase in sales of \$48,818. The group's profits were negatively impacted by a \$17,335 increase in selling, general and administrative expenses, of which \$11,190 relates to goodwill impairments recorded by Power Flame and RexCon, which were acquired in 2016 and 2017, respectively.

Corporate: Net corporate expenses decreased \$42,549 from 2017, primarily due to decreased income taxes of \$46,125 offset by increased repairs and maintenance of \$2,225 (primarily a major plane engine overhaul) and increased accounting fees of \$1,413.

Results of Operations: 2017 vs. 2016

Net Sales

Net sales increased \$37,308 or 3.3% to \$1,184,739 in 2017 from \$1,147,431 in 2016. Sales are generated primarily from new equipment purchases made by customers for use in construction of privately funded infrastructure, public sector spending on infrastructure and sales of equipment for the aggregate, mining, wood pellet, quarrying and recycling markets, and for oil and gas and geothermal industries. Excluding a decline in domestic wood pellet plant sales discussed below, total sales increased \$164,508 between years.

Domestic sales for 2017 were \$932,294 or 78.7% of net sales compared to \$941,273 or 82.0% of net sales for 2016, a decrease of \$8,979 or 1.0%. The decrease in domestic sales was due to a \$127,200 decline in pellet plant related sales due to no new orders being received in 2017, offset by increases in sales of most of the Company's other major product lines due to the continuing positive economic conditions in the domestic markets and the impact of the FAST Act funding.

International sales for 2017 were \$252,445 or 21.3% of net sales compared to \$206,158 or 18.0% of net sales for 2016, an increase of \$46,287 or 22.5%. The Company experienced improved markets for most of its major product lines internationally in 2017 compared to 2016 caused by improved global market conditions, the stabilization of the U.S. dollar in certain foreign markets and a slight recovery in the mining and oil and gas sectors. The Company believes its strategy of keeping its sales and service structure in place during the recent downturn aided international sales in 2017. Sales reported by the Company for 2017 would have been \$2,884 lower had 2017 foreign exchange rates been the same as 2016 rates. The increase in international sales occurred primarily in Canada, Russia, Australia, Brazil and Africa, offset by sales decline in South America (excluding Brazil), Japan and Mexico. The Company continues its efforts to grow its international business by increasing its presence in the markets it serves.

Parts sales for 2017 were \$283,361 or 23.9% of net sales compared to \$263,457 or 23.0% of net sales for 2016, an increase of \$19,904 or 7.6%. All of the Company's major product lines experienced increased parts sales in 2017 as compared to 2016.

Gross Profit

Gross profit for 2017 was \$243,129 or 20.5% of net sales as compared to \$265,269 or 23.1% of net sales in 2016, a decline of \$22,140 or 8.3%. Due to cost overruns incurred in 2017 by the Company on the installation phase of its customer's Arkansas wood pellet plant sold in 2016 and the identification of design issues its customers' wood pellet plants in Arkansas and Georgia discovered in the third quarter of 2017, the Company experienced an overall reduction in wood pellet plant margins of \$60,107 between years. As the Company financed the sale of the \$60,249 Georgia wood pellet plant, no revenue from the sale has been recorded.

Selling, General and Administrative Expense

Selling, general and administrative expense for 2017 was \$160,775 or 13.6% of net sales compared to \$153,145 or 13.3% of net sales for 2016, an increase of \$7,630 or 5.0%, due to an increase of \$8,646 in selling expenses resulting primarily from increased ConExpo Show-related costs of \$4,355 and other increased costs related to the \$164,508 increase in total sales excluding wood pellet plants.

Research and Development

Research and development expenses increased \$1,848 or 7.4% to \$26,817 in 2017 from \$24,969 in 2016. During 2017, the Company continued its focus on research and development spending for new products as well as improvements to existing product lines and adaptation of those products to other markets.

Interest Expense

Interest expense in 2017 decreased \$555 or 39.8%, to \$840 from \$1,395 in 2016 due to a reduction in debt levels at the Company's subsidiary in Brazil and reduced interest on tax return audit assessments.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Interest Income

Interest income increased \$496 or 61.5% to \$1,302 in 2017 from \$806 in 2016 due primarily to interest received in 2017 from a wood pellet plant customer.

Other Income

Other income increased \$689 or 130.2% to \$1,218 in 2017 from \$529 in 2016 due primarily to a \$347 deposit forfeited by a customer on a cancelled order, reduced investment losses of \$180 and improved licensing fee income of \$105.

Income Tax

Income tax expense for 2017 was \$19,627, compared to \$32,107 for 2016. The effective tax rates for 2017 and 2016 were 34.3% and 36.9%, respectively. The reduction in tax rates between periods is due primarily to an increase in the percent impact of the Company's Domestic Production Activities Deduction and Research and Development Tax Credit (due to similar dollar impacts on lower taxable earnings) and a \$1,056 reduction in income tax expense in the fourth quarter of 2017 due to the application of the provisions of Tax Cuts and Jobs Act of 2017, enacted by the U.S. government on December 22, 2017.

Net Income Attributable To Controlling Interest

The Company had net income attributable to controlling interest of \$37,795 in 2017 compared to \$55,159 in 2016, a decrease of \$17,364, or 31.5%. Earnings per diluted share decreased \$0.75 to \$1.63 in 2017 from \$2.38 in 2016. Weighted average diluted shares outstanding for the years ended December 31, 2017 and 2016 were 23,184 and 23,142, respectively.

Backlog

The backlog of orders at December 31, 2017 was \$411,469 compared to \$361,831 at December 31, 2016, an increase of \$49,638, or 13.7%. Backlogs for both periods include a \$60,249 pellet plant order the Company which was later cancelled in mid-2018. The increase in the backlog of orders was due to an increase in domestic backlog of \$36,786 or 12.3% and an increase in international backlog of \$12,852 or 20.5%. The Infrastructure Group backlog increased \$7,271 or 3.1% from 2016. The Aggregate and Mining Group backlog increased \$28,036 or 31.5% from 2016 while the backlog in the Energy Group increased \$14,331 or 35.2% over the 2016 levels. The Company is unable to determine whether the changes in backlogs were experienced by the industry as a whole.

Net Sales by Segment

	2017	2016	\$ Change	% Change
Infrastructure Group	\$ 553,691	\$ 608,908	\$ (55,217)	(9.1)%
Aggregate and Mining Group	403,720	359,760	43,960	12.2%
Energy Group	227,328	178,763	48,565	27.2%

Infrastructure Group: Sales in this group decreased \$55,217 or 9.1%. Excluding a \$127,200 decrease in wood pellet plant sales, the group's sales increased \$71,983 in 2017 as compared to 2016. Domestic sales for the Infrastructure Group decreased \$80,666 or 14.7% in 2017 compared to 2016. The decrease in domestic sales was due to a \$127,200 decline in pellet plant related sales due to no new orders being received in 2017, offset by increases in sales of most other major product lines due to the continuing positive economic conditions in the domestic markets and the impact of the FAST Act funding. International sales for the Infrastructure Group increased \$25,449 or 41.3% in 2017 compared to 2016. The increase in international sales was due primarily to the improved sales of mobile asphalt equipment and increased sales by the Company owned distributor in Australia. The increase in international sales for the Infrastructure Group occurred mainly in Canada, Australia and Russia, offset by a decrease in sales in South America and Japan. Parts sales for the Infrastructure Group increased 3.7% in 2017 compared to 2016.

Aggregate and Mining Group: Sales in this group increased \$43,960 or 12.2%. Domestic sales for the Aggregate and Mining Group increased \$32,206 or 13.1% in 2017 compared to 2016 primarily due to improved sales into the Company's traditional rock quarry markets, increased sales of the Company's larger aggregate equipment due to the release of pent-up demand and increased sales by the Company's Northern Ireland subsidiary in the U.S. domestic market. International sales for the Aggregate and Mining Group increased \$11,754 or 10.3% in 2017 compared to 2016. The increase in international sales is due to an easing of pent-up demand, the Company's continued sales efforts in the international markets and improved sales by the Company's Brazilian subsidiary. The increase in international sales for the Aggregate and Mining Group occurred primarily in Canada, Brazil, Australia, Asia and Africa, offset by sales declines in Mexico, Japan and South America. Parts sales for the Aggregate and Mining Group increased 7.9% in 2017 compared to 2016 due to improved sales by the Company's South African subsidiary and sales into the traditional rock quarry markets.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Energy Group: Sales in this group increased \$48,565 or 27.2%. Domestic sales for the Energy Group increased \$39,482 or 26.6% in 2017 compared to 2016 due to an increase in sales of \$14,739 by Power Flame, which was acquired on August 1, 2016, and improved sales of wood chipping and grinding equipment, drilling rigs and oil and gas pumpers. RexCon, Inc., which was acquired on October 1, 2017, also contributed \$2,449 of domestic sales in 2017. International sales for the Energy Group increased \$9,083 or 30.0% in 2017 compared to 2016. The increase in international sales was due primarily to increased sales by Power Flame of \$3,287 and increased sales of oil and gas drilling rigs. The increase in international sales occurred in Canada, Africa, China, Brazil and the Middle East, offset by decreased sales in South America (excluding Brazil). Parts sales for the Energy Group increased 19.6% in 2017 compared to 2016 due to increased sales in all major product lines.

Segment Profit (Loss)

	2017	2016	\$ Change	% Change
Infrastructure Group	\$ 26,641	\$ 71,482	\$ (44,841)	(62.7)%
Aggregate and Mining Group	35,748	34,877	871	2.5%
Energy Group	16,219	4,145	12,074	291.3%
Corporate	(40,963)	(55,992)	15,029	26.8%

Infrastructure Group: Profit for this group decreased \$44,841 or 62.7% from 2016. This group's profits were impacted by a decrease in gross profit of \$42,821 or 550 basis points. The Company experienced an overall reduction in wood pellet plant margins of \$60,107 between years due to cost overruns incurred by the Company in 2017 on the installation phase of its customer's Arkansas wood pellet plant sold in 2016 and the identification of design issues its customers' wood pellet plants in Arkansas and Georgia discovered in the third quarter of 2017. As the Company financed the original sale of the Georgia wood pellet plant, no revenue from the sale has been recorded. Segment profits were also negatively impacted by a \$3,448 increase in selling expenses, including \$1,986 related to the ConExpo Show and other cost increases related to the \$71,983 increase in group sales, excluding wood pellet plants. Research and development costs also increased by \$1,475 between periods.

Aggregate and Mining Group: Profit for this group increased \$871 or 2.5% from 2016. This group's profits were impacted by an increase in gross profit of \$2,440 on increased sales of \$43,960, offset by a 220 basis point decrease in gross margin due to intercompany profit eliminations, product mix considerations and reduced margins at the Company's Northern Ireland subsidiary. The group's profits were also negatively impacted by increased ConExpo Show costs of \$1,842.

Energy Group: Profit for this group increased \$12,074 or 291.3% from 2016. This group's profits were impacted by an increase in gross profit of \$17,954 on increased sales of \$48,565 and a 330 basis point increase in gross margins. Margins were favorably impacted by significant improvements at the Company's GEFCO subsidiary, due to a 64% increase in sales, and by the addition of Power Flame, which was acquired on August 1, 2016. The group's profits were negatively impacted by a \$5,540 increase in selling, general and administrative expenses, of which \$3,280 relates to additional costs incurred by Power Flame and RexCon, which were acquired in 2016 and 2017, respectively.

Corporate: Net corporate expenses decreased \$15,029 from 2016 due to decreases in profit sharing and SERP expenses of \$5,031 and decreased income taxes of \$10,617.

Liquidity and Capital Resources

The Company's primary sources of liquidity and capital resources are its cash on hand, borrowing capacity under a \$100,000 revolving credit facility with a lender and cash flows from operations. The Company had \$25,821 (of which \$21,933 was held by our foreign subsidiaries) of cash available for operating purposes at December 31, 2018. The Company had borrowings of \$58,778 and outstanding letters of credit of \$11,044 resulting in additional borrowing availability of \$30,178 under the credit facility as of December 31, 2018. Borrowings under the Company's credit agreement are subject to an interest rate equal to the daily one-month LIBOR rate plus a 0.75% margin, resulting in a rate of 3.27% at December 31, 2018. The credit agreement contains certain financial covenants, including provisions concerning required levels of annual net income, minimum tangible net worth and maximum allowed capital expenditures. The Company was in compliance with these covenants as of December 31, 2018.

In February 2019, the \$100,000 amended and restated credit agreement discussed above was again amended to increase the unsecured line of credit to a maximum of \$150,000 and to extend the maturity date of the agreement to December 29, 2023. Upon disposition of the Georgia wood pellet plant, the Company is required to apply the proceeds, if any, as a payment against any outstanding balance on the line of credit. Other significant terms were left unchanged.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

The Company's South African subsidiary, Osborn Engineered Products SA (Pty) Ltd ("Osborn"), has a credit facility of \$6,600 with a South African bank to finance short-term working capital needs, as well as to cover performance letters of credit, advance payment and retention guarantees. As of December 31, 2018, Osborn had no outstanding borrowings, but had \$397 in performance, advance payment and retention guarantees outstanding under the facility. The facility has been guaranteed by Astec Industries, Inc., but is otherwise unsecured. A 0.75% unused facility fee is charged if less than 50% of the facility is utilized. As of December 31, 2018, Osborn had available credit under the facility of \$6,203. The interest rate is 0.25% less than the South Africa prime rate, resulting in a rate of 10.0% as of December 31, 2018.

The Company's Brazilian subsidiary, Astec do Brasil Fabricacao de Equipamentos Ltda. ("Astec Brazil"), has outstanding working capital loans totaling \$1,207 from Brazilian banks with interest rates ranging from 10.4% to 11.0%. The loans' maturity dates range from January 2019 to April 2024 and are secured by Astec Brazil's manufacturing facility and also by letters of credit totaling \$3,200 issued by Astec Industries, Inc. Additionally, Astec Brazil has various 5-year equipment financing loans outstanding with Brazilian banks in the aggregate of \$137 as of December 31, 2018 that have interest rates ranging from 3.5% to 16.3%. These equipment loans have maturity dates ranging from January 2019 to April 2020.

Cash Flows from Operating Activities

	2018	2017	Increase / Decrease
Net income (loss)	\$ (60,744)	\$ 37,590	\$ (98,334)
Depreciation and amortization	27,913	25,802	2,111
Provision for warranties	13,219	16,725	(3,506)
Deferred income tax benefits	(25,385)	(291)	(25,094)
Restructuring and asset impairment charges	13,060	--	13,060
Increase in receivables	(16,189)	(7,749)	(8,440)
(Increase) decrease in inventories	30,757	(19,618)	50,375
Increase in prepaid expenses	(11,943)	(5,181)	(6,762)
Increase in accounts payable	9,843	630	9,213
Increase (decrease) in customer deposits	(522)	9,379	(9,901)
Decrease in accrued product warranties	(17,539)	(14,642)	(2,897)
Other, net	7,745	(764)	8,509
Net cash provided (used) by operating activities	\$ (29,785)	\$ 41,881	\$ (71,666)

Net cash provided by operating activities decreased \$71,666 in 2018 compared to 2017. The primary reason for the decrease in operating cash flows relates to the payment of a \$68,000 settlement agreement with a pellet plant customer in 2018.

Cash Flows from Investing Activities

	2018	2017	Increase / Decrease
Expenditures for property and equipment	\$ (27,440)	\$ (20,046)	\$ (7,394)
Business acquisition, net of cash acquired	--	(26,443)	26,443
Other	15	(411)	426
Net cash used by investing activities	\$ (27,425)	\$ (46,900)	\$ 19,475

Net cash used by investing activities decreased by \$19,475 in 2018 compared to 2017 due primarily to the reductions in cash expenditures for business acquisitions offset by an increase in expenditures for property and equipment.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Cash Flows from Financing Activities

	2018	2017	Increase / Decrease
Payment of dividends	\$ (9,625)	\$ (9,226)	\$ (399)
Borrowings under bank loans	148,504	--	148,504
Repayments of bank loans	(91,964)	(7,242)	(84,722)
Repurchase of Company stock	(24,138)	--	(24,138)
Other, net	(83)	(324)	241
Net cash provided (used) by financing activities	\$ 22,694	\$ (16,792)	\$ 39,486

Financing activities provided cash of \$22,694 in 2018 and used cash of \$16,792 in 2017, resulting in a total increase between periods of \$39,486. The change is primarily due to an increase of \$58,778 in borrowings under the Company's \$100,000 line of credit and \$24,138 expended under the Company's stock buy-back program.

Approved capital expenditures for 2019 total \$39,477. Capital expenditures are for various purchases of machinery and equipment, automobiles and technology to meet the needs across all Company subsidiaries. The Company expects to finance these expenditures using currently available cash balances, internally generated funds and available credit under the Company's credit facility.

Financial Condition

The Company's current assets decreased to \$560,991 at December 31, 2018 from \$602,969 at December 31, 2017, a decrease of \$41,978. The decrease is due to decreases in cash and cash equivalents of \$36,459 and inventories of \$35,435, offset by increases in trade receivables of \$15,783. Additionally, accounts receivable days outstanding increased from 34.3 in 2017 to 38.2 in 2018.

The Company's current liabilities increased to \$189,231 at December 31, 2018 from \$179,146 at December 31, 2017, an increase of \$10,085. The increase is primarily due to increases in accounts payable of \$10,197.

Market Risk and Risk Management Policies

The Company is exposed to changes in interest rates, primarily from its revolving credit agreements. A hypothetical 100 basis point adverse move (increase) would increase interest expense by approximately \$600 annually if current debt levels are maintained. The Company does not hedge variable interest.

The Company is subject to foreign exchange risk at its foreign operations. Foreign operations represent 16.1% and 15.9% of total assets at December 31, 2018 and 2017, respectively, and 11.6% and 10.8% of total net sales for the years ended December 31, 2018 and 2017, respectively. Each period, the balance sheets and related results of operations of the Company's foreign subsidiaries are translated from their functional foreign currency into U.S. dollars for reporting purposes. As the U.S. dollar strengthens against those foreign currencies, the foreign denominated net assets and operating results become less valuable in the Company's reporting currency. When the U.S. dollar weakens against those currencies, the foreign denominated net assets and operating results become more valuable in the Company's reporting currency. At each reporting date, the fluctuation in the value of the net assets and operating results due to foreign exchange rate changes is recorded as an adjustment to other comprehensive income (loss) in equity. The Company views its investments in foreign subsidiaries as long-term and does not hedge the net investments in foreign subsidiaries.

