UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D. C. 20549

FORM 8-K

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

Date of Report (Date of earliest event reported): May 23, 2022 (May 23, 2022)

HOWMET AEROSPACE INC.
(Exact name of registrant as specified in its charter)

Delaware	**1-3610**	**25-0317820**
(State of Incorporation)	(Commission File Number)	(IRS Employer Identification No.)

201 Isabella Street, Suite 200 **Pittsburgh, Pennsylvania** (Address of Principal Executive Offices)	**15212-5872** (Zip Code)

Office of Investor Relations (412) 553-1950
Office of the Secretary (412) 553-1940
(Registrant's telephone number, including area code)

(Former Name or Former Address, if Changed Since Last Report)

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

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $1.00 per share	**HWM**	**New York Stock Exchange**
$3.75 Cumulative Preferred Stock, par value $100 per share	**HWM PR**	**NYSE American**

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (17 CFR §230.405) or Rule 12b-2 of the Securities Exchange Act of 1934 (17 CFR §240.12b-2).

Emerging growth company ☐

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

Item 7.01. Regulation FD Disclosure.

On May 23, 2022, Howmet Aerospace Inc. posted its Technology Day presentation to its website. A copy of the presentation is attached as Exhibit 99.1 to this Current Report on Form 8-K.

In accordance with General Instruction B.2 of Form 8-K, the information in Item 2.02 of this Current Report on Form 8-K, including Exhibit 99.1, shall not be deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liability of that section, and shall not be incorporated by reference into any registration statement or other document filed under the Securities Act of 1933, as amended, or the Exchange Act, except as shall be expressly set forth by specific reference in such filing. The information set forth under this Item 7.01, including Exhibit 99.1, shall not be deemed an admission as to the materiality of any information in this Current Report on Form 8-K.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

99.1	Howmet Aerospace Inc. Technology Day Presentation, dated May 23, 2022.
104	The cover page of this Current Report on Form 8-K, formatted in Inline XBRL.

SIGNATURE

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

HOWMET AEROSPACE INC.

Dated: May 23, 2022

By: /s/ Lola F. Lin
Name: Lola F. Lin
Title: Executive Vice President, Chief Legal Officer and Secretary

Exhibit 99.1

Howmet Aerospace Technology Day 2022

John Plant | Executive Chairman and Chief Executive Officer
Ken Giacobbe | EVP and Chief Financial Officer