From time to time, the Company's foreign subsidiaries enter into transactions not denominated in their functional currency. In these situations, the Company evaluates the need to hedge those transactions against foreign currency rate fluctuations. When the Company determines a need to hedge a transaction, the subsidiary enters into a foreign currency exchange contract. The Company does not apply hedge accounting to these contracts and, therefore, recognizes the fair value of these contracts in the consolidated balance sheets and the change in the fair value of the contracts in current earnings.

Due to the limited exposure to foreign exchange rate risk, a 10% fluctuation in the foreign exchange rates at December 31, 2018 or 2017 would not have a material impact on the Company's consolidated financial statements.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Contractual Obligations

Contractual obligations and the period in which payments are due as of December 31, 2018 are as follows:

Contractual Obligations	Payments Due by Period				
	Total	Less Than 1 Year	Years 2 to 3	Years 4 to 5	More Than 5 Years
Operating lease obligations	\$ 3,702	\$ 1,992	\$ 1,488	\$ 210	\$ 12
Inventory purchase obligations	5,453	5,359	87	6	1
Debt obligations	60,122	413	431	59,206	72
Interest on debt obligations	6,303	1,922	3,844	537	--
Total	\$ 75,580	\$ 9,686	\$ 5,850	\$ 59,959	\$ 85

The above table excludes the Company's liability for unrecognized tax benefits, which totaled \$2,048 at December 31, 2018, since the timing of cash settlements to the respective taxing authorities cannot be reliably predicted. Interest obligations represent interest on the Company's line of credit outstanding at December 31, 2018 assuming the interest rate remained constant until the maturity date of the loan. Interest on debt in Brazil was ignored due to its immateriality.

In 2018 and 2017, the Company made contributions of approximately \$1,376 and \$415, respectively, to its pension plan. Currently, the Company has not planned any contributions to the pension plan in 2019. The Company's funding policy is to make at least the minimum annual contributions required by applicable regulations.

Contingencies

Management has reviewed all claims and lawsuits and has made adequate provision for any losses that can be reasonably estimated. Based upon currently available information and with the advice of counsel, management believes that the ultimate outcome of its current claims and legal proceedings, individually and in the aggregate, will not have a material adverse effect on the Company's financial position, cash flows or results of operations. However, claims and legal proceedings are subject to inherent uncertainties and rulings unfavorable to the Company could occur. If an unfavorable ruling were to occur, there exists the possibility of a material adverse effect on the Company's financial position, cash flows or results of operations.

Certain customers have financed purchases of the Company's products through arrangements in which the Company is contingently liable for customer debt in the aggregate amount of \$2,247 at December 31, 2018. These obligations have average remaining terms of 1.6 years. The Company has recorded a liability of \$1,183 related to these guarantees at December 31, 2018.

The Company is contingently liable under letters of credit of approximately \$11,044, primarily for performance guarantees to customers, banks or insurance carriers, including \$3,200 of letters of credit guaranteeing certain Astec Brazil bank debt. The outstanding letters of credit expire at various dates through October 2020. As of December 31, 2018, the Company's foreign subsidiaries are contingently liable for a total of \$2,016 in performance letters of credit, advance payments and retention guarantees. The maximum potential amount of future payments under these letters of credit and guarantees for which the Company could be liable is \$13,060 as of December 31, 2018.

The Company manufactured its first wood pellet plant for a customer under a Company-financed arrangement whereby the Company deferred the recognition of revenue as payment under the arrangement was not assured. The original customer is attempting to obtain financing to purchase the plant at a reduced price; however, the Company believes the ultimate consummation of the sale to this customer is uncertain. After considering the uncertainty of completing the sale to the existing customer; the lack of success in attempting to market the plant to other pellet plant operators; the cost of repossessing the plant; and the Company's decision to exit the pellet plant business line, the pellet plant inventory's net realizable value has been written down to zero.

The Company and certain of its current and former executive officers have been named as defendants in a putative shareholder class action lawsuit filed on February 1, 2019, in the United States District Court for the Eastern District of Tennessee. The action is styled City of Taylor General Employees Retirement System v. Astec Industries, Inc., et al., Case No. 1:19-cv-00024-PLR-CHS. The complaint generally alleges that the defendants violated the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Rule 10b-5 promulgated thereunder by making allegedly false and misleading statements and that the individual defendants are control person under Section 20(a) of the Exchange Act. The complaint was filed on behalf of shareholders who purchased shares of the Company's stock between July 26, 2016 and October 22, 2018 and seeks monetary damages on behalf of the purported class.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

We dispute these allegations and intend to defend this lawsuit vigorously. The Company is unable to estimate the possible loss or range of loss at this time.

Off-balance Sheet Arrangements

As of December 31, 2018, the Company does not have off-balance sheet arrangements as defined by Item 303(a)(4) of Regulation S-K.

Critical Accounting Policies and Estimates

The Company's consolidated financial statements are prepared in accordance with U.S. generally accepted accounting principles. Application of these principles requires the Company to make estimates and judgments that affect the amounts as reported in the consolidated financial statements. Accounting policies that are critical to aid in understanding and evaluating the results of operations and financial position of the Company include the following:

Inventory Valuation: Inventories are valued at the lower of first-in first-out cost or net realizable value. The most significant component of the Company's inventories is steel. Open market prices (including tariffs recently enacted) are subject to volatility and determine the cost of steel for the Company. During periods when open market prices decline, the Company may need to reduce the carrying value of the inventory. In addition, certain items in inventory become obsolete over time, and the Company reduces the carrying value of these items to their net realizable value. These reductions are determined by the Company based on estimates, assumptions and judgments made from the information available at that time. See Note 1, Summary of Significant Accounting Policies, of the Notes to Consolidated Financial Statements included in this Annual Report, for a description of the process used by the Company to value inventories at the lower of first-in first-out cost or market. The Company does not believe it is reasonably likely that the inventory values will materially change in the near future.

Revenue Recognition: Revenue is generally recognized on sales at the point in time when persuasive evidence of an arrangement exists, the price is fixed or determinable, the product has been delivered or services have been rendered and there is reasonable assurance of collection of the sales proceeds. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring goods or providing services. The Company generally obtains purchase authorizations from its customers for a specified amount of product at a specified price with specified delivery terms. A significant portion of the Company's equipment sales represents equipment produced in the Company's plants under short-term contracts for a specific customer project or equipment designed to meet a customer's specific requirements. Most of the equipment sold by the Company is based on standard configurations, some of which are modified to meet customer needs or specifications. The Company provides customers with technical design and performance specifications and performs pre-shipment testing to ensure the equipment performs according to design specifications, regardless of whether the Company provides installation services in addition to selling the equipment. Significant down payments are required on many equipment orders with other terms allowing for payment shortly after shipment, typically 30 days. Taxes assessed by a governmental authority that are directly imposed on revenue-producing transactions between the Company and its customers, such as sales, use, value-added and some excise taxes, are excluded from revenue. Expected warranty costs for our standard warranties are expensed at the time the related revenue is recognized. Costs of obtaining sales contracts with an expected duration of one year or less are expensed as incurred. As contracts are typically fulfilled within one year from the date of the contract, revenue adjustments for a potential financing component or the costs to obtain the contract are not made. Other contract assets are not material.

Depending on the terms of the arrangement with the customer, recognition of a portion of the consideration received may be deferred and recorded as a contract liability if we have to satisfy a future obligation, such as to provide installation assistance, service work to be performed in the future without charge, floor plan interest to be reimbursed to our dealer customers, payments for extended warranties, for annual rebates given to certain high volume customers or for obligations for future estimated returns to be allowed based upon historical trends.

Certain contracts include terms and conditions through which the Company recognizes revenues upon completion of equipment production, which is subsequently stored at the Company's plant at the customer's request. Revenue is recorded on such contracts upon the customer's assumption of title and transfer of control and when collectability is reasonably assured. In addition, there must be a fixed schedule of delivery of the goods consistent with the customer's business practices, the Company must not have retained any specific performance obligations such that the earnings process is not complete and the goods must have been segregated from the Company's inventory prior to revenue recognition.

The Company has certain sales containing multiple performance obligations, whereby revenue attributable to the sale of a product is recognized when the product is shipped, and the revenue attributable to services provided with respect to the product (such as installation services) is recognized when the service is performed. Consideration is allocated to deliverables using observable market prices from stand-alone performance obligations or a cost plus margin

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

approach when one is not available. Otherwise, the Company uses third-party evidence of selling price or the Company's best estimate of the selling price for the deliverables. The Company evaluates sales with multiple performance obligations to determine whether revenue related to individual elements should be recognized separately, or as a combined unit. In addition to the previously mentioned general revenue recognition criteria, the Company only recognizes revenue on individual delivered elements when there is objective and reliable evidence that the delivered element has a determinable value to the customer on a standalone basis and there is no right of return.

Goodwill and Other Intangible Assets: Intangible assets are classified into two categories: (1) intangible assets with definite lives subject to amortization, and (2) goodwill. Intangible assets with definite lives are tested for impairment if conditions exist that indicate the carrying value may not be recoverable. Risk factors that may be considered include an economic downturn in the general economy, a geographic market or the commercial and residential construction industries, a change in the assessment of future operations as well as the cyclical nature of our industry and the customization of the equipment we sell, each of which may cause adverse fluctuations in operating results. Other risk factors considered would be an increase in the price or a decrease in the availability of oil that could reduce the demand for our products in addition to the significant fluctuations in the purchase price of raw materials that could have a negative impact on the cost of production and gross margins as well as others more fully described in the Risk Factors section of our Form 10-K. An impairment charge is recorded when the carrying value of the definite lived intangible asset is not recoverable by the cash flows generated from the use of the asset. Some of the inputs used in the impairment testing are highly subjective and are affected by changes in business factors and other conditions. Changes in any of the inputs could have an effect on future tests and result in impairment charges.

Goodwill is not amortized but is tested for impairment annually or more frequently if events or circumstances indicate that such intangible assets or goodwill might be impaired. See Note 1, Summary of Significant Accounting Policies, of the Notes to Consolidated Financial Statements included in this Annual Report, for a description of testing performed by the Company to determine if the recorded value of intangible assets or goodwill has been impaired. See Note 5, Goodwill, of the Notes to Consolidated Financial Statements included in this Annual Report for a detail of goodwill by segment and impairment charges recorded in 2018.

The useful lives of identifiable intangible assets are determined after considering the specific facts and circumstances related to each intangible asset. Factors considered when determining useful lives include the contractual term of any agreement, the history of the asset, the Company's long-term strategy for the use of the asset, any laws or other local regulations which could impact the useful life of the asset, and other economic factors, including competition and specific market conditions. Intangible assets that are deemed to have definite lives are amortized, generally on a straight-line basis, over their useful lives, ranging from 5 to 19 years.

Income Taxes: The Company accounts for income taxes under the guidance of FASB Accounting Standards Codification Topic 740-10, "Income Taxes". Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. 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 be recovered or settled. A valuation allowance, which represents a reserve on deferred tax assets for which utilization is not more likely than not, is recorded. Judgment is required in determining the provision for income taxes, deferred tax assets and liabilities and the valuation allowance recorded against net deferred tax assets. Income tax contingency accruals are determined and recorded under the guidance of ASC Topic 740-10. Liabilities for uncertain income tax positions are based on a two-step process. The first step is to evaluate the tax position for recognition by determining if the weight of available evidence indicates that it is more likely than not that the position will be sustained on audit, including resolution of related appeals or litigation processes, if any. The second step requires an estimate and measurement of the tax benefit as the largest amount that is more than 50% likely to be realized upon ultimate settlement. It is inherently difficult and subjective to estimate such amounts, as the Company must determine the probability of various possible outcomes. We reevaluate these uncertain tax positions on a quarterly basis or when new information becomes available. These reevaluations are based on factors including, but not limited to, changes in facts or circumstances, changes in tax law, successfully settled issues under audit, expirations due to statutes, and new audit activity. Such a change in recognition or measurement could result in the recognition of a tax benefit or an increase to accrued taxes.

U.S. Tax Reform: On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "Tax Act") was signed into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a federal corporate tax rate decrease from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. The Company's fourth quarter 2017 provision for income taxes was reduced by \$1,056, (comprised of a \$1,548 reduction in income tax expense recorded in connection with the remeasurement of deferred tax assets and liabilities and \$492 of additional income tax expense recorded in

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

connection with the transition tax on the mandatory deemed repatriation of foreign earnings) due to applying the provisions of the Tax Act.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2014-09, "Revenue from Contracts with Customers", which supersedes existing revenue guidance under U.S. GAAP. The standard's core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. Certain provisions of the standard were clarified in March 2016 with the issuance of ASU No. 2016-08, "Revenue from Contracts with Customers (Topic 606)", which provided additional implementation guidance in order to eliminate the potential for diversity in practice arising from inconsistent application of the principal versus agent guidance. Under the new guidance, when an entity determines it is a principal in a transaction, the entity recognizes revenue in the gross amount of consideration; however, in transactions where an entity determines it is an agent, the entity recognizes revenue in the amount of any fee or commission to which it expects to be entitled. These new standards require companies to use more judgment and to make more estimates than under previous guidance and expand required disclosures to include information regarding contract assets and liabilities as well as a more disaggregated view of revenue. The standards are effective for public companies for annual periods beginning after December 15, 2017 and, as such, the Company adopted the new standards effective January 1, 2018, using the modified retrospective transition method. See Note 17, Revenue Recognition, of the Notes to Consolidated Financial Statements included in this Annual Report, for additional disclosures required by the standards. The adoption of the standards did not have a material impact on the Company's financial position, results of operations or cash flows, and no cumulative effect adjustment to retained earnings was necessitated.

In January 2016, the FASB issued ASU No. 2016-01, "Financial Instruments - Overall (Subtopic 825-10)", which requires, among other things, equity investments with readily determinable fair values, except those accounted for under the equity method of accounting or those that result in consolidation of the investee, to be measured at fair value with changes in fair value recognized in net income. The new standard was further clarified by the issuance of ASU No. 2018-03, "Technical Corrections and Improvements to Financial Instruments – Overall (Subtopic 825-10), Recognition and Measurement of Financial Assets and Financial Liabilities" in February 2018. The standards are effective for public companies in fiscal years beginning after December 15, 2017, and the Company adopted the standard effective January 1, 2018. The adoption of these standards did not have a material impact on the Company's financial position, results of operations or cash flows.

In February 2016, the FASB issued ASU No. 2016-02, "Leases (Topic 842)", which significantly changes the accounting for operating leases by lessees. The accounting applied by lessors is largely unchanged from that applied under previous guidance. The new guidance establishes a right-of-use ("ROU") model and requires lessees to recognize lease assets and lease liabilities in the balance sheet, initially measured at the present value of the lease payments, for leases which were classified as operating leases under previous guidance. Lease cost included in the statement of operations will be calculated so that the cost of the lease is allocated over the lease term, generally on a straight-line basis. The Company has made an accounting policy election to exclude leases with a term of 12 months or less from the requirement to record related assets and liabilities. Certain provisions of ASU No. 2016-02 were later modified or clarified by the issuance of ASU 2018-11, "Leases (Topic 842): Targeted Improvements" and ASU 2018-10, "Codification Improvements to Topic 842, Leases". A modified retrospective transition approach is required by the ASU and its provisions must be applied to all leases existing at the date of initial application. An entity may choose to use either (1) the standard's effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. The new standards are effective for public companies for fiscal years beginning after December 15, 2018. The Company adopted the new standards effective January 1, 2019 using the effective date as the date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standards will not be provided for periods before January 1, 2019. The standards provide a number of optional practical expedients in transition which the Company is continuing to evaluate. The Company does not expect the adoption of these standards to have a material impact on its results of operations or cash flows; however, the Company continues to evaluate the impact the adoption of the new standards will have on its financial position. While the Company continues to assess all of the effects of adoption, it currently believes the most significant effects relate to the recognition of new ROU assets and lease liabilities on its consolidated balance sheet for its operating leases and new disclosures about its leasing activities.

In June 2016, the FASB issued ASU No. 2016-13, "Financial Instruments – Credit Losses (Topic 326), Measurement of Credit Losses on Financial Instruments". The standard changes how credit losses are measured for most financial assets and certain other instruments that currently are not measured through net income. The standard will require an expected loss model for instruments measured at amortized cost as opposed to the current incurred loss approach. In valuing available for sale debt securities, allowances will be required to be recorded, rather than the current approach of reducing the carrying amount, for other than temporary impairments. A cumulative adjustment to retained earnings is to be recorded as of the beginning of the period of adoption to reflect the impact of applying the

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

provisions of the standard. The standard is effective for public companies for periods beginning after December 15, 2019 and the Company expects to adopt the new standard as of January 1, 2020. The Company has not yet determined what impact, if any, the adoption of this new standard will have on the Company's financial position, results of operations or cash flows.

In August 2016, the FASB issued ASU No. 2016-15, "Statement of Cash Flows (Topic 230), Classification of Certain Cash Receipts and Cash Payments (a consensus of the Emerging Issues Task Force)" which clarifies how certain cash receipts and cash payments should be presented on the statement of cash flows. The statement also addresses how the predominance principle should be applied when cash payments have aspects of more than one class of cash flows. The standard is effective for public companies in fiscal years beginning after December 15, 2017, and the Company adopted the standard effective January 1, 2018. The adoption of this standard did not have a material impact on the Company's consolidated statements of cash flows.

In October 2016, the FASB issued ASU No. 2016-16, "Income Taxes (Topic 740), Intra-Entity Transfers of Assets Other Than Inventory" which requires companies to account for the income tax effects of intercompany sales and transfers of assets other than inventory, such as intangible assets, when the transfer occurs. This is a change from previous guidance, which required companies to defer the income tax effects of intercompany transfers of assets until the asset has been sold to an outside party or otherwise recognized by being depreciated, amortized, or impaired. The new guidance requires companies to defer the income tax effects of only intercompany transfers of inventory. The standard is effective for public companies in fiscal years beginning after December 15, 2017. The Company adopted the new standard effective January 1, 2018. The application of this standard did not have a material impact on the Company's financial position, results of operations or cash flows.

In January 2017, the FASB issued ASU No. 2017-01, "Business Combinations (Topic 805), Clarifying the Definition of a Business," which provides additional guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The standard is effective for public companies for annual or interim periods beginning after December 15, 2017. The Company adopted the new standard effective January 1, 2018. The application of this standard did not have a material impact on the Company's financial position, results of operations or cash flows.

In August 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815), Targeted Improvements to Hedging Activities", to improve the financial reporting of hedging relationships to better portray the economic results of an entity's risk management activities in its financial statements. The new guidance is effective for public companies for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years with early adoption permitted in any interim period after its issuance. The Company adopted the new standard effective January 1, 2019. The Company does not expect the application of this standard to have a material impact on its financial position, results of operations or cash flows.

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", which permits companies to reclassify tax effects stranded in accumulated other comprehensive income ("OCI") as a result of tax reform impacting tax rates or other items, such as changing from a worldwide tax system to a territorial system, from OCI to retained earnings. Other tax effects stranded in OCI due to other reasons, such as prior changes in tax laws or changes in valuation allowances, may not be reclassified. Additional disclosures will also be required upon adoption of the new standard. The new standard is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company adopted this new standard effective January 1, 2019. The Company does not expect the adoption of this standard to have a material impact on its financial position, results of operations or cash flows.

In March 2018, the FASB issued ASU No. 2018-05 "Income Taxes (Topic 740), amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118 (SEC Update)", which addresses the accounting and disclosures around the enactment of the Tax Cuts and Jobs Act and the Securities and Exchange Commission's Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"). The Company adopted this new standard in the first quarter of 2018. See Note 14, Income Taxes, of the Notes to Consolidated Financial Statements included in this Annual Report, for the disclosures related to this amended guidance.

In August 2018, the FASB issued ASU No. 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement" which aims to improve the overall usefulness of disclosures to financial statement users and reduce unnecessary costs to companies when preparing fair value measurement disclosures. The standard is effective for annual and interim periods beginning after December 15, 2019 with early adoption permitted. The Company expects to adopt this new standard effective January 1, 2020. The Company does not expect the adoption of this new standard to have a material impact on its financial position, results of operations or cash flows.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

Forward-Looking Statements

This annual report contains forward-looking statements made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Statements contained anywhere in this Annual Report that are not limited to historical information are considered forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, including, without limitation, statements regarding:

- execution of the Company's growth and operation strategy;
- plans for technological innovation;
- compliance with covenants in our credit facility;
- liquidity and capital expenditures;
- sufficiency of working capital, cash flows and available capacity under the Company's credit facilities;
- compliance with government regulations;
- compliance with manufacturing and delivery timetables;
- forecasting of results;
- general economic trends and political uncertainty;
- government funding and growth of highway construction and commercial projects;
- taxes or usage fees;
- interest rates;
- integration of acquisitions;
- industry trends;
- pricing, demand and availability of steel, oil and liquid asphalt;
- development of domestic oil and natural gas production;
- condition of the economy;
- strength of the U.S. dollar relative to foreign currencies;
- the introduction of new products and the success of new product lines;
- presence in the international marketplace;
- suitability of our current facilities;
- future payment of dividends;
- competition in our business segments;
- product liability and other claims;
- obligations with respect to pellet plants and other products;
- protection of proprietary technology;
- demand for products;
- future fillings of backlogs;
- employees;
- the seasonality of our business;
- tax assets and reserves for uncertain tax positions;
- critical accounting policies and the impact of accounting changes;
- our backlog;
- ability to satisfy contingencies;
- contributions to retirement plans and plan expenses;
- reserve levels for self-insured insurance plans and product warranties;
- construction of new manufacturing facilities;
- supply of raw materials;
- inventories;
- plans to reduce indebtedness; and
- the Company's effective tax rate and other impacts of the Tax Cuts and Jobs Act of 2017.

These forward-looking statements are based largely on management's expectations, which are subject to a number of known and unknown risks, uncertainties and other factors discussed in this report and in other documents filed by the Company with the Securities and Exchange Commission, which may cause actual results, financial or otherwise, to be materially different from those anticipated, expressed or implied by the forward-looking statements. All forward-looking statements included in this document are based on information available to the Company on the date hereof, and the Company assumes no obligation to update any such forward-looking statements to reflect future events or circumstances. You can identify these statements by forward-looking words such as "expect", "believe", "anticipate", "goal", "plan", "intend", "estimate", "may", "will", "should", "could" and similar expressions.

MANAGEMENT'S DISCUSSION AND ANALYSIS (CONTINUED)

In addition to the risks and uncertainties identified elsewhere herein and in other documents filed by us with the Securities and Exchange Commission, the risk factors described in this document under the caption "Risk Factors" should be carefully considered when evaluating our business and future prospects, including without limitation risks relating to: changes or delays in highway funding; rising interest rates; changes in oil prices; changes in steel prices; changes in the general economy; unexpected capital expenditures and decreases in liquidity; the timing of large contracts; production capacity; general business conditions in the industry; non-compliance with covenants in the Company's credit facilities; demand for the Company's products; and those other factors listed from time to time in the Company's reports filed with the Securities and Exchange Commission. Certain of the risks, uncertainties and other factors discussed above are more fully described in the section titled "Risk Factors" in the Company's Annual Report on Form 10-K for the year ended December 31, 2018.

ASTEC INDUSTRIES, INC.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

The management of Astec Industries, Inc. and subsidiaries (the "Company") is responsible for establishing and maintaining adequate internal control over financial reporting for the Company. The 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 U.S. generally accepted accounting principles. The 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 assets of the Company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. 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 and procedures may deteriorate.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis.

Management, under the supervision and with the participation of the Company's principal executive officer and principal financial officer, evaluated the effectiveness of the Company's internal control over financial reporting as of December 31, 2018 using the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in *Internal Control - Integrated Framework (2013)* ("COSO 2013 Framework").

Based on this assessment, the following control deficiencies in internal control over financial reporting were identified as of December 31, 2018.

Corporate

Goodwill Impairment

We did not design effective management review controls over the annual goodwill impairment test. Specifically, (i) management's corroboration of assumptions used in the third-party valuation analyses was not conducted at a sufficient level of precision and (ii) we did not have effective controls over the methods and accuracy of calculations performed by a third-party valuation specialist retained by the Company.

These deficiencies were due to insufficient knowledge and experience of the Company's personnel with a Step 1 quantitative goodwill impairment assessment in accordance with FASB ASC Topic 350, *Intangibles – Goodwill and Other*, and the fact that the Company did not perform an effective risk assessment process to evaluate relevant risks of material misstatement associated with the valuation of goodwill.

Income Taxes

We did not operate effective controls over (i) the completeness and accuracy of the data used in the determination of the current and deferred income tax balances at a sufficient level of precision and (ii) the formulas embedded in the spreadsheets used in the income tax calculations.

These deficiencies resulted from an ineffective risk assessment process to evaluate the relevant risks inherent in the determination of the year-end income tax provision and related disclosures.

Business Units

We did not have sufficient trained resources that were knowledgeable and experienced in the application of the COSO 2013 Framework to our financial reporting processes and related internal controls at certain business units. We did not have sufficient Corporate monitoring activities over certain business units that resulted in the following control deficiencies:

ASTEC INDUSTRIES, INC.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING (CONTINUED)

General Information Technology Controls

We did not design and maintain effective general information technology controls ("GITCs") related to the newly implemented enterprise resource planning ("ERP") system at Roadtec, Inc. ("Roadtec"), a subsidiary which operates as a business unit in the Infrastructure segment. Specifically, we did not:

- design and maintain an effective systems development plan to test and approve the pre-production and post-production implementation of the Roadtec ERP system aligned with the business and information technology requirements;
- design and implement effective program change management controls over the Roadtec ERP system; and
- design and implement effective user access controls in the Roadtec ERP system to ensure appropriate segregation of duties and to adequately restrict user and privileged access to appropriate Roadtec personnel.

These deficiencies resulted from the lack of experience on the part of Roadtec's IT personnel with the implementation of a complex IT system and insufficient understanding of the risks presented by such implementation. In addition, users of the new ERP system were not sufficiently trained in the system's functionalities to ensure their appropriate use and operation. As a result of these GITC deficiencies, the automated controls across substantially all financial reporting processes of the Roadtec business unit that depend on the effective operation of the GITCs and manual controls that are dependent upon the completeness and accuracy of information derived from the Roadtec ERP system were also considered to be ineffective.

Revenue Recognition

We did not design and operate effective controls over the accuracy and disclosure of revenue recognized from the Company's contracts with customers at certain of the Company's business units. Specifically, we did not:

- design, implement and operate effective controls at a sufficient level of precision over the identification and allocation of the transaction price to multiple performance obligations in accordance with FASB ASC Topic 606, *Revenue from Contracts with Customers* ("ASC 606");
- design, implement and operate effective controls over the accuracy of pricing of parts sales; and
- design, implement and effectively perform controls over the identification of sales transactions by category for purposes of preparing disclosures required by ASC 606 and elimination of intercompany transactions.

These deficiencies were due to management of certain business units not sufficiently understanding the requirements of ASC 606 and changes required to the business units' specific revenue recognition policies and transaction processes. The Company did not perform an effective risk assessment process to understand the changes necessary to the financial reporting process and related controls at these business units to address the risks relating to the recognition, measurement and presentation of revenue in accordance with the new accounting standard.

Inventories

We did not design and operate effective controls over the existence, accuracy and valuation of inventories at certain of the Company's business units. Specifically, we did not have effective operation of controls ensuring that all inventory counts were performed, over the accuracy of capitalized labor costs and the review of the inventory reserve calculations at certain business units.

These deficiencies were due to management of certain business units not sufficiently understanding the risks of material misstatement related to these inventory assertions.

The control deficiencies described above resulted in several misstatements to the Company's preliminary consolidated financial statements that were corrected prior to the issuance of the annual consolidated financial statements. These control deficiencies create a reasonable possibility that a material misstatement to the consolidated financial statements will not be prevented or detected on a timely basis, and, therefore, we concluded that the deficiencies represent material weaknesses in our internal control over financial reporting and therefore that our internal control over financial reporting was not effective as of December 31, 2018.

Our independent registered public accounting firm, KPMG LLP, who audited the consolidated financial statements included in this annual report, has expressed an adverse opinion on the operating effectiveness of the Company's internal control over financial reporting. KPMG LLP's report appears on page 69 of this annual report.

ASTEC INDUSTRIES, INC.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING (CONTINUED)

Management's Remediation Plan

Management has been implementing and continues to implement measures designed to ensure that control deficiencies contributing to the material weaknesses are remediated, such that these controls are designed, implemented and operating effectively. The remediation actions include:

1. designing and implementing enhanced controls for the goodwill impairment analysis, including control activities associated with the review of data provided to third-party valuation specialists and the appropriateness of the assumptions and methodology used to measure the fair value of reporting units and the reasonableness of the conclusions in the third-party valuation specialists' reports;
2. evaluating the assignment of responsibilities associated with the accounting for goodwill impairment, including considering hiring additional resources or providing additional training to existing resources;
3. implementing income tax software to automate the calculation of our income tax expense (benefit) and the impact on the income tax related balance sheet accounts;
4. educating and re-training employees at certain business units on our business processes and internal controls such that employees are aware of the importance of designing and operating effective internal controls to mitigate the risks identified;
5. hiring additional employees, with the appropriate expertise and competence, to assume assigned responsibility and accountability for monitoring the financial reporting processes and internal controls at business units;
6. designing and implementing additional Corporate monitoring activities over internal controls at certain business units;
7. developing and providing additional training to employees at Roadtec to enhance their understanding of Roadtec's new ERP system so that they can effectively operate the system and have sufficient knowledge about GITCs, with a focus on those related to program change management and user access over systems impacting financial reporting;
8. designing and implementing enhanced controls at Roadtec related to program change management and user access over systems impacting financial reporting;
9. designing and implementing enhanced controls to monitor the effectiveness of the underlying business process controls at Roadtec that are dependent on the data and financial reports generated from the ERP system;
10. developing a training program for management at certain business units to increase their knowledge of revenue recognition and the related disclosures in accordance with ASC 606;
11. Corporate management performing site visits at certain business units and evaluating revenue recognition for certain equipment contracts in accordance with ASC 606;
12. designing and implementing enhanced controls over the accuracy of pricing for parts sales and completeness and accuracy of intercompany sales transactions at certain business units; and
13. designing and implementing enhanced controls over the existence, accuracy and valuation of inventories at certain business units.

Management believes that these actions, and the improvements achieved as a result, will effectively remediate the material weaknesses. However, the material weaknesses in our internal control over financial reporting will not be considered remediated until the remediated controls operate for a sufficient period of time and management has concluded, through testing, that these controls are operating effectively.

Management is committed to implementing the planned remediation actions as promptly as possible and will provide regular updates (at least on a quarterly basis) to the Audit Committee of the Board of Directors regarding the progress of its remediation efforts.

As a result of the material weaknesses noted above, the Company completed additional substantive procedures prior to issuing its annual report for the year ended December 31, 2018. Based on these procedures, management believes that the Company's consolidated financial statements included in this annual report have been prepared in accordance with generally accepted accounting principles. In addition, these material weaknesses did not result in any restatement of prior-period consolidated financial statements and there were no changes in previously released financial results. The Company's principal executive officer and principal financial officer have certified that, based on such officer's knowledge, the consolidated financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the Company as of, and for, the periods presented in this annual report. In addition, management developed a remediation plan for these material weaknesses, which is described above.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors:
Astec Industries, Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Astec Industries, Inc. and subsidiaries' (the "Company") internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weaknesses, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the consolidated balance sheets of the Company as of December 31, 2018 and 2017, and the related consolidated statements of operations, comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2018, and related notes (collectively, the "consolidated financial statements"), and our report dated March 15, 2019 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis. The following material weaknesses have been identified and included in management's assessment:

- Ineffective management review controls over the annual goodwill impairment assessment due to insufficient knowledgeable and experienced personnel and ineffective risk assessment;
- Ineffective controls over the completeness and accuracy of data and formulas embedded in the spreadsheets used in income tax calculations due to ineffective risk assessment;
- Insufficient trained personnel knowledgeable and experienced in the application of the COSO 2013 Framework at certain business units and insufficient corporate monitoring of certain business units;
- Ineffective general information technology controls over the newly implemented enterprise resource planning system at the Roadtec subsidiary due to the lack of experienced personnel in implementing complex IT systems and insufficient training on the IT system's functionalities;
- Ineffective controls over the accuracy and disclosure of revenue at certain business units due to insufficient understanding of the requirements of revenue recognition and not performing an effective risk assessment; and
- Ineffective controls over the existence, accuracy and valuation of inventories at certain business units due to insufficient understanding of relevant risks of material misstatement.

The material weaknesses were considered in determining the nature, timing, and extent of audit tests applied in our audit of the 2018 consolidated financial statements, and this report does not affect our report on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM (CONTINUED)

accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) 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 (3) 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.

KPMG LLP

Knoxville, Tennessee
March 15, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and Board of Directors
Astec Industries, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Astec Industries, Inc. and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income (loss), equity and cash flows for each of the years in the three-year period ended December 31, 2018, and the related notes (collectively, the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2018, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) ("PCAOB"), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated March 15, 2019 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits 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. We believe that our audits provide a reasonable basis for our opinion.

KPMG LLP

We have served as the Company's auditor since 2015.

Knoxville, Tennessee
March 15, 2019

CONSOLIDATED BALANCE SHEETS

(in thousands, except per share data)

	December 31	
	2018	2017
Assets		
Current assets:		
Cash and cash equivalents	\$ 25,821	\$ 62,280
Investments	1,946	1,624
Trade receivables, net	130,569	114,786
Other receivables	3,409	5,166
Inventories	355,944	391,379
Prepaid income taxes	24,459	12,556
Prepaid expenses and other assets	18,843	15,178
Total current assets	560,991	602,969
Property and equipment, net	192,448	190,396
Investments	14,890	14,553
Goodwill	32,748	45,732
Intangible assets, net	25,370	30,952
Deferred tax assets	27,490	2,576
Other long-term assets	1,520	2,401
Total assets	\$ 855,457	\$ 889,579
Liabilities and Equity		
Current liabilities:		
Current maturities of long-term debt	\$ 413	\$ 2,469
Accounts payable	70,614	60,417
Customer deposits	48,069	49,381
Accrued product warranty	10,928	15,410
Accrued payroll and related liabilities	24,126	23,297
Accrued loss reserves	1,832	2,504
Other accrued liabilities	33,249	25,668
Total current liabilities	189,231	179,146
Long-term debt	59,709	1,575
Deferred income tax liabilities	1,020	1,509
Other long-term liabilities	20,207	20,584
Total liabilities	270,167	202,814
Equity:		
Preferred stock - authorized 4,000 shares of \$1.00 par value; none issued	--	--
Common stock - authorized 40,000 shares of \$0.20 par value; issued and outstanding - 22,513 in 2018 and 23,070 in 2017	4,503	4,614
Additional paid-in capital	120,601	141,931
Accumulated other comprehensive loss	(33,883)	(24,243)
Company shares held by SERP, at cost	(1,886)	(1,960)
Retained earnings	495,245	565,330
Shareholders' equity	584,580	685,672
Non-controlling interest	710	1,093
Total equity	585,290	686,765
Total liabilities and equity	\$ 855,457	\$ 889,579

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF OPERATIONS

(in thousands, except per share data)

Year Ended December 31

	2018	2017	2016
Net sales	\$ 1,171,599	\$ 1,184,739	\$ 1,147,431
Cost of sales	1,035,833	941,610	882,162
Gross profit	135,766	243,129	265,269
Selling, general and administrative expenses	180,795	160,775	153,145
Research and development expenses	28,332	26,817	24,969
Restructuring and asset impairment charges	13,060	--	--
Income (loss) from operations	(86,421)	55,537	87,155
Other income:			
Interest expense	(1,045)	(840)	(1,395)
Interest income	952	1,302	806
Other income	536	1,218	529
Income (loss) before income taxes	(85,978)	57,217	87,095
Income tax provision (benefit)	(25,234)	19,627	32,107
Net income (loss)	(60,744)	37,590	54,988
Net loss attributable to non-controlling interest	295	205	171
Net income (loss) attributable to controlling interest	\$ (60,449)	\$ 37,795	\$ 55,159
Earnings (loss) per Common Share:			
Net income (loss) attributable to controlling interest:			
Basic	\$ (2.64)	\$ 1.64	\$ 2.40
Diluted	(2.64)	1.63	2.38
Weighted average number of common shares outstanding:			
Basic	22,902	23,025	22,992
Diluted	22,902	23,184	23,142

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(in thousands)

Year Ended December 31

	2018	2017	2016
Net income (loss)	\$ (60,744)	\$ 37,590	\$ 54,988
Other comprehensive income (loss):			
Change in unrecognized pension and post-retirement benefit costs	(162)	689	(80)
Tax (expense) benefit on change in unrecognized pension and post-retirement benefit costs	38	(69)	29
Foreign currency translation adjustments	(9,516)	6,699	(2,420)
Tax expense on foreign currency translation adjustments	--	--	(5,527)
Other comprehensive income (loss)	(9,640)	7,319	(7,998)
Comprehensive loss attributable to non-controlling interest	439	232	137
Comprehensive income (loss) attributable to controlling interest	\$ (69,945)	\$ 45,141	\$ 47,127