May 23, 2022

HOWMET AEROSPACE

Important Information

Forward–Looking Statements

This presentation contains statements that relate to future events and expectations and as such constitute forward-looking statements within the meaning of the Priv Securities Litigation Reform Act of 1995. Forward-looking statements include those containing such words as "anticipates," "believes," "could," "estimates," "expects," "forecasts," "goal," "guidance," "intends," "may," "outlook," "plans," "projects," "seeks," "sees," "should," "targets," "will," "would," or other words of similar meaning. A statements that reflect Howmet Aerospace's expectations, assumptions or projections about the future, other than statements of historical fact, are forward-looking statements, including, without limitation, statements, forecasts and outlook relating to the condition of end markets; future financial results or operating performanc future strategic actions; and Howmet Aerospace's strategies, outlook, and business and financial prospects. These statements reflect beliefs and assumptions that are based on Howmet Aerospace's perception of historical trends, current conditions and expected future developments, as well as other factors Howmet Aerospace believes are appropriate in the circumstances. Forward-looking statements are not guarantees of future performance and are subject to risks, uncertainties and chan in circumstances that are difficult to predict, which could cause actual results to differ materially from those indicated by these statements. Such risks and uncertainti include, but are not limited to: (a) uncertainty of the duration, extent and impact of the COVID-19 pandemic on Howmet Aerospace's business, results of operations, financial condition; (b) deterioration in global economic and financial market conditions generally (including as a result of COVID-19 and its effects, among other thi on global supply, demand, and distribution disruptions); (c) unfavorable changes in the markets served by Howmet Aerospace; (d) the impact of potential cyber attac and information technology or data security breaches; (e) the loss of significant customers or adverse changes in customers' business or financial conditions; (f) manufacturing difficulties or other issues that impact product performance, quality or safety; (g) inability of suppliers to meet obligations due to supply chain disruptions or otherwise; (h) the inability to achieve revenue growth, cash generation, cost savings, restructuring plans, cost reductions, improvement in profitability, strengthening of competitiveness and operations anticipated or targeted; (i) inability to meet increased demand, production targets or commitments; (j) competition from new product offerings, disruptive technologies or other developments; (k) geopolitical, economic, and regulatory risks relating to Howmet Aerospace's global operations, including geopolitical and diplomatic tensions, instabilities and conflicts, as well as compliance with U.S. and foreign trade and tax laws, sanctions, embargoes and other regulations; (l) the outcome of contingencies, including legal proceedings, government or regulatory investigations, and environmental remediation, which can expose Howmet Aerospace to substantial costs and liabilities; (m) failure to comply with government contracting regulations; (n) adverse changes in discount rates or investment returns on pension assets; and (o) the other risk factors summarized in Howmet Aerospace's Form 10-K for the year ended December 31, 2021 and other reports filed with the U.S. Securities and Exchange Commission (SEC). Market projections are subject to the risks discussed above and other risks in the market. The statements in this presentation are made as of the date of this presentation, even if subsequently made available by Howmet Aerospac on its website or otherwise. Howmet Aerospace disclaims any intention or obligation to update publicly any forward-looking statements, whether in response to new information, future events, or otherwise, except as required by applicable law.

HOWMET AEROSPACE

Important Information (continued)

Non-GAAP Financial Measures

Some of the information included in this presentation is derived from Howmet Aerospace's consolidated financial information but is not presented in Howmet Aerospace's financial statements prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). Certain of these d are considered "non-GAAP financial measures" under SEC rules. These non-GAAP financial measures supplement our GAAP disclosures and should not be conside an alternative to the GAAP measure. Reconciliations to the most directly comparable GAAP financial measures and management's rationale for the use of the non-GAAP financial measures can be found in the Appendix to this presentation. Howmet Aerospace has not provided reconciliations of any forward-looking non-GAA financial measures (including adjusted EBITDA, adjusted EBITDA margin and adjusted earnings per share, each excluding special items, and free cash flow) to the most directly comparable GAAP financial measures because such reconciliations, as well as the directly comparable GAAP measures, are not available without unreasonable efforts due to the variability and complexity of the charges and other components excluded from the non-GAAP measures, such as the effects of foreign currency movements, gains or losses on sales of assets, taxes, and any future restructuring or impairment charges. These reconciling items are in addition t the inherent variability already included in the GAAP measures, which includes, but is not limited to, price/mix and volume. Howmet Aerospace believes such reconciliations of forward-looking non-GAAP financial measures would imply a degree of precision that would be confusing or misleading to investors.

References to "Pro Forma" reflect metrics further adjusted for separation-related allocations, as if the Arconic Inc. separation transaction (effective as of 4/1/2020) had occurred at the beginning of the period presented.

HOWMET AEROSPACE

Agenda

1. Company Overview
2. Engine Products
3. Fastening Systems
4. Engineered Structures
5. Forged Wheels
6. Financial Update

HOWMET AEROSPACE

Today's Presenters

John Plant

Executive Chairman & Chief Executive Officer

Ken Giacobbe

EVP and Chief Financial Of

HOWMET AEROSPACE

Unique Assets, Iconic Trusted Brand, Differentiated Technologies

Iconic, Trusted Brand

HOWMET AEROSPACE

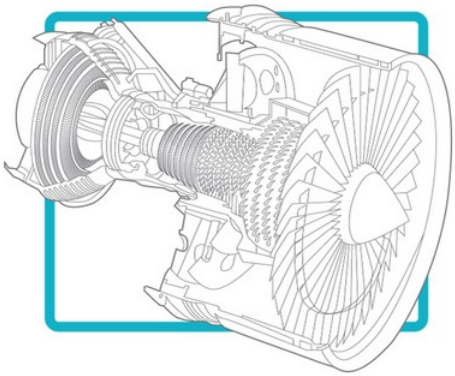
80+ year history:
Major presence in jet engines