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF CASH FLOWS

(in thousands)

Year Ended December 31

Cash Flows from Operating Activities

	2018	2017	2016
Net income (loss)	\$ (60,744)	\$ 37,590	\$ 54,988
Adjustments to reconcile net income (loss) to net cash provided (used) by operating activities:			
Depreciation	22,411	21,312	20,818
Amortization	5,502	4,490	3,995
Provision for doubtful accounts	223	482	280
Provision for warranties	13,219	16,725	18,912
Deferred compensation provision (benefit)	(1,554)	(574)	1,742
Deferred income tax benefit	(25,385)	(291)	(3,521)
Gain on disposition of fixed assets	(71)	(388)	(224)
Stock-based compensation	2,182	3,142	2,936
Restructuring and asset impairment charges	13,060	--	--
Distributions to SERP participants	(767)	(206)	(532)
Change in operating assets and liabilities, net of effects of acquisitions:			
Sale (purchase) of trading securities, net	(758)	473	(1,873)
Trade and other receivables	(16,189)	(7,749)	(4,895)
Inventories	30,757	(19,618)	30,839
Prepaid expenses	(11,943)	(5,181)	4,846
Other assets	(3,698)	(779)	2,069
Accounts payable	9,843	630	8,836
Customer deposits	(522)	9,379	(762)
Accrued product warranty	(17,539)	(14,642)	(15,125)
Income taxes payable	3,683	(597)	181
Accrued retirement benefit costs	(1,100)	45	(50)
Accrued loss reserves	(125)	122	229
Other accrued liabilities	8,887	(1,118)	11,142
Other	843	(1,366)	(25)
Net cash provided (used) by operating activities	(29,785)	41,881	134,806
Cash Flows from Investing Activities			
Business acquisition, net of cash acquired	--	(26,443)	(39,764)
Proceeds from sale of property and equipment	375	480	614
Expenditures for property and equipment	(27,440)	(20,046)	(27,367)
Sale (purchase) of investments	(360)	(891)	290
Net cash used by investing activities	(27,425)	(46,900)	(66,227)

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF CASH FLOWS (CONTINUED)

(in thousands)

Year Ended December 31

Cash Flows from Financing Activities

Payment of dividends	\$ (9,625)	\$ (9,226)	\$ (9,217)
Borrowings under bank loans	148,504	--	5,973
Repayment of bank loans	(91,964)	(7,242)	(5,903)
Purchase of shares of subsidiaries	(28)	(106)	(696)
Sale (purchase) of Company shares by SERP, net	377	289	(153)
Withholding tax paid upon vesting of restricted stock units	(432)	(507)	(1,024)
Repurchase of Company stock	(24,138)	--	--
Net cash provided (used) by financing activities	22,694	(16,792)	(11,020)
Effect of exchange rates on cash	(1,943)	1,720	(250)
Increase (decrease) in cash and cash equivalents	(36,459)	(20,091)	57,309
Cash and cash equivalents, beginning of year	62,280	82,371	25,062
Cash and cash equivalents, end of year	\$ 25,821	\$ 62,280	\$ 82,371

Supplemental Cash Flow Information

Cash paid during the year for:

Interest	\$ 856	\$ 588	\$ 1,407
Income taxes, net of refunds	\$ 8,523	\$ 26,917	\$ 28,455

	2018	2017	2016
	\$ (9,625)	\$ (9,226)	\$ (9,217)
	148,504	--	5,973
	(91,964)	(7,242)	(5,903)
	(28)	(106)	(696)
	377	289	(153)
	(432)	(507)	(1,024)
	(24,138)	--	--
	22,694	(16,792)	(11,020)
	(1,943)	1,720	(250)
	(36,459)	(20,091)	57,309
	62,280	82,371	25,062
	\$ 25,821	\$ 62,280	\$ 82,371
	\$ 856	\$ 588	\$ 1,407
	\$ 8,523	\$ 26,917	\$ 28,455

See Notes to Consolidated Financial Statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

	Common Stock Shares	Common Stock Amount	Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Company Shares Held by SERP	Retained Earnings	Non- Controlling Interest	Total Equity
Balance December 31, 2015	22,988	\$ 4,598	\$ 137,883	\$ (23,564)	\$ (1,778)	\$ 490,933	\$ 1,786	\$ 609,858
Net income						55,159	(171)	54,988
Dividends (\$0.40 per share)			9			(9,226)		(9,217)
Other comprehensive loss				(7,998)				(7,998)
Change in ownership percentage of subsidiary							(1,322)	(1,322)
Stock-based compensation	5	1	2,935					2,936
RSU vesting	53	10	(10)					--
Withholding tax on vested RSUs			(1,024)					(1,024)
Sale of Company stock held by SERP, net			27		(180)			(153)
Cumulative effect of adopting ASU No. 2016-09			150			(95)		55
Other							718	718
Balance December 31, 2016	23,046	4,609	139,970	(31,562)	(1,958)	536,771	1,011	648,841
Net income						37,795	(205)	37,590
Dividends (\$0.40 per share)			10			(9,236)		(9,226)
Other comprehensive income				7,319				7,319
Change in ownership percentage of subsidiary							(43)	(43)
Stock-based compensation	1		2,172					2,172
RSU vesting	23	5	(5)					--
Withholding tax on vested RSUs			(507)					(507)
Sale of Company stock held by SERP, net			291		(2)			289
Other							330	330
Balance December 31, 2017	23,070	4,614	141,931	(24,243)	(1,960)	565,330	1,093	686,765
Net loss						(60,449)	(295)	(60,744)
Dividends (\$0.42 per share)			11			(9,636)		(9,625)
Other comprehensive loss				(9,640)				(9,640)
Change in ownership percentage of subsidiary							(159)	(159)
Stock-based compensation	2		2,815					2,815
RSU vesting	23	5	(5)					--
Withholding tax on vested RSUs			(432)					(432)
Sale of Company stock held by SERP, net			303		74			377
Repurchase of Company stock	(582)	(116)	(24,022)					(24,138)
Other							71	71
Balance December 31, 2018	22,513	\$ 4,503	\$ 120,601	\$ (33,883)	\$ (1,886)	\$ 495,245	\$ 710	\$ 585,290

See Notes to Consolidated Financial Statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

1. Summary of Significant Accounting Policies

Basis of Presentation - The consolidated financial statements include the accounts of Astec Industries, Inc. and its domestic and foreign subsidiaries (the "Company"). The Company's significant wholly-owned and consolidated subsidiaries at December 31, 2018 are as follows:

Astec Australia Pty Ltd	Astec do Brasil Fabricacao de Equipamentos Ltda. (93% owned)
Astec, Inc.	Astec Insurance Company
Astec Industries LatAm SpA	Astec Mobile Machinery GmbH
Astec Mobile Screens, Inc.	Breaker Technology, Inc.
Breaker Technology Ltd.	Carlson Paving Products, Inc.
CEI Enterprises, Inc.	GEFCO, Inc.
Heatec, Inc.	Johnson Crushers International, Inc.
Kolberg-Pioneer, Inc.	Osborn Engineered Products SA (Pty) Ltd (99% owned)
Peterson Pacific Corp.	Power Flame Incorporated
RexCon, Inc.	Roadtec, Inc.
Telestack Limited	TelSmith, Inc.

All intercompany accounts and transactions have been eliminated in consolidation.

Use of Estimates - The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported and disclosed in the financial statements and accompanying notes. Actual results could differ from those estimates.

Foreign Currency Translation - Subsidiaries located in Australia, Brazil, Canada, Chile, Germany, Northern Ireland, and South Africa operate primarily using local functional currencies. Accordingly, assets and liabilities of these subsidiaries are translated using exchange rates in effect at the end of the period, and revenues and costs are translated using average exchange rates for the period. The resulting adjustments are presented as a separate component of accumulated other comprehensive income (loss). Foreign currency transaction gains and losses, net are included in cost of sales and amounted to gains of \$539 and \$431 in 2018 and 2017, respectively and a loss of \$246 in 2016.

Fair Value of Financial Instruments - For cash and cash equivalents, trade receivables, other receivables and accounts payable, the carrying amount approximates the fair value because of the short-term nature of those instruments. Trading equity investments are valued at their estimated fair value based on their quoted market prices and debt securities are valued based upon a mix of observable market prices and model driven prices derived from a matrix of observable market prices for assets with similar characteristics obtained from a nationally recognized third party pricing service.

Financial assets and liabilities are categorized as of the end of each reporting period based upon the level of judgment associated with the inputs used to measure their fair value. The inputs used to measure the fair value are identified in the following hierarchy:

- Level 1 - Unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2 - Unadjusted quoted prices in active markets for similar assets or liabilities; or unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active; or inputs other than quoted prices that are observable for the asset or liability.
- Level 3 - Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

All financial assets and liabilities held by the Company at December 31, 2018 and 2017 are classified as Level 1 or Level 2, as summarized in Note 3, Fair Value Measurements.

Cash and Cash Equivalents - All highly liquid investments with an original maturity of three months or less when purchased are considered to be cash and cash equivalents.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Investments - Investments consist primarily of investment-grade marketable securities. Trading securities are carried at fair value, with unrealized holding gains and losses included in net income. Realized gains and losses are accounted for on the specific identification method. Purchases and sales are recorded on a trade date basis. Management determines the appropriate classification of its investments at the time of acquisition and reevaluates such determination at each balance sheet date.

Accounts Receivable - The Company sells products to a wide variety of customers. Accounts receivable are carried at their outstanding principal amounts, less an allowance for doubtful accounts. The Company extends credit to its customers based on an evaluation of the customers' financial condition generally without requiring collateral, although the Company normally requires advance payments or letters of credit on large equipment orders. Credit risk is driven by conditions within the economy and the industry and is principally dependent on each customer's financial condition. To minimize credit risk, the Company monitors credit levels and financial conditions of customers on a continuing basis. After considering historical trends for uncollectible accounts, current economic conditions and specific customer recent payment history and financial stability, the Company records an allowance for doubtful accounts at a level which management believes is sufficient to cover probable credit losses. Amounts are deemed past due when they exceed the payment terms agreed to by the customer in the sales contract. Past due amounts are charged off when reasonable collection efforts have been exhausted and the amounts are deemed uncollectible by management. As of December 31, 2018, concentrations of credit risk with respect to receivables are limited due to the wide variety of customers.

Allowance for Doubtful Accounts - The following table represents a rollforward of the allowance for doubtful accounts for the years ended December 31, 2018, 2017 and 2016:

Year Ended December 31			
	2018	2017	2016
Allowance balance, beginning of year	\$ 1,716	\$ 1,511	\$ 1,837
Provision	223	482	280
Write offs	(696)	(308)	(560)
Other	(59)	31	(46)
Allowance balance, end of year	\$ 1,184	\$ 1,716	\$ 1,511

Inventories - The Company's inventory is comprised of raw materials, work-in-process, finished goods and used equipment.

Raw material inventory is comprised of purchased steel and other purchased items for use in the manufacturing process or held for sale for the after-market parts business. The category also includes the manufacturing cost of completed equipment sub-assemblies produced for either integration into equipment manufactured at a later date or for sale in the Company's after-market parts business.

Work-in-process inventory consists of the value of materials, labor and overhead incurred to date in the manufacturing of incomplete equipment or incomplete equipment sub-assemblies being produced.

Finished goods inventory consists of completed equipment manufactured for sale to customers.

Used equipment inventory consists of equipment accepted in trade or purchased on the open market. The category also includes equipment rented to prospective customers on a short-term or month-to-month basis. Used equipment is valued at the lower of acquired or trade-in cost or net realizable value determined on each separate unit. Each unit of rental equipment is valued at the lower of original manufacturing, acquired or trade-in cost or net realizable value.

Inventories are valued at the lower of cost (first-in, first-out) or net realizable value, which requires the Company to make specific estimates, assumptions and judgments in determining the amount, if any, of reductions in the valuation of inventories to their net realizable values. The net realizable values of the Company's products are impacted by a number of factors, including changes in the price of steel, competitive sales pricing, quantities of inventories on hand, the age of the individual inventory items, market acceptance of the Company's products, the Company's normal gross margins, actions by our competitors, the condition of our used and rental inventory and general economic factors. Once an inventory item's value has been deemed to be less than cost, a net realizable value allowance is calculated and a new "cost basis" for that item is effectively established. This new cost is retained for that item until such time as the item is disposed of or the Company determines that an additional write-down is necessary. Additional write-downs may be required in the future based upon changes in assumptions due to general economic downturns in the markets in which the Company operates, changes in competitor pricing, new product design or other

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

technological advances introduced by the Company or its competitors and other factors unique to individual inventory items.

The most significant component of the Company's inventory is steel. A significant decline in the market price of steel could result in a decline in the market value of the equipment or parts we sell. During periods of significant declining steel prices, the Company reviews the valuation of its inventories to determine if reductions are needed in the recorded value of inventory on hand to its net realizable value.

The Company reviews the individual items included in its finished goods, used equipment and rental equipment inventory on a model-by-model or unit-by-unit basis to determine if any item's net realizable value is below its carrying value. This analysis is expanded to include items in work-in-process and raw material inventory if factors indicate those items may also be impacted. In performing this review, judgments are made and, in addition to the factors discussed above, additional consideration is given to the age of the specific items of used or rental inventory, prior sales offers or lack thereof, the physical condition of the specific items and general market conditions for the specific items. Additionally, an analysis of raw material inventory is performed to calculate reserves needed for obsolete inventory based upon quantities of items on hand, the age of those items and their recent and expected future usage or sale.

When the Company determines that the value of inventory has become impaired through damage, deterioration, obsolescence, changes in price levels, excessive levels of inventory or other causes, the Company reduces the carrying value to the net realizable value based on estimates, assumptions and judgments made from the information available at that time. Abnormal amounts of idle facility expense, freight, handling cost and wasted materials are recognized as current period charges.

Property and Equipment - Property and equipment is stated at cost. Depreciation is calculated for financial reporting purposes using the straight-line method based on the estimated useful lives of the assets as follows: airplanes (20 years), buildings (40 years) and equipment (3 to 10 years). Both accelerated and straight-line methods are used for tax compliance purposes. Routine repair and maintenance costs and planned major maintenance are expensed when incurred.

Goodwill and Other Intangible Assets - The Company classifies intangible assets as either intangible assets with definite lives subject to amortization or goodwill.

The Company tests intangible assets with definite lives for impairment if conditions exist that indicate the carrying value may not be recoverable. Such conditions may include an economic downturn in a geographic market or a change in the assessment of future operations. An impairment charge is recorded when the carrying value of the definite lived intangible asset is not recoverable by the future undiscounted cash flows expected to be generated from the use of the asset.

The Company determines the useful lives of identifiable intangible assets after considering the specific facts and circumstances related to each intangible asset. Factors considered when determining useful lives include the contractual terms of agreements, the history of the asset, the Company's long-term strategy for the use of the asset, any laws or other local regulations which could impact the useful life of the asset, and other economic factors, including competition and specific market conditions. Intangible assets that are deemed to have definite lives are amortized over their useful lives as follows: dealer network and customer relationships: 8-19 years; trade names: 15 years; other: 5-19 years.

Goodwill is not amortized. The Company tests goodwill for impairment during the fourth quarter of each year or more frequently if events or circumstances indicate that goodwill might be impaired. Beginning in 2018, the Company changed its annual goodwill impairment testing date from December 31 to October 31 to better align the testing date with its financial planning process and alleviate resource constraints. The Company would not expect a materially different outcome in any given year as a result of testing on October 31 as compared to December 31. The Company uses qualitative factors to determine whether it is more likely than not (a likelihood of more than 50 percent) that the fair value of a reporting unit is less than its carrying value, including goodwill. The Company estimates the fair values of each of its reporting units with goodwill using the income approach.

The income approach uses a reporting unit's projection of estimated future operating results and cash flows which are then discounted using a weighted average cost of capital determined based on current market conditions for the individual reporting unit. The projection uses management's best estimates of cash flows over the projection period based on estimates of annual and terminal growth rates in sales and costs, changes in operating margins, selling, general and administrative expenses, working capital requirements and capital expenditures. Other factors used in evaluating the fair value of a reporting unit could include deterioration in the general economy, fluctuations in foreign exchange, deterioration in the industry or markets in which the reporting unit operates, an increased competitive

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

market, a regulatory or political development in the market, increases in raw materials, labor costs or other factors that have a negative effect on earnings and cash flows, a decline in actual or budgeted earnings and cash flows, or entity specific changes in management, key personnel, strategy or customer base. If the fair value of a reporting unit is found to be less than its book value, the Company will record an impairment loss equal to the excess, if any, of the book value over the fair value.

The fair value of reporting units that do not have goodwill are estimated using either the income or market approaches, depending on which approach is the most appropriate for each reporting unit. The fair value of the reporting units that serve operating units in supporting roles, such as the captive insurance company and the corporate reporting unit are estimated using the cost approach. The sum of the fair values of all reporting units is compared to the fair value of the consolidated Company, calculated using the market approach, which is inferred from the market capitalization of the Company at the date of the valuation, to confirm that the Company's estimation of the fair value of its reporting units is reasonable.

Determining the fair values of the Company's reporting units involves the use of significant estimates and assumptions. Due to the inherent uncertainty involved in making these estimates and assumptions, actual results could differ materially from those estimates.

Impairment of Long-lived Assets - In the event that facts and circumstances indicate the carrying amounts of long-lived assets may be impaired, an evaluation of recoverability is performed. If an evaluation is required, the estimated future undiscounted cash flows associated with the asset are compared to the carrying amount for each asset (or group of assets) to determine if a write-down is required. If this review indicates that the assets will not be recoverable, the carrying values of the impaired assets are reduced to their estimated fair value. Fair value is estimated using discounted cash flows, prices for similar assets or other valuation techniques.

Self-Insurance Reserves - The Company retains the risk for a portion of its workers' compensation claims and general liability claims by way of a captive insurance company, Astec Insurance Company ("Astec Insurance" or the "captive"). The objectives of Astec Insurance are to improve control over and reduce the cost of claims; to improve focus on risk reduction with the development of a program structure which rewards proactive loss control; and to ensure management participation in the defense and settlement process for claims.