Leading market position:
High barriers to entry

Collaborative relationships:
Blue-chip customer base

HOWMET AEROSPACE

Differentiated Technologies with Rich IP Portfolio and Process Know-How

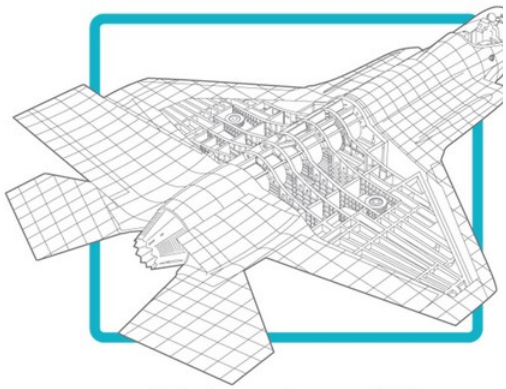


Deep customer relationships allow company to lead the technology curve

Strategic global footprint
with state-of-the-art facilities

Nearly 1,150 granted and pending patents
for parts, alloys, designs and production processes drive competitive advantage

Mission-Critical Supplier in Growing Markets



Able to supply over 90% of structural / rotating aero-engine parts

Stability underpinned by ~70% of aerospace revenue under long-term agreeme with strong engine spares demand

Increased content on next-generation platforms

Howmet Aerospace Strategy

Focus on what we are good at to drive **growth above market rate**

Prioritize major differentiated products for resource allocation

Underpin strategy with **commercial and operational discipline**

Execute a **disciplined capital allocation strategy**

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Four Segments: ~85% of Revenue from Number 1 or 2 Market Position

Leading Global Provider of Advanced Engineered Solutions

Engine Products

~$2.3B 2021 Revenue

Global leader in jet engine components and seamless rolled rings

27 manufacturing plants and 1 dedicated R&D facility

- #1 Aerospace Airfoils
- #1 Seamless Rolled Rings
- #1 IGT Airfoils
- #2 Aerospace Structural Castings

Select Customers

GE, Pratt & Whitney, Rolls-Royce, HOWMET AEROSPACE, SAFRAN

Fastening Systems

~$1.0B 2021 Revenue

Global leader in fasteners

20 manufacturing plants and 2 dedicated R&D facilities

- #1 Aerospace Fasteners
- #1 N.A. Utility Scale-Solar
- #1 N.A. Truck & Trailer Industrial Fasteners

Select Customers

BOEING, AIRBUS, LOCKHEED MARTIN

Engineered Structures

~$0.7B 2021 Revenue

Leader in aerospace US defense structures

12 manufacturing plants and 1 dedicated R&D facility

- #1 Aerospace Defense Structures
- #1 Aerospace Defense / Wheel and Brake
- #1 Aerospace Ti Extrusions and Seat Tracks