For general liability claims, the captive is liable for the first \$1,000 per occurrence. The Company carries general liability, excess liability and umbrella policies for claims in excess of amounts covered by the captive.

For workers' compensation claims, the captive is liable for the first \$350 per occurrence. The Company utilizes a large national insurance company as third-party administrator for workers' compensation claims and carries insurance coverage for claims liabilities in excess of amounts covered by the captive.

The financial statements of the captive are consolidated into the financial statements of the Company. The short-term and long-term reserves for claims and potential claims related to general liability and workers' compensation under the captive are included in accrued loss reserves or other long-term liabilities, respectively, in the consolidated balance sheets depending on the expected timing of future payments. The undiscounted reserves are actuarially determined to cover the ultimate cost of each claim based on the Company's evaluation of the type and severity of individual claims and historical information, primarily its own claims experience, along with assumptions about future events. Changes in assumptions, as well as changes in actual experience, could cause these estimates to change in the future. However, the Company does not believe it is reasonably likely that the reserve level will materially change in the foreseeable future.

The Company is self-insured for health and prescription claims under its Group Health Insurance Plan at all but one of the Company's domestic manufacturing subsidiaries. The Company carries reinsurance coverage to limit its exposure for individual health claims above certain limits. Third parties administer health claims and prescription medication claims. The Company maintains a reserve for the self-insured health plan which is included in accrued loss reserves on the Company's consolidated balance sheets. This reserve includes both unpaid claims and an estimate of claims incurred but not reported, based on historical claims and payment experience. Historically, the reserves have been sufficient to provide for claims payments. Changes in actual claims experience or payment patterns could cause the reserve to change, but the Company does not believe it is reasonably likely that the reserve level will materially change in the near future.

The remaining U.S. subsidiary is covered under a fully insured group health plan. Employees of the Company's foreign subsidiaries are insured under separate health plans. No reserves are necessary for these fully-insured health plans.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Revenue Recognition - Revenue is generally recognized on sales at the point in time when pervasive evidence of an arrangement exists, the price is fixed and determinable, the product has been delivered or services have been rendered and there is reasonable assurance of collection of the sales proceeds. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring goods or providing services. The Company generally obtains purchase authorizations from its customers for a specified amount of products at a specified price with specific delivery terms. A significant portion of the Company's equipment sales represents equipment produced in the Company's manufacturing facilities under short-term contracts for a customer's project or equipment designed to meet a customer's requirements. Most of the equipment sold by the Company is based on standard configurations, some of which are modified to meet customer's needs or specifications. The Company provides customers with technical design and performance specifications and typically performs pre-shipment testing, when feasible, to ensure the equipment performs according to the customer's need, regardless of whether the Company provides installation services in addition to selling the equipment. Significant down payments are required on many equipment orders with other terms allowing for payment shortly after shipment, typically 30 days. Taxes assessed by a governmental authority that are directly imposed on revenue-producing transactions between the Company and its customers, such as sales, use, value-added and some excise taxes, are excluded from revenue. Expected warranty costs for our standard warranties are expensed at the time the related revenue is recognized. Costs of obtaining sales contracts with an expected duration of one year or less are expensed as incurred. As contracts are typically fulfilled within one year from the date of the contract, revenue adjustments for a potential financing component or the costs to obtain the contract are not made.

Depending on the terms of the arrangement with the customer, recognition of a portion of the consideration received may be deferred and recorded as a contract liability if we have to satisfy a future obligation, such as to provide installation assistance, service work to be performed in the future without charge, floor plan interest to be reimbursed to our dealer customers, payments for extended warranties, for annual rebates given to certain high volume customers or for obligations for future estimated returns to be allowed based upon historical trends.

Certain contracts include terms and conditions pursuant to which the Company recognizes revenues upon the completion of production, and the equipment is subsequently stored at the Company's plant at the customer's request. Revenue is recorded on such contracts upon the customer's assumption of title and risk of ownership, which transfers control of the equipment, and when collectability is reasonably assured. In addition, there must be a fixed schedule of delivery of the goods consistent with the customer's business practices, the Company must not have retained any specific performance obligations such that the earnings process is not complete and the goods must have been segregated from the Company's inventory prior to revenue recognition.

The Company had one large pellet plant sale on which revenue was recorded over time based upon the ratio of costs incurred to estimated total costs. Penalties were accounted for as a reduction in sales.

Service and Equipment Installation Revenue – Purchasers of certain of the Company's equipment often contract with the Company to provide installation services. Installation is typically separately priced in the contract based upon observable market prices for stand-alone performance obligations or a cost plus margin approach when one is not available. The Company may also provide future services on equipment sold at the customer's request, which may be for equipment repairs after the warranty period expires. Service is billed on a cost plus margin approach or at a standard rate per hour.

Used Equipment Sales - Used equipment is obtained by trade-in on new equipment sales, as a separate purchase in the open market or from the Company's equipment rental business. Revenues from the sale of used equipment are recognized upon transfer of control to the customer at agreed upon pricing.

Freight Revenue – Under a practical expedient allowed under ASU 2014-09, the Company records revenues earned for shipping and handling as revenue at the time of shipment, regardless of whether or not it is identified as a separate performance obligation. The cost of shipping and handling is classified as cost of goods sold concurrently.

Other Revenues – Miscellaneous revenues and offsets not associated with one of the above classifications include rental revenues, extended warranty revenues, early pay discounts and floor plan interest reimbursements.

Advertising Expense - The cost of advertising is expensed as incurred. The Company incurred \$4,136, \$3,793, and \$4,045 in advertising costs during 2018, 2017 and 2016, respectively, which is included in selling, general and administrative expenses.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Income Taxes - Income taxes are based on pre-tax financial accounting income. Deferred tax assets and liabilities are recognized for the expected tax consequences of temporary differences between the tax bases of assets and liabilities and their reported amounts. The Company periodically assesses the need to establish valuation allowances against its deferred tax assets to the extent the Company no longer believes it is more likely than not that the tax assets will be fully utilized.

The Company evaluates a tax position to determine whether it is more likely than not that the tax position will be sustained upon examination, based upon the technical merits of the position. A tax position that meets the more-likely-than-not recognition threshold is subject to a measurement assessment to determine the amount of benefit to recognize and the appropriate reserve to establish, if any. If a tax position does not meet the more-likely-than-not recognition threshold, no benefit is recognized. The Company is periodically audited by U.S. federal and state as well as foreign tax authorities. While it is often difficult to predict final outcome or timing of resolution of any particular tax matter, the Company believes its reserve for uncertain tax positions is adequate to reduce the uncertain positions to the greatest amount of benefit that is more likely than not realizable.

Product Warranty Reserve - The Company accrues for the estimated cost of product warranties at the time revenue is recognized. Warranty obligations by product line or model are evaluated based on historical warranty claims experience. For equipment, the Company's standard product warranty terms generally include post-sales support and repairs of products at no additional charge for periods ranging from three months to two years or up to a specified number of hours of operation. For parts from component suppliers, the Company relies on the original manufacturer's warranty that accompanies those parts. Generally, Company fabricated parts are not covered by specific warranty terms. Although failure of fabricated parts due to material or workmanship is rare, if it occurs, the Company's policy is to replace fabricated parts at no additional charge.

The Company engages in extensive product quality programs and processes, including actively monitoring and evaluating the quality of our component suppliers. Estimated warranty obligations are based upon warranty terms, product failure rates, repair costs and current period machine shipments. If actual product failure rates, repair costs, service delivery costs or post-sales support costs differ from our estimates, revisions to the estimated warranty liability may be required.

Pension and Retirement Plans - The determination of obligations and expenses under the Company's pension plan is dependent on the Company's selection of certain assumptions used by independent actuaries in calculating such amounts. Those assumptions are described in Note 12, Pension and Retirement Plans and include among others, the discount rate, expected return on plan assets and the expected mortality rates. In accordance with U.S. generally accepted accounting principles, actual results that differ from assumptions are accumulated and amortized over future periods and, therefore, generally affect the recognized expense in such periods. Significant differences in actual experience or significant changes in the assumptions used may materially affect the pension obligations and future expenses.

The Company recognizes the overfunded or underfunded status of its pension plan as an asset or liability. Actuarial gains and losses, amortization of prior service cost (credit) and amortization of transition obligations are recognized through other comprehensive income (loss) in the year in which the changes occur. The Company measures the funded status of its pension plan as of the date of the Company's fiscal year-end.

Stock-based Compensation - The Company recognizes the cost of employee and director services received in exchange for equity awards in the consolidated financial statements based on the grant date calculated fair value of the awards. The Company recognizes stock-based compensation expense over the period during which a recipient is required to provide service in exchange for the award (the vesting period). The Company's equity awards are further described in Note 16, Shareholders' Equity.

Earnings Per Share - Basic earnings (loss) per share is based on the weighted average number of common shares outstanding and diluted earnings (loss) per share includes potential dilutive effects of restricted stock units and shares held in the Company's supplemental executive retirement plan.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The following table sets forth a reconciliation of the number of shares used in the computation of basic and diluted earnings (loss) per share:

	Year Ended December 31		
	2018	2017	2016
Denominator:			
Denominator for basic earnings (loss) per share	22,902	23,025	22,992
Effect of dilutive securities:			
Restricted stock units	--	96	85
Supplemental executive retirement plan	--	63	65
Denominator for diluted earnings (loss) per share	22,902	23,184	23,142

Derivatives and Hedging Activities - The Company recognizes all derivatives in the consolidated balance sheets at their fair value. Derivatives that are not hedges are adjusted to fair value through income. If the derivative is a hedge, depending on the nature of the hedge, changes in the fair value of derivatives are either offset against the change in fair value of assets, liabilities, or firm commitments through income or recognized in other comprehensive income (loss) until the hedged item is recognized in income. The ineffective portion of a derivative's change in fair value is immediately recognized in income. From time to time, the Company's foreign subsidiaries enter into foreign currency exchange contracts to mitigate exposure to fluctuation in currency exchange rates. See Note 13, Derivative Financial Instruments, regarding foreign exchange contracts outstanding at December 31, 2018 and 2017.

Business Combinations - The Company accounts for business combinations using the acquisition method. Accordingly, intangible assets are recorded apart from goodwill if they arise from contractual or legal rights or if they are separable from goodwill. Related third-party acquisition costs are expensed as incurred and contingent consideration is booked at its fair value as part of the purchase price. See Note 21, Business Combinations, regarding acquisitions completed by the Company in the years ended December 31, 2017 and 2016.

Subsequent Events Review - Management has evaluated events occurring between December 31, 2018 and the date these consolidated financial statements were filed with the Securities and Exchange Commission for proper recording or disclosure therein.

Recent Accounting Pronouncements - In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2014-09, "Revenue from Contracts with Customers", which supersedes existing revenue guidance under U.S. GAAP. The standard's core principle is that a company will recognize revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. Certain provisions of the standard were clarified in March 2016 with the issuance of ASU No. 2016-08, "Revenue from Contracts with Customers (Topic 606)", which provided additional implementation guidance in order to eliminate the potential for diversity in practice arising from inconsistent application of the principal versus agent guidance. Under the new guidance, when an entity determines it is a principal in a transaction, the entity recognizes revenue in the gross amount of consideration; however, in transactions where an entity determines it is an agent, the entity recognizes revenue in the amount of any fee or commission to which it expects to be entitled. These new standards require companies to use more judgment and to make more estimates than under previous guidance and expand required disclosures to include information regarding contract assets and liabilities as well as a more disaggregated view of revenue. The standards are effective for public companies for annual periods beginning after December 15, 2017 and, as such, the Company adopted the new standards effective January 1, 2018, using the modified retrospective transition method. See Note 17, Revenue Recognition, for additional disclosures required by the standards. The adoption of the standards did not have a material impact on the Company's financial position, results of operations or cash flows, and no cumulative effect adjustment to retained earnings was recorded.

In January 2016, the FASB issued ASU No. 2016-01, "Financial Instruments - Overall (Subtopic 825-10)", which requires, among other things, equity investments with readily determinable fair values, except those accounted for under the equity method of accounting or those that result in consolidation of the investee, to be measured at fair value with changes in fair value recognized in net income. The new standard was further clarified by the issuance of ASU No. 2018-03, "Technical Corrections and Improvements to Financial Instruments - Overall (Subtopic 825-10), Recognition and Measurement of Financial Assets and Financial Liabilities" in February 2018. The standards are effective for public companies in fiscal years beginning after December 15, 2017, and the Company adopted the standard effective January 1, 2018. The adoption of these standards did not have a material impact on the Company's financial position, results of operations or cash flows.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

In February 2016, the FASB issued ASU No. 2016-02, "Leases (Topic 842)", which significantly changes the accounting for operating leases by lessees. The accounting applied by lessors is largely unchanged from that applied under previous guidance. The new guidance establishes a right-of-use ("ROU") model and requires lessees to recognize lease assets and lease liabilities in the balance sheet, initially measured at the present value of the lease payments, for leases which were classified as operating leases under previous guidance. Lease cost included in the statement of operations will be calculated so that the cost of the lease is allocated over the lease term, generally on a straight-line basis. The Company has made an accounting policy election to exclude leases with a term of 12 months or less from the requirement to record related assets and liabilities. Certain provisions of ASU No. 2016-02 were later modified or clarified by the issuance of ASU 2018-11, "Leases (Topic 842): Targeted Improvements" and ASU 2018-10, "Codification Improvements to Topic 842, Leases". A modified retrospective transition approach is required by the ASU and its provisions must be applied to all leases existing at the date of initial application. An entity may choose to use either (1) the standard's effective date or (2) the beginning of the earliest comparative period presented in the financial statements as its date of initial application. The new standards are effective for public companies for fiscal years beginning after December 15, 2018. The Company adopted the new standards effective January 1, 2019 using the effective date as the date of initial application. Consequently, financial information will not be updated and the disclosures required under the new standards will not be provided for periods before January 1, 2019. The standards provide a number of optional practical expedients in transition which the Company is continuing to evaluate. The Company does not expect the adoption of these standards to have a material impact on its results of operations or cash flows; however, the Company continues to evaluate the impact the adoption of the new standards will have on its financial position. While the Company continues to assess all of the effects of adoption, it currently believes the most significant effects relate to the recognition of new ROU assets and lease liabilities on its consolidated balance sheet for its operating leases and new disclosures about its leasing activities.

In June 2016, the FASB issued ASU No. 2016-13, "Financial Instruments – Credit Losses (Topic 326), Measurement of Credit Losses on Financial Instruments". The standard changes how credit losses are measured for most financial assets and certain other instruments that currently are not measured through net income. The standard will require an expected loss model for instruments measured at amortized cost as opposed to the current incurred loss approach. In valuing available for sale debt securities, allowances will be required to be recorded, rather than the current approach of reducing the carrying amount, for other than temporary impairments. A cumulative adjustment to retained earnings is to be recorded as of the beginning of the period of adoption to reflect the impact of applying the provisions of the standard. The standard is effective for public companies for periods beginning after December 15, 2019 and the Company expects to adopt the new standard as of January 1, 2020. The Company has not yet determined what impact, if any, the adoption of this new standard will have on the Company's financial position, results of operations or cash flows.

In August 2016, the FASB issued ASU No. 2016-15, "Statement of Cash Flows (Topic 230), Classification of Certain Cash Receipts and Cash Payments (a consensus of the Emerging Issues Task Force)" which clarifies how certain cash receipts and cash payments should be presented on the statement of cash flows. The statement also addresses how the predominance principle should be applied when cash payments have aspects of more than one class of cash flows. The standard is effective for public companies in fiscal years beginning after December 15, 2017, and the Company adopted the standard effective January 1, 2018. The adoption of this standard did not have a material impact on the Company's consolidated statements of cash flows.

In October 2016, the FASB issued ASU No. 2016-16, "Income Taxes (Topic 740), Intra-Entity Transfers of Assets Other Than Inventory" which requires companies to account for the income tax effects of intercompany sales and transfers of assets other than inventory, such as intangible assets, when the transfer occurs. This is a change from previous guidance, which required companies to defer the income tax effects of intercompany transfers of assets until the asset has been sold to an outside party or otherwise recognized by being depreciated, amortized, or impaired. The new guidance requires companies to defer the income tax effects of only intercompany transfers of inventory. The standard is effective for public companies in fiscal years beginning after December 15, 2017. The Company adopted the new standard effective January 1, 2018. The application of this standard did not have a material impact on the Company's financial position, results of operations or cash flows.

In January 2017, the FASB issued ASU No. 2017-01, "Business Combinations (Topic 805), Clarifying the Definition of a Business," which provides additional guidance to assist entities with evaluating whether transactions should be accounted for as acquisitions (or disposals) of assets or businesses. The standard is effective for public companies for annual or interim periods beginning after December 15, 2017. The Company adopted the new standard effective January 1, 2018. The application of this standard did not have a material impact on the Company's financial position, results of operations or cash flows.

In August 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815), Targeted Improvements to Hedging Activities", to improve the financial reporting of hedging relationships to better portray the economic results of an entity's risk management activities in its financial statements. The new guidance is effective for public

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

companies for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years with early adoption permitted in any interim period after its issuance. The Company adopted the new standard effective January 1, 2019. The Company does not expect the application of this standard to have a material impact on its financial position, results of operations or cash flows.

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", which permits companies to reclassify tax effects stranded in accumulated other comprehensive income ("OCI") as a result of tax reform impacting tax rates or other items, such as changing from a worldwide tax system to a territorial system, from OCI to retained earnings. Other tax effects stranded in OCI due to other reasons, such as prior changes in tax laws or changes in valuation allowances, may not be reclassified. Additional disclosures will also be required upon adoption of the new standard. The new standard is effective for fiscal years beginning after December 15, 2018, with early adoption permitted. The Company adopted this new standard effective January 1, 2019. The Company does not expect the adoption of this standard to have a material impact on its financial position, results of operations or cash flows.

In March 2018, the FASB issued ASU No. 2018-05 "Income Taxes (Topic 740), amendments to SEC Paragraphs Pursuant to SEC Staff Accounting Bulletin No. 118 (SEC Update)", which addresses the accounting and disclosures around the enactment of the Tax Cuts and Jobs Act and the Securities and Exchange Commission's Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act ("SAB 118"). The Company adopted this new standard in the first quarter of 2018. See Note 14, Income Taxes, for the disclosures related to this amended guidance.

In August 2018, the FASB issued ASU No. 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement" which aims to improve the overall usefulness of disclosures to financial statement users and reduce unnecessary costs to companies when preparing fair value measurement disclosures. The standard is effective for annual and interim periods beginning after December 15, 2019 with early adoption permitted. The Company expects to adopt this new standard effective January 1, 2020. The Company does not expect the adoption of this new standard to have a material impact on its financial position, results of operations or cash flows.

2. Inventories

Inventories consist of the following:

	December 31	
	2018	2017
Raw materials and parts	\$ 173,919	\$ 146,144
Work-in-process	69,718	129,441
Finished goods	89,152	94,571
Used equipment	23,155	21,223
Total	\$ 355,944	\$ 391,379

3. Fair Value Measurements

The Company has various financial instruments that must be measured at fair value on a recurring basis, including marketable debt and equity securities held by Astec Insurance, and marketable equity securities held in an unqualified Supplemental Executive Retirement Plan ("SERP"). The financial assets held in the SERP also constitute a liability of the Company for financial reporting purposes. The Company's subsidiaries also occasionally enter into foreign currency exchange contracts to mitigate exposure to fluctuations in currency exchange rates.

For cash and cash equivalents, trade receivables, other receivables and accounts payable, the carrying amount approximates the fair value because of the short-term nature of these instruments. Investments are carried at their fair value based on quoted market prices for identical or similar assets or, where no quoted prices exist, other observable inputs for the asset. The fair values of foreign currency exchange contracts are based on quotations from various banks for similar instruments using models with market based inputs.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

As indicated in the tables below, the Company has determined that its financial assets and liabilities at December 31, 2018 and 2017 are level 1 and level 2 in the fair value hierarchy:

December 31, 2018			
	Level 1	Level 2	Total
Financial Assets:			
Trading equity securities:			
SERP money market fund	\$ 229	\$ --	\$ 229
SERP mutual funds	4,755	--	4,755
Preferred stocks	248	--	248
Trading debt securities:			
Corporate bonds	5,398	--	5,398
Municipal bonds	--	1,546	1,546
Floating rate notes	1,300	--	1,300
U.S. Treasury bills	2,210	--	2,210
Asset-backed securities	--	442	442
Other	--	708	708
Derivative financial instruments	--	333	333
Total financial assets	\$ 14,140	\$ 3,029	\$ 17,169
Financial Liabilities:			
SERP liabilities	\$ --	\$ 6,641	\$ 6,641
Total financial liabilities	\$ --	\$ 6,641	\$ 6,641

December 31, 2017			
	Level 1	Level 2	Total
Financial Assets:			
Trading equity securities:			
SERP money market fund	\$ 124	\$ --	\$ 124
SERP mutual funds	4,839	--	4,839
Preferred stocks	364	--	364
Trading debt securities:			
Corporate bonds	5,661	--	5,661
Municipal bonds	--	1,912	1,912
Floating rate notes	753	--	753
U.S. Treasury bills	1,030	--	1,030
Asset-backed securities	--	526	526
Other	--	968	968
Total financial assets	\$ 12,771	\$ 3,406	\$ 16,177
Financial Liabilities:			
SERP liabilities	\$ --	\$ 8,552	\$ 8,552
Derivative financial instruments	--	112	112
Total financial liabilities	\$ --	\$ 8,664	\$ 8,664

The Company reevaluates the volume of trading activity for each of its investments at the end of each reporting period and adjusts the level within the fair value hierarchy as needed.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

4. Investments

The Company's trading securities consist of the following:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value (Net Carrying Amount)
December 31, 2018				
Trading equity securities	\$ 5,546	\$ 50	\$ 365	\$ 5,231
Trading debt securities	11,817	55	267	11,605
Total	\$ 17,363	\$ 105	\$ 632	\$ 16,836
December 31, 2017				
Trading equity securities	\$ 4,964	\$ 394	\$ 31	\$ 5,327
Trading debt securities	10,971	58	179	10,850
Total	\$ 15,935	\$ 452	\$ 210	\$ 16,177

Trading equity investments are valued at their estimated fair value based on their quoted market prices and trading debt securities are valued based upon a mix of observable market prices and model driven prices derived from a matrix of observable market prices for assets with similar characteristics obtained from a nationally recognized third-party pricing service. Additionally, a significant portion of the trading equity securities are in equity money market and mutual funds and also comprise a portion of the Company's liability under its SERP. See Note 12, Pension and Retirement Plans, for additional information on these investments and the SERP.

Trading debt securities are comprised mainly of marketable debt securities held by Astec Insurance. Astec Insurance has an investment strategy that focuses on providing regular and predictable interest income from a diversified portfolio of high-quality fixed income securities.

5. Goodwill

Goodwill represents the excess of the purchase price over the fair value of identifiable net assets acquired in business combinations. Current U.S. accounting guidance provides that goodwill and indefinite-lived intangible assets be tested for impairment at least annually. The Company performs the required valuation procedures each year as of December 31 after the following year's forecasts are submitted and reviewed.

Goodwill impairment is the excess of the carrying amount of a reporting unit (that includes goodwill) over its fair value. Impairment is limited to the carrying amount of goodwill allocated to the reporting unit. The Company estimated the fair value of its reporting units as of December 31, 2018 based upon a combination of discounted cash flows and market approaches. Weighted average cost of capital assumptions used in the calculations ranged from 23.9% to 25.8% and terminal growth rate of 3% was also assumed. The sum of the reporting units valuations determined by the Company was reconciled to the Company's overall market capitalization. The valuations performed in the fourth quarter of 2018 indicated impairment in the amount of \$11,190 in two of the Company's reporting units in the Energy Group. The valuations performed in 2017 and 2016 indicated no impairment of goodwill. In addition, as part of a business unit restructuring, additional goodwill of \$955 was written off.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The changes in the carrying amount of goodwill and accumulated impairment losses by reporting segment during the years ended December 31, 2018 and 2017 are as follows:

	Infrastructure Group	Aggregate and Mining Group	Energy Group	Total
Balance, December 31, 2016:				
Goodwill	\$ 10,758	\$ 31,920	\$ 19,369	\$ 62,047
Accumulated impairment	(2,310)	(12,196)	(6,737)	(21,243)
Net	8,448	19,724	12,632	40,804
Acquisition	--	--	3,488	3,488
Foreign currency translation	125	1,315	--	1,440
Balance, December 31, 2017:				
Goodwill	10,883	33,235	22,857	66,975
Accumulated impairment losses	(2,310)	(12,196)	(6,737)	(21,243)
Net	8,573	21,039	16,120	45,732
Restructuring write off	(955)	--	--	(955)
Foreign currency translation	(49)	(790)	--	(839)
Impairment	--	--	(11,190)	(11,190)
Balance, December 31, 2018:				
Goodwill	9,879	32,445	22,857	65,181
Accumulated impairment	(2,310)	(12,196)	(17,927)	(32,433)
Net	\$ 7,569	\$ 20,249	\$ 4,930	\$ 32,748

6. Intangible Assets

Intangible assets consisted of the following at December 31, 2018 and 2017:

	2018			2017		
	Gross Carrying Value	Accumulated Amortization	Net Carrying Value	Gross Carrying Value	Accumulated Amortization	Net Carrying Value
Dealer network and customer relationships	\$ 30,909	\$ 14,472	\$ 16,437	\$ 31,376	\$ 10,856	\$ 20,520
Trade names	9,536	2,509	7,027	9,650	1,914	7,736
Other	6,618	4,712	1,906	6,821	4,125	2,696
Total	\$ 47,063	\$ 21,693	\$ 25,370	\$ 47,847	\$ 16,895	\$ 30,952

Amortization expense on intangible assets was \$5,125, \$4,064 and \$3,562 for 2018, 2017 and 2016, respectively. Intangible asset amortization expense is expected to be \$3,944, \$3,511, \$3,118, \$2,660 and \$2,178 in the years ending December 31, 2019, 2020, 2021, 2022 and 2023, respectively, and \$9,959 thereafter.

7. Property and Equipment

Property and equipment at cost, less accumulated depreciation, is as follows:

	December 31	
	2018	2017
Land	\$ 15,774	\$ 15,568
Building and land improvements	145,913	143,339
Construction in progress	10,410	10,680
Manufacturing and office equipment	260,420	244,324
Aviation equipment	14,424	14,227
Less accumulated depreciation	(254,493)	(237,742)
Total	\$ 192,448	\$ 190,396

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Depreciation expense was \$22,411, \$21,312 and \$20,818 for the years ended December 31, 2018, 2017 and 2016, respectively.

8. Leases

The Company leases certain land, buildings and equipment for use in its operations under various operating leases. Total rental expense charged to operations under operating leases was approximately \$3,618, \$3,211 and \$2,792 for the years ended December 31, 2018, 2017 and 2016, respectively.

Minimum rental commitments for all noncancelable operating leases at December 31, 2018 are as follows:

2019	\$	1,992
2020		1,100
2021		388
2022		144
2023		66
Thereafter		12
	\$	<u>3,702</u>

9. Debt

On April 12, 2017, the Company and certain of its subsidiaries entered into an amended and restated credit agreement whereby the lender extended to the Company an unsecured line of credit of up to \$100,000, including a sub-limit for letters of credit of up to \$30,000. As of December 31, 2018, outstanding borrowings under the agreement totaled \$58,778, which are included in long-term debt in the accompanying consolidated balance sheets. No amounts were outstanding at December 31, 2017 under the agreement. Letters of credit totaling \$11,044, including \$3,200 of letters of credit issued to banks in Brazil to secure the local debt of Astec do Brasil Fabricacao de Equipamentos Ltda. ("Astec Brazil"), were outstanding under the credit facility as of December 31, 2018, resulting in additional borrowing ability of \$30,178 under the credit facility. The credit agreement has a five-year term expiring in April 2022. Borrowings under the agreement are subject to an interest rate equal to the daily one-month LIBOR rate plus a 0.75% margin, resulting in a rate of 3.27% as of December 31, 2018. The unused facility fee is 0.125%. Interest only payments are due monthly. The amended and restated credit agreement contains certain financial covenants, including provisions concerning required levels of annual net income and minimum tangible net worth.

In February 2019, the \$100,000 amended and restated credit agreement discussed above was again amended to increase the unsecured line of credit to a maximum of \$150,000 and to extend the maturity date of the agreement to December 29, 2023. Upon disposition of the Georgia wood pellet plant, the Company is required to apply the proceeds, if any, as a payment against any outstanding balance on the line of credit. Other significant terms were left unchanged.

The Company's South African subsidiary, Osborn Engineered Products SA (Pty) Ltd ("Osborn"), has a credit facility of \$6,600 with a South African bank to finance short-term working capital needs, as well as to cover performance letters of credit, advance payment and retention guarantees. As of December 31, 2018 and 2017, Osborn had no outstanding borrowings but had \$397 in performance, advance payment and retention guarantees outstanding under the facility at December 31, 2018. The facility has been guaranteed by Astec Industries, Inc., but is otherwise unsecured. A 0.75% unused facility fee is charged if less than 50% of the facility is utilized. As of December 31, 2018, Osborn had available credit under the facility of \$6,203. The interest rate is 0.25% less than the South Africa prime rate, resulting in a rate of 10.0% as of December 31, 2018.

The Company's Brazilian subsidiary has outstanding working capital loans totaling \$1,207 and \$3,402 from Brazilian banks with interest rates ranging from 10.4% to 11.0% at December 31, 2018 and 2017, respectively. The loans' maturity dates ranging from January 2019 to April 2024 and are secured by Astec Brazil's manufacturing facility and also by letters of credit totaling \$3,200 issued by Astec Industries, Inc. Additionally, Astec Brazil has various five-year equipment financing loans outstanding with Brazilian banks in the aggregate of \$137 and \$642 as of December 31, 2018 and 2017, respectively, that have interest rates ranging from 3.5% to 16.3%. These equipment loans have maturity dates ranging from January 2019 to April 2020. Astec Brazil's loans are included in the accompanying consolidated balance sheets as current maturities of long-term debt of \$413 and long-term debt of \$931 as of December 31, 2018.

Long-term debt maturities are expected to be \$413, \$217, \$214, \$58,992 and \$214 in the years ending December 31, 2019, 2020, 2021, 2022 and 2023, respectively, and \$72 thereafter.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

10. Product Warranty Reserves

The Company warrants its products against manufacturing defects and performance to specified standards. The warranty period and performance standards vary by product, but generally range from three months to two years or up to a specified number of hours of operation. The Company estimates the costs that may be incurred under its warranties and records a liability at the time product sales are recorded. The warranty liability is primarily based on historical claim rates, nature of claims and the associated costs.

Changes in the Company's product warranty liability during 2018, 2017 and 2016 are as follows:

	2018	2017	2016
Reserve balance, beginning of year	\$ 15,410	\$ 13,156	\$ 9,100
Warranty liabilities accrued	13,219	16,725	18,912
Warranty liabilities settled	(17,539)	(14,642)	(15,125)
Other	(162)	171	269
Reserve balance, end of year	\$ 10,928	\$ 15,410	\$ 13,156

11. Accrued Loss Reserves

The Company accrues reserves for losses related to known workers' compensation and general liability claims that have been incurred but not yet paid or are estimated to have been incurred but not yet reported to the Company. The undiscounted reserves are actuarially determined based on the Company's evaluation of the type and severity of individual claims and historical information, primarily its own claim experience, along with assumptions about future events. Changes in assumptions, as well as changes in actual experience, could cause these estimates to change in the future. Total accrued loss reserves at December 31, 2018 were \$8,261 and \$8,119 at December 31, 2017, of which \$6,429 and \$5,615 were included in other long-term liabilities at December 31, 2018 and 2017, respectively.

12. Pension and Retirement Plans

Prior to December 31, 2003, all employees of the Company's Kolberg-Pioneer, Inc. subsidiary were covered by a defined benefit pension plan. After December 31, 2003, all benefit accruals under the plan ceased and no new employees could become participants in the plan. Benefits paid under this plan are based on years of service multiplied by a monthly amount. The Company's funding policy for the plan is to make at least the minimum annual contributions required by applicable regulations.

The Company's investment strategy for the plan is to earn a rate of return sufficient to match or exceed the long-term growth of pension liabilities. The investment policy states that the Plan Committee in its sole discretion shall determine the allocation of plan assets among the following four asset classes: cash equivalents, fixed-income securities, domestic equities and international equities. The Plan Committee attempts to ensure adequate diversification of the invested assets through investment in an exchange traded mutual fund that invests in a diversified portfolio of stocks, bonds and money market securities.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The following provides information regarding benefit obligations, plan assets and the funded status of the plan:

	Pension Benefits	
	2018	2017
Change in benefit obligation		
Benefit obligation, beginning of year	\$ 16,916	\$ 16,104
Interest cost	578	630
Actuarial (gain)/loss	(1,021)	867
Benefits paid	(732)	(685)
Benefit obligation, end of year	15,741	16,916
Accumulated benefit obligation	15,741	16,916
Change in plan assets		
Fair value of plan assets, beginning of year	14,717	13,241
Actual gain/(loss) on plan assets	(909)	1,746
Employer contribution	1,376	415
Benefits paid	(732)	(685)
Fair value of plan assets, end of year	14,452	14,717
Funded status, end of year	\$ (1,289)	\$ (2,199)
Amounts recognized in the consolidated balance sheets		
Noncurrent liabilities	\$ (1,289)	\$ (2,199)
Net amount recognized	\$ (1,289)	\$ (2,199)
Amounts recognized in accumulated other comprehensive loss consist of		
Net loss	\$ 5,687	\$ 5,463
Net amount recognized	\$ 5,687	\$ 5,463
Weighted average assumptions used to determine benefit obligations as of December 31		
Discount rate	4.10%	3.50%
Expected return on plan assets	6.00%	6.25%
Rate of compensation increase	N/A	N/A

The measurement date used for the plan was December 31. In determining the expected return on plan assets, the historical experience of the plan assets, the current and expected allocation of the plan assets and the expected long-term rates of return were considered.

All assets in the plan are invested in an exchange traded mutual fund (level 1 in the fair value hierarchy). The allocation of assets within the mutual fund as of December 31 and the target asset allocation ranges by asset category are as follows:

Asset Category	Actual Allocation		2018 & 2017 Target Allocation Ranges
	2018	2017	
Equity securities	46.9%	49.4%	40 - 65%
Debt securities	46.2%	43.2%	30 - 50%
Cash and equivalents	6.9%	7.4%	0 - 15%
Total	100.0%	100.0%	

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Net periodic benefit cost for 2018, 2017 and 2016 included the following components:

	Pension Benefits		
	2018	2017	2016
Components of net periodic benefit cost			
Interest cost	\$ 578	\$ 630	\$ 650
Expected return on plan assets	(802)	(720)	(782)
Amortization of actuarial loss	465	530	480
Net periodic benefit cost	241	440	348
Other changes in plan assets and benefit obligations recognized in other comprehensive income			
Net actuarial (gain) loss for the year	690	(159)	533
Amortization of net loss	(465)	(530)	(480)
Total recognized in other comprehensive income	225	(689)	53
Total recognized in net periodic benefit cost and other comprehensive income	466	(249)	401
Weighted average assumptions used to determine net periodic benefit cost for years ended December 31			
Discount rate	3.50%	4.00%	4.28%
Expected return on plan assets	6.25%	6.25%	7.00%

No contributions are expected to be funded by the Company during 2019.

Amounts in accumulated other comprehensive loss expected to be recognized in net periodic benefit cost in 2019 for the amortization of a net loss is \$520.

The following estimated future benefit payments are expected in the years indicated:

	Pension Benefits
2019	\$ 840
2020	870
2021	910
2022	920
2023	940
2024 - 2028	4,920

The Company sponsors a 401(k) defined contribution plan to provide eligible employees with additional income upon retirement. The Company's contributions to the plan are based on employee contributions. The Company's contributions totaled \$7,451, \$7,182 and \$5,943 in 2018, 2017 and 2016, respectively.

The Company maintains a SERP for certain of its executive officers. The plan is a non-qualified deferred compensation plan administered by the Board of Directors of the Company, pursuant to which the Company makes quarterly cash contributions of a certain percentage of executive officers' compensation. Investments are self-directed by participants and can include Company stock. Upon retirement, participants receive their apportioned share of the plan assets in the form of cash.

Assets of the SERP consist of the following:

	December 31, 2018		December 31, 2017	
	Cost	Market	Cost	Market
Company stock	\$ 1,886	\$ 1,658	\$ 1,960	\$ 3,589
Equity securities	5,262	4,983	4,589	4,963
Total	\$ 7,148	\$ 6,641	\$ 6,549	\$ 8,552

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

At the end of each quarter, the Company adjusts the deferred compensation liability such that the balance of the liability equals the total fair market value of all assets held by the trust established under the SERP. Such liabilities are included in other long-term liabilities on the consolidated balance sheets. The equity securities are included in investments in the consolidated balance sheets and classified as trading equity securities. See Note 4, Investments, for additional information. The cost of the Company stock held by the plan is included as a reduction in shareholders' equity in the consolidated balance sheets.

The change in the fair market value of Company stock held in the SERP results in a charge or credit to selling, general and administrative expenses in the consolidated statements of operations because the acquisition cost of the Company stock in the SERP is recorded as a reduction of shareholders' equity and is not adjusted to fair market value; however, the related liability is adjusted to the fair market value of the stock as of each period end. The Company recognized income of \$1,556 and \$575 in 2018 and 2017, respectively, and expense of \$1,742 in 2016, related to the change in the fair value of the Company stock held in the SERP.

13. Derivative Financial Instruments

The Company is exposed to certain risks relating to its ongoing business operations. The primary risk managed by using derivative instruments is foreign currency risk. From time to time, the Company's foreign subsidiaries enter into foreign currency exchange contracts to mitigate exposure to fluctuations in currency exchange rates. The fair value of the derivative financial instrument is recorded on the Company's balance sheet and is adjusted to fair value at each measurement date. The changes in fair value are recognized in the consolidated statements of operations in the current period. The Company does not engage in speculative transactions nor does it hold or issue derivative financial instruments for trading purposes. The average U.S. dollar equivalent notional amount of outstanding foreign currency exchange contracts was \$11,082 during 2018. At December 31, 2018, the Company reported \$333 of derivative assets in other current assets. The Company reported \$112 of derivative liabilities in other current liabilities at December 31, 2017. The Company recognized, as a component of cost of sales, a net gain on the change in fair value of derivative instruments of \$1,147 for the year ended December 31, 2018. The Company recognized net losses on the change in fair value of derivative instruments of \$663 and \$336 for the years ended December 31, 2017 and 2016, respectively. There were no derivatives that were designated as hedges at December 31, 2018 or 2017.

14. Income Taxes

For financial reporting purposes, income (loss) before income taxes includes the following components:

Year Ended December 31			
	2018	2017	2016
United States	\$ (86,874)	\$ 55,980	\$ 87,326
Foreign	896	1,237	(231)
Income (loss) before income taxes	\$ (85,978)	\$ 57,217	\$ 87,095

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The provision (benefit) for income taxes consists of the following:

	Year Ended December 31		
	2018	2017	2016
Current provision (benefit):			
Federal	\$ (3,995)	\$ 16,178	\$ 30,623
State	892	2,866	4,098
Foreign	3,254	874	907
Total current provision	151	19,918	35,628
Deferred provision (benefit):			
Federal	(19,142)	107	(2,653)
State	(5,788)	(455)	(1,213)
Foreign	(455)	57	345
Total deferred benefit	(25,385)	(291)	(3,521)
Total provision (benefit):			
Federal	(23,137)	16,285	27,970
State	(4,896)	2,411	2,885
Foreign	2,799	931	1,252
Total income tax provision (benefit)	\$ (25,234)	\$ 19,627	\$ 32,107

The Company's income tax provision (benefit) is computed based on the domestic and foreign federal statutory rates and the average state statutory rates, net of related federal benefit.

The provision (benefit) for income taxes differs from the amount computed by applying the statutory federal income tax rate to income (loss) before income taxes. A reconciliation of the provision (benefit) for income taxes at the statutory federal income tax rate to the amount provided is as follows:

	Year Ended December 31		
	2018	2017	2016
Tax expense (benefit) at the statutory federal income tax rate	\$ (18,055)	\$ 20,026	\$ 30,483
Domestic production activity deduction	--	(1,661)	(1,641)
State income tax, net of federal income tax	(2,976)	1,520	1,876
Research and development tax credits	(4,660)	(922)	(785)
FIN 48 impact	1,856	124	(240)
Liquidation of subsidiary	(1,403)	--	--
Valuation allowance impact	978	1,585	1,638
U.S. tax reform impact	(193)	(505)	--
Other items	(781)	(540)	776
Total income tax provision (benefit)	\$ (25,234)	\$ 19,627	\$ 32,107

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Significant components of the Company's deferred tax assets and liabilities are as follows:

	December 31	
	2018	2017
Deferred tax assets:		
Inventory reserves	\$ 4,513	\$ 4,287
Warranty reserves	2,275	3,560
Bad debt reserves	182	299
State tax loss carryforwards	7,265	2,710
Accrued vacation	1,612	1,712
SERP	364	367
Deferred compensation	881	1,293
Restricted stock units	1,728	1,664
Goodwill	2,157	--
Pension and post-employment benefits	1,536	1,448
Outside basis difference	4,496	--
Federal net operating loss	15,655	--
Foreign net operating losses	5,069	6,310
Other	5,025	2,478
Valuation allowances	(8,540)	(8,318)
Total deferred tax assets	44,218	17,810
Deferred tax liabilities:		
Property and equipment	16,156	14,562
Intangibles	541	769
Goodwill	--	654
Pension	1,051	758
Total deferred tax liabilities	17,748	16,743
Total net deferred assets	\$ 26,470	\$ 1,067

As of December 31, 2018, the Company has a federal net operating loss carryforward of \$74,548 from year 2018. The Company expects to utilize the 2018 federal net operating loss against earnings in future years.

As of December 31, 2018, the Company has state net operating loss carryforwards of \$261,673 and foreign net operating loss carryforwards of approximately \$16,759, which will be available to offset future taxable income. If not used, these carryforwards will expire between 2019 and 2030. A significant portion of the valuation allowance for deferred tax assets relates to the future utilization of state and foreign net operating loss and state tax credit carryforwards. Future utilization of these net operating loss and state tax credit carryforwards is evaluated by the Company on a periodic basis and the valuation allowance is adjusted accordingly. In 2018, the valuation allowance on these carryforwards was increased by \$978 due to the unrealizable portion of certain entities' state and foreign net operating loss carryforwards. The Company has also determined that the recovery of certain other deferred tax assets is realizable. The valuation allowance for these deferred tax assets was decreased by \$756 during 2018.

The following table represents a roll forward of the deferred tax asset valuation allowance for the years ended December 31, 2018, 2017 and 2016:

	Year Ended December 31		
	2018	2017	2016
Allowance balance, beginning of year	\$ 8,318	\$ 8,280	\$ 8,065
Provision	978	1,585	1,639
Write-offs	--	(1,862)	(289)
Other	(756)	315	(1,135)
Allowance balance, end of year	\$ 8,540	\$ 8,318	\$ 8,280

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Undistributed earnings of the Company's Canadian subsidiary, Breaker Technology Ltd. ("BTL"), South African subsidiary, Osborn Engineered Products SA, (Pty), Ltd. ("Osborn"), Australian subsidiary, Astec Australia Pty, Ltd. ("Astec Australia"), and Northern Ireland subsidiary, Telestack Limited ("Telestack"), are considered to be indefinitely reinvested; accordingly, no provision for U.S. federal and state income taxes has been provided thereon. As of December 31, 2018, the cumulative amounts of undistributed GAAP earnings for BTL, Osborn, Astec Australia and Telestack are \$7,789, \$29,800, \$490 and \$1,477, respectively. A portion of these amounts may be subject to taxation under the one-time transition tax included in the Tax Cuts and Jobs Act of 2017. Based upon the provisions in the Tax Cuts and Jobs Act of 2017, any future qualified dividends out of these amounts will not be subject to U.S. income taxes. However, upon any future inclusion as Subpart F income or capital gains, the Company would be subject to additional U.S. income taxes (subject to an adjustment for foreign tax credits). Upon any repatriation, withholding taxes due to the foreign jurisdictions may have to be paid. At this time, it is not practicable to determine the amount of the unrecognized deferred tax liability for temporary differences related to investments in foreign subsidiaries.

The Company files income tax returns in the U.S. federal jurisdiction, and in various state and foreign jurisdictions. The Company is no longer subject to U.S. federal income tax examinations by authorities for years prior to 2014. With few exceptions, the Company is no longer subject to state and local or non-U.S. income tax examinations by authorities for years prior to 2013.

The Company has a liability for unrecognized tax benefits of \$2,048 and \$365 (excluding accrued interest and penalties) as of December 31, 2018 and 2017, respectively. The Company recognizes interest and penalties accrued related to unrecognized tax benefits in tax expense. The Company recognized tax benefits of \$66 and \$22 in 2018 and 2017, respectively, for penalties and interest related to amounts that were settled for less than previously accrued. The net total amount of unrecognized tax benefits that, if recognized, would affect the Company's effective tax rate is \$2,243 and \$370 at December 31, 2018 and 2017, respectively. The Company does not expect a significant increase or decrease to the total amount of unrecognized tax benefits within the next twelve months.

A reconciliation of the beginning and ending unrecognized tax benefits excluding interest and penalties is as follows:

	Year Ended December 31		
	2018	2017	2016
Balance, beginning of year	\$ 365	\$ 238	\$ 603
Additions for tax positions taken in current year	1,722	127	235
Reductions due to lapse of statutes of limitations	(39)	--	(16)
Decreases related to settlements with tax authorities	--	--	(584)
Balance, end of year	\$ 2,048	\$ 365	\$ 238

The December 31, 2018 balance of unrecognized tax benefits includes no tax positions for which the ultimate deductibility is highly certain but the timing of such deductibility is uncertain. Accordingly, there is no impact to the deferred tax accounting for certain tax benefits.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (the "Tax Act") was signed into law making significant changes to the Internal Revenue Code. Changes include, but are not limited to, a federal corporate tax rate decrease from 35% to 21% for tax years beginning after December 31, 2017, the transition of U.S. international taxation from a worldwide tax system to a territorial system and a one-time transition tax on the mandatory deemed repatriation of foreign earnings. The Company's fourth quarter 2017 provision for income taxes was reduced by \$1,056, (comprised of a \$1,548 reduction in income tax expense recorded in connection with the remeasurement of deferred tax assets and liabilities and \$492 of additional income tax expense recorded in connection with the transition tax on the mandatory deemed repatriation of foreign earnings) due to applying the provisions of the Tax Act.

On December 22, 2017, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of U.S. GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. In accordance with SAB 118, the Company determined that the \$492 additional 2017 income tax expense was a provisional amount and constituted a reasonable estimate at December 31, 2017, based upon the best information then available. The final impact was \$1,727 and differed from the provisional amount due to, among other things, additional analysis, changes in interpretations and assumptions the Company made, additional regulatory guidance issued and actions the Company took as a result of the Tax Act. The subsequent adjustment, \$1,235, is included in 2018 income tax expense.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

While the Tax 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 recorded tax expense of \$545 in its consolidated financial statements for the year ended December 31, 2018.

The BEAT provisions in the Tax 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 to 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, 2018.

The changes to existing U.S. tax laws as a result of the Tax Act, which we believe have the most significant impact on the Company's federal income taxes are as follows:

Reduction of the U.S. Corporate Income Tax Rate: The Company measures deferred tax assets and liabilities using enacted tax rates that will apply in the years in which the temporary differences are expected to be recovered or paid. Accordingly, the Company recognized a deferred tax benefit and related increase in deferred tax assets of \$1,548 in its 2017 consolidated financial statements due to the remeasurement necessitated by the Tax Act's provision reducing the reduction in the U.S. corporate income tax rate from 35% to 21%. This benefit is attributable to the Company being in a net deferred tax liability position when considering only U.S. federal deferred items. The Company has significant deferred tax assets related to foreign jurisdictions and U.S. state income taxes.

Transition Tax on Foreign Earnings: The Company recognized a provisional income tax expense of \$492 for the year ended December 31, 2017 related to the one-time transition tax on certain foreign earnings. The final determination of the transition tax of \$1,727 was completed in 2018.

Repeal of Domestic Production Activities Deduction: While not effective until 2018, the Tax Act repeals the Domestic Production Activities Deduction ("DPAD") previously provided under IRC §199. The DPAD benefit has historically been material to the Company's federal income taxes. The DPAD benefits included in the effective tax rate reconciliations for 2017 and 2016 were \$1,661 and \$1,641, respectively.

15. Contingent Matters

Certain customers have financed purchases of Company products through arrangements in which the Company is contingently liable for customer debt of \$2,247 at December 31, 2018. These arrangements expire at various dates through July 2021 and provide that the Company will receive the lender's full security interest in the equipment financed if the Company is required to fulfill its contingent liability under these arrangements. The Company has recorded a liability of \$1,183 related to these guarantees as of December 31, 2018.

In addition, the Company is contingently liable under letters of credit issued by a lender totaling \$11,044 as of December 31, 2018, including \$3,200 of letters of credit guaranteeing certain Astec Brazil bank debt. The outstanding letters of credit expire at various dates through October 2020. As of December 31, 2018, the Company's foreign subsidiaries are contingently liable for a total of \$2,016 in performance letters of credit, advance payments and retention guarantees. The maximum potential amount of future payments under these letters of credit and guarantees for which the Company could be liable is \$13,060 as of December 31, 2018.

The Company manufactured its first wood pellet plant for a customer under a Company-financed arrangement whereby the Company deferred the recognition of revenue as payment under the arrangement was not assured. The original customer is attempting to obtain financing to purchase the plant at a reduced price; however, the Company believes the ultimate consummation of the sale to this customer is uncertain. After considering the uncertainty of completing the sale to the existing customer; the lack of success in attempting to market the plant to other pellet plant operators; the cost of repossessing the plant; and the Company's decision to exit the pellet plant business line, the pellet plant inventory's net realizable value has been written down to zero.

The Company and certain of its current and former executive officers have been named as defendants in a putative shareholder class action lawsuit filed on February 1, 2019, in the United States District Court for the Eastern District of Tennessee. The action is styled City of Taylor General Employees Retirement System v. Astec Industries, Inc., et al., Case No. 1:19-cv-00024-PLR-CHS. The complaint generally alleges that the defendants violated the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Rule 10b-5 promulgated thereunder by making allegedly false and misleading statements and that the individual defendants are control person under Section 20(a)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

of the Exchange Act. The complaint was filed on behalf of shareholders who purchased shares of the Company's stock between July 26, 2016 and October 22, 2018 and seeks monetary damages on behalf of the purported class. We dispute these allegations and intend to defend this lawsuit vigorously. The Company is unable to estimate the possible loss or range of loss at this time.

The Company is currently a party to various claims and legal proceedings that have arisen in the ordinary course of business. If management believes that a loss arising from such claims and legal proceedings is probable and can reasonably be estimated, the Company records the amount of the loss (excluding estimated legal fees) or the minimum estimated liability when the loss is estimated using a range and no point within the range is more probable than another. As management becomes aware of additional information concerning such contingencies, any potential liability related to these matters is assessed and the estimates are revised, if necessary. If management believes that a loss arising from such claims and legal proceedings is either (i) probable but cannot be reasonably estimated or (ii) reasonably possible but not probable, the Company does not record the amount of the loss, but does make specific disclosure of such matter. Based upon currently available information and with the advice of counsel, management believes that the ultimate outcome of its current claims and legal proceedings, individually and in the aggregate, will not have a material adverse effect on the Company's financial position, cash flows or results of operations. However, claims and legal proceedings are subject to inherent uncertainties and rulings unfavorable to the Company could occur. If an unfavorable ruling were to occur, there exists the possibility of a material adverse effect on the Company's financial position, cash flows or results of operations.

16. Shareholders' Equity

The Company rewards key members of management with restricted stock units ("RSUs") each year based upon the financial performance of the Company and its subsidiaries. Under the terms of the Company's shareholder-approved 2011 Incentive Plan, up to 700 shares of newly-issued Company stock is available for awards. Awards granted in 2016 and prior vest at the end of five years from the date of grant, or at the time a recipient retires after reaching age 65, if earlier, while awards granted after 2016 are scheduled to have a three-year vesting period. Additional RSUs are granted to the Company's outside directors under the Company's Non-Employee Directors Compensation Plan with a one-year vesting period. The fair value of the RSUs vested during 2018, 2017 and 2016 was \$1,869, \$1,991 and \$3,289, respectively. The grant date tax benefit was increased by \$67, \$290 and \$220, respectively, upon the vesting of RSUs in 2018, 2017 and 2016.

Compensation expense of \$2,032, \$2,978 and \$2,426 was recorded in the years ended December 31, 2018, 2017 and 2016, respectively, to reflect the fair value of RSUs granted (or anticipated to be granted for 2018 performance) amortized over the portion of the vesting period occurring during the period. Related income tax benefits of \$528, \$1,132 and \$934 were recorded in 2018, 2017 and 2016, respectively. Based upon the grant date fair value of RSUs, it is anticipated that \$3,022 of additional compensation costs will be recognized in future periods through 2022 for RSUs earned through December 31, 2018. The weighted average period over which this additional compensation cost will be expensed is 1.8 years. RSUs do not participate in Company-paid dividends.

Changes in restricted stock units during the year ended December 31, 2018 are as follows:

	2018	Weighted Average Grant Date Fair Value
Unvested restricted stock units, beginning of year	161	\$ 53.09
Units granted	61	58.45
Units forfeited	(25)	50.84
Units vested	(32)	45.79
Unvested restricted stock units, end of year	165	56.82

The grant date fair value of the restricted stock units granted during 2018, 2017 and 2016 was \$3,553, \$5,399 and \$1,946, respectively.

17. Revenue Recognition

As discussed in Note 1, Summary of Significant Accounting Policies, the Company adopted the provisions of ASU No. 2014-09, "Revenue from Contracts with Customers" and its related amendments effective January 1, 2018. The adoption of this standard did not have a material impact on the timing or amounts of revenues recognized by the Company, and, as such, no cumulative effect adjustment was recorded as of the adoption of the standard.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The following table disaggregates the Company's revenue by major source for the period ended December 31, 2018 (excluding intercompany sales):

	Infrastructure Group	Aggregate and Mining Group	Energy Group	Total
Net Sales - Domestic:				
Equipment sales	\$ 296,974	\$ 220,015	\$ 178,584	\$ 695,573
Pellet plant agreement sale reduction	(75,315)	--	--	(75,315)
Parts and component sales	119,823	71,862	42,666	234,351
Service and equipment installation revenue	10,822	1,844	6,355	19,021
Used equipment sales	8,098	3,127	4,358	15,583
Freight revenue	12,502	6,265	5,896	24,663
Other	1,022	(741)	1,657	1,938
Total domestic revenue	373,926	302,372	239,516	915,814
Net Sales - International:				
Equipment sales	43,516	98,604	24,308	166,428
Parts and component sales	19,215	44,609	10,528	74,352
Service and equipment installation revenue	3,152	1,069	390	4,611
Used equipment sales	1,693	2,948	908	5,549
Freight revenue	1,043	3,266	417	4,726
Other	(256)	296	79	119
Total international revenue	68,363	150,792	36,630	255,785
Total net sales	\$ 442,289	\$ 453,164	\$ 276,146	\$ 1,171,599

Revenue is recognized when obligations under the terms of a contract are satisfied and generally occurs with the transfer of control of the product or services at a point in time. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring goods or providing services. See Note 1, Summary of Significant Accounting Policies, for further information regarding the types and timing of the Company's revenue transactions. Contract assets and liabilities, excluding customer deposits, are immaterial at December 31, 2018.

The Company had a pellet plant sale which was accounted for over time using the ratio of costs incurred to estimated total costs. Pellet plant sales recognized under the over-time method in 2018 for production activities were not significant. Penalties are accounted for as a reduction in net sales. During July 2018, the Company entered into an agreement with its pellet plant customer due to unresolved issues which inhibited the plant's ability to meet contractual provisions by the date required in the Company's sales contract with its customer. Under the terms of the pellet plant agreement, the Company paid its customer \$68,000. Considering this payment and other provisions of the pellet plant agreement, including the forgiveness of \$7,315 of accounts receivable due from the customer, a \$75,315 reduction in sales was recorded in 2018.

18. Operations by Industry Segment and Geographic Area

The Company has three reportable segments, each of which is comprised of multiple business units that offer similar products and services and meet the requirements for aggregation. A brief description of each segment is as follows:

Infrastructure Group - The Infrastructure Group segment is made up of five business units. These business units include Astec, Inc. ("Astec"), Roadtec, Inc. ("Roadtec"), Carlson Paving Products, Inc. ("Carlson"), Astec Mobile Machinery GmbH ("AMM") and Astec Australia Pty Ltd ("Astec Australia"). Three of the business units (Astec, Roadtec and Carlson) design, engineer, manufacture and market a complete line of asphalt plants and their related components, asphalt pavers, screeds, milling machines, material transfer vehicles, stabilizers and related ancillary equipment. The other two business units (AMM and Astec Australia) primarily sell, service and install products produced by the manufacturing subsidiaries of the Company and a majority of their sales are to customers in the infrastructure industry. During late 2018, the Company decided to close AMM, located in Germany, in 2019, and its assets are being liquidated. The principal purchasers of the products produced by this group are asphalt producers, highway and heavy equipment contractors, and foreign and domestic governmental agencies. The Infrastructure Group had sales to one pellet plant customer totaling \$7,987, or 0.7% of total Company sales in 2017 and \$135,187, or 11.8% of total Company sales in 2016. Pellet plant sales in 2018, excluding the pellet plant agreement sales

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

reduction of \$75,315, as discussed in Note 17, Revenue Recognition, were not material. The pellet plant equipment sold to this customer was manufactured by each of the Company's segments.

Aggregate and Mining Group - The Company's Aggregate and Mining Group is comprised of eight business units which are focused on designing and manufacturing heavy processing equipment, as well as servicing and supplying parts for the aggregate, metallic mining, recycling, ports and bulk handling markets. These business units are Telsmith, Inc. ("Telsmith"), Kolberg-Pioneer, Inc. ("KPI"), Astec Mobile Screens, Inc. ("AMS"), Johnson Crushers International, Inc. ("JCI"), Breaker Technology Ltd/Breaker Technology, Inc. ("BTI"), Osborn Engineered Products, SA (Pty) Ltd ("Osborn"), Astec do Brasil Fabricacao de Equipamentos Ltda. ("Astec Brazil") and Telestack Limited ("Telestack"). The principal purchasers of products produced by this group are distributors, open mine operators, quarry operators, port and inland terminal operators, highway and heavy equipment contractors and foreign and domestic governmental agencies.

Energy Group - The Company's Energy Group is currently comprised of six business units focused on supplying heavy equipment such as heaters, drilling rigs, concrete plants, wood chippers and grinders, pump trailers, storage equipment and related parts to the oil and gas, construction, and water well industries, as well as commercial and industrial burners used primarily in commercial, industrial and process heating applications. The business units currently included in the Energy Group are Heatec, Inc. ("Heatec"), CEI Enterprises, Inc. ("CEI"), GEFCO, Inc. ("GEFCO"), Peterson Pacific Corp. ("Peterson"), Power Flame Incorporated ("Power Flame") and RexCon, Inc. ("RexCon"). Power Flame, located in Parsons, Kansas, was acquired in August 2016. RexCon, located in Burlington, WI, was formed to acquire substantially all of the assets and liabilities of RexCon, LLC on October 1, 2017. The principal purchasers of products produced by this group are oil, gas and water well drilling industry contractors, processors of oil, gas and biomass for energy production, ready mix concrete producers and contractors in the construction and demolition recycling markets.

Corporate - This category consists of business units that do not meet the requirements for separate disclosure as an operating segment or inclusion in one of the other reporting segments and includes the Company's parent company, Astec Industries, Inc., a captive insurance company and a Company-owned distributor in the start-up phase of operations in Chile. The Company evaluates performance and allocates resources to its operating segments based on profit or loss from operations before U.S. federal income taxes, state deferred taxes and corporate overhead and thus these costs are included in the Corporate category.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The accounting policies of the reportable segments are the same as those described in the summary of significant accounting policies. Intersegment sales and transfers are valued at prices comparable to those for unrelated parties.

Segment information for 2018

	Infrastructure Group	Aggregate and Mining Group	Energy Group	Corporate	Total
Revenues from external customers	\$ 442,289	\$ 453,164	\$ 276,146	\$ --	\$ 1,171,599
Intersegment revenues	21,568	16,603	17,578	--	55,749
Restructuring and asset impairment charges	1,870	--	11,190	--	13,060
Interest expense	10	384	17	634	1,045
Depreciation and amortization	8,424	9,383	9,149	957	27,913
Income taxes	880	2,349	306	(28,769)	(25,234)
Profit (loss)	(112,954)	45,464	3,070	1,586	(62,834)
Assets	536,744	590,512	309,397	367,211	1,803,864
Capital expenditures	14,823	8,731	4,580	769	28,903

Segment information for 2017

	Infrastructure Group	Aggregate and Mining Group	Energy Group	Corporate	Total
Revenues from external customers	\$ 553,691	\$ 403,720	\$ 227,328	\$ --	\$ 1,184,739
Intersegment revenues	25,965	16,209	24,877	--	67,051
Interest expense	49	634	9	148	840
Depreciation and amortization	7,581	9,363	7,904	954	25,802
Income taxes	1,318	462	491	17,356	19,627
Profit (loss)	26,641	35,748	16,219	(40,963)	37,645
Assets	666,651	558,684	304,158	390,300	1,919,793
Capital expenditures	7,424	9,194	3,540	604	20,762

Segment information for 2016

	Infrastructure Group	Aggregate and Mining Group	Energy Group	Corporate	Total
Revenues from external customers	\$ 608,908	\$ 359,760	\$ 178,763	\$ --	\$ 1,147,431
Intersegment revenues	16,957	35,031	24,946	--	76,934
Interest expense	31	948	4	412	1,395
Depreciation and amortization	7,205	10,033	6,655	920	24,813
Income taxes	3,033	664	437	27,973	32,107
Profit (loss)	71,482	34,877	4,145	(55,992)	54,512
Assets	657,225	518,351	271,121	417,351	1,864,048
Capital expenditures	14,451	7,437	5,018	178	27,084

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

The totals of segment information for all reportable segments reconciles to consolidated totals as follows:

	2018	2017	2016
Net income attributable to controlling interest			
Total profit (loss) for reportable segments	\$ (64,420)	\$ 78,608	\$ 110,504
Corporate expenses, net	1,586	(40,963)	(55,992)
Net loss attributable to non-controlling interest	295	205	171
Recapture (elimination) of intersegment profit	2,090	(55)	476
Total consolidated net income (loss) attributable to controlling interest	\$ (60,449)	\$ 37,795	\$ 55,159
Assets			
Total assets for reportable segments	\$ 1,436,653	\$ 1,529,493	\$ 1,446,697
Corporate assets	367,211	390,300	417,351
Elimination of intercompany profit in inventory	(4,986)	(7,075)	(7,020)
Elimination of intercompany receivables	(664,914)	(717,873)	(688,369)
Elimination of investment in subsidiaries	(300,709)	(303,209)	(272,766)
Other	22,202	(2,057)	(52,292)
Total consolidated assets	\$ 855,457	\$ 889,579	\$ 843,601

Sales into major geographic regions were as follows:

Year Ended December 31

	2018	2017	2016
United States	\$ 915,814	\$ 932,294	\$ 941,273
Canada	61,582	65,509	37,539
Africa	45,613	36,847	31,557
Australia and Oceania	38,645	40,201	29,948
South America (excluding Brazil)	30,081	18,562	28,204
Other European Countries	25,985	18,679	19,198
Mexico	9,632	8,508	13,489
Russia	9,571	13,609	3,185
Middle East	7,877	4,881	3,403
Brazil	6,292	10,478	4,300
Other Asian Countries	5,472	10,286	6,926
Japan and Korea	3,649	4,760	10,825
China	2,765	6,113	4,595
Post-Soviet States (excluding Russia)	2,730	5,951	3,293
Central America (excluding Mexico)	2,706	2,929	5,904
West Indies	1,494	3,421	2,994
India	957	1,026	318
Other	734	685	480
Total foreign	255,785	252,445	206,158
Total consolidated sales	\$ 1,171,599	\$ 1,184,739	\$ 1,147,431

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

Long-lived assets by major geographic region are as follows:

	December 31	
	2018	2017
United States	\$ 162,775	\$ 158,683
Brazil	8,866	11,114
Northern Ireland	7,641	6,342
South Africa	4,682	5,684
Australia	4,624	4,532
Canada	3,480	2,893
Germany	345	1,148
Chile	35	--
Total foreign	29,673	31,713
Total	\$ 192,448	\$ 190,396

19. Accumulated Other Comprehensive Loss

The after-tax components comprising accumulated other comprehensive loss is summarized below:

	December 31	
	2018	2017
Foreign currency translation adjustment	\$ (30,656)	\$ (21,140)
Unrecognized pension and post-retirement benefit cost, net of tax of \$2,230 and \$2,192, respectively	(3,227)	(3,103)
Accumulated other comprehensive loss	\$ (33,883)	\$ (24,243)

See Note 12, Pension and Retirement Plans, for discussion of the amounts recognized in accumulated other comprehensive loss related to the Company's Kolberg-Pioneer, Inc. defined pension plan.

20. Other Income

Other income consists of the following:

	Year Ended December 31		
	2018	2017	2016
Investment loss	\$ (228)	\$ (96)	\$ (276)
Licensing fees	--	651	546
Other	764	663	259
Total	\$ 536	\$ 1,218	\$ 529

21. Business Combinations

In October, 2017, the Company acquired substantially all of the assets and liabilities of RexCon LLC ("RexCon") for a total purchase price of \$26,443. The purchase price was paid in cash with \$3,000 deposited into escrow for a period of time not to exceed 18 months pending final resolution of certain post-closing adjustments and any indemnification claims. The Company's allocation of the purchase price includes the recognition of \$3,488 of goodwill and \$7,778 of other intangible assets consisting of non-compete agreements (5-year useful life), technology (19-year useful life), trade names (15-year useful life), and customer relationships (18-year useful life). The revenues and results of operations of RexCon were not significant in relation to the Company's consolidated financial statements for the period ended December 31, 2017 and would not have been material on a proforma basis to any earlier period. RexCon's operating results are included in the Company's Energy Group beginning in the fourth quarter of 2017. The Company determined that the full \$3,488 of goodwill that was acquired in the acquisition was impaired in the fourth quarter of 2018.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

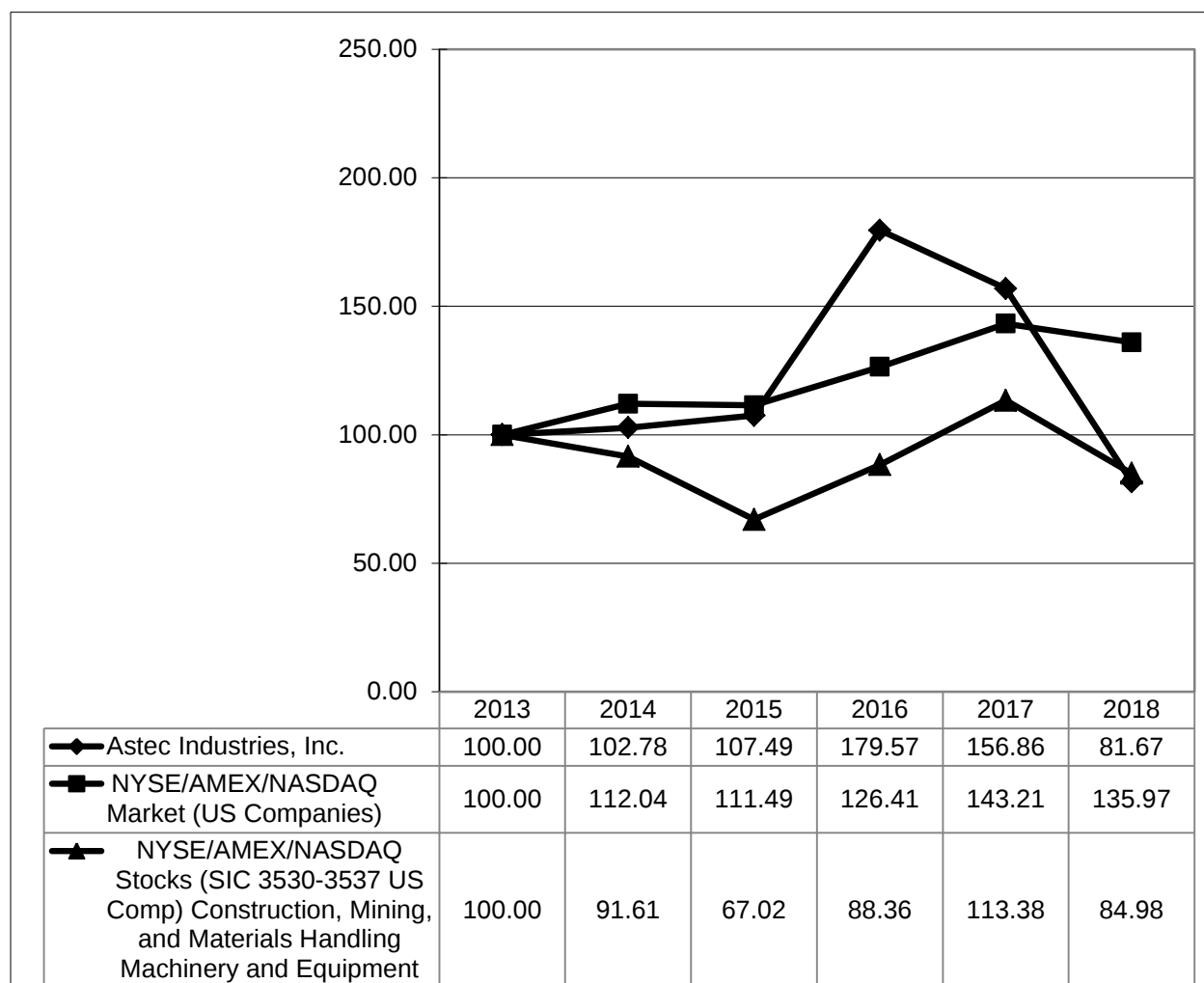
(Dollar and share amounts in thousands, except per share amounts unless otherwise specified)

RexCon, located in Burlington, Wisconsin was founded in 2003 through an asset acquisition with the original company founded over 100 years ago. RexCon is a manufacturer of high-quality stationary and portable, central mix and ready mix concrete batch plants, concrete mixers and concrete paving equipment. RexCon specializes in providing portable, high-production concrete equipment to contractors and producers worldwide in a totally integrated turnkey production system, including customized site layout and design engineering, batch plants, mixers, water heaters and chillers, ice production and delivery systems, material handling conveyors, gensets and power distribution, cement silos and screws, central dust collection, aggregate heating and cooling systems, batch automation controls and batch office trailers.

In August 2016, the Company acquired substantially all of the assets and certain liabilities of Power Flame Incorporated ("Power Flame") for a total purchase price of \$39,765. The purchase price was paid in cash with \$4,000 deposited into escrow for a period of time not to exceed two years pending final resolution of certain post-closing adjustments and any indemnification claims. The Company's allocation of the purchase price resulted in the recognition of \$12,632 of goodwill and \$17,990 of other intangible assets consisting of technology (19 year useful life), trade names (15 year useful life) and customer relationships (18 year useful life). The revenues and results of operations of Power Flame were not significant in relation to the Company's consolidated financial statements for the period ended December 31, 2016 and would not have been material on a proforma basis to any earlier period. Power Flame's operating results are included in the Energy Group beginning in the third quarter of 2016. The Company determined that an amount equal to \$7,702 of the goodwill that was acquired in the acquisition was impaired in the fourth quarter of 2018.

Power Flame, located in Parsons, Kansas, began operations in 1948 and manufactures and sells gas, oil and combination gas/oil and low NOx burners with outputs ranging from 400 thousand BTU's per hour to 120 million BTU's per hour as well as combustion control systems designed for commercial, industrial and process heating applications.

Comparison of 5 Year Cumulative Total Return
Assumes Initial Investment of \$100
Performance Graph for Astec Industries, Inc.



Notes:

- A. Data complete through last fiscal year.
- B. Corporate Performance Graph with peer group uses peer group only performance (excludes only company).
- C. Peer group indices use beginning of period market capitalization weighting.
- D. Prepared by Zacks Investment Research, Inc. Used with permission. All rights reserved Copyright 1980-2019.
- E. Calculated (or Derived) based from CRSP NYSE/AMEX/NASDAQ Market (US Companies), Center for Research in Security Prices (CRSP®), Graduate School of Business, The University of Chicago. Copyright 2018. Used with permission. All rights reserved.
- F. The graph assumes \$100 invested at the closing price of the Company's common stock on December 31, 2013 and assumes that all dividends were invested on the date paid.

OTHER INFORMATION

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The Form 10-K, as filed with the Securities and Exchange Commission, may be obtained at no cost by any shareholder upon written request to Astec Industries, Inc., Attention Investor Relations.

The Company's Code of Conduct is posted at www.astecindustries.com.

The Annual Meeting will be held on April 25, 2019, at 10:00 A.M. EST in the Training Center of Astec, Inc. located at 4101 Jerome Avenue, Chattanooga, TN 37407.





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