Select Customers

BOEING, AIRBUS, LOCKHEED MARTIN, Pratt & Whitney, GE

Forged Wheels

~$0.9B 2021 Revenu

Global leader in forged aluminum commercia vehicle wheels

6 manufacturing plants and 2 dedicated R&D facilities

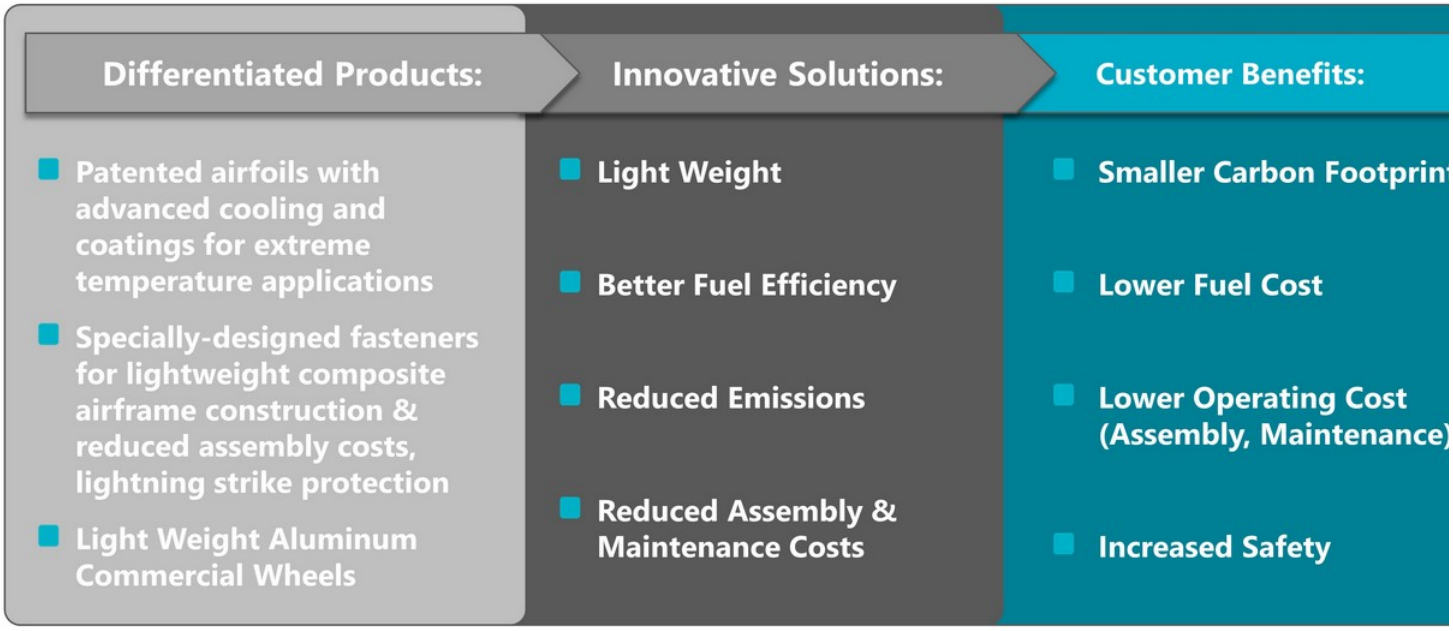
- #1 Forged Aluminum Wheels

Select Customers

PACCAR, VOLVO, DAIML

Rankings reflect market positions

Differentiated Products Provide Our Customers with Innovative Solutions



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65 Global Manufacturing Locations
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UNITED KINGDOM
Ecclesfield
Exeter
Glossop
Ickles
Leicester
Low Moor
Redditch
Telford
Welwyn Garden City
FRANCE
Dives
Evron
Gennevilliers
St. Cosme-en-Vairais
Toulouse
Us
GERMANY
Bestwig
Erwitte
Hildesheim-Bavenstedt
Kelkheim
HUNGARY
Nemesvámos
Székesfehérvár
CANADA
Georgetown, Ontario
Laval, Québec
Barberton, OH
Canton, OH
Cleveland, OH
Niles, OH
Big Lake, MN
New Brighton, MN
La Porte, IN
Whitehall, MI
Carson, CA
City of Industry, CA
Fullerton, CA
Fontana, CA
Torrance, CA
Rancho Cucamonga, CA
UNITED STATES
Washington, MO
Tucson, AZ
MEXICO
Ciudad Acuña
Monterrey
Branford, CT
Winsted, CT
Dover, NJ
Kingston, NY
Rochester, NY
Hampton, VA
Martinsville, VA
Morristown, TN
Savannah, GA
Houston, TX
Waco, TX
Wichita Falls, TX
MOROCCO
Casablanca
JAPAN
Jōetsu City
Nomi
CHINA
Suzhou
AUSTRALIA
Oakleigh
Engine Products
Fastening Systems
Engineered Structures
Forged Wheels


Aerospace Market
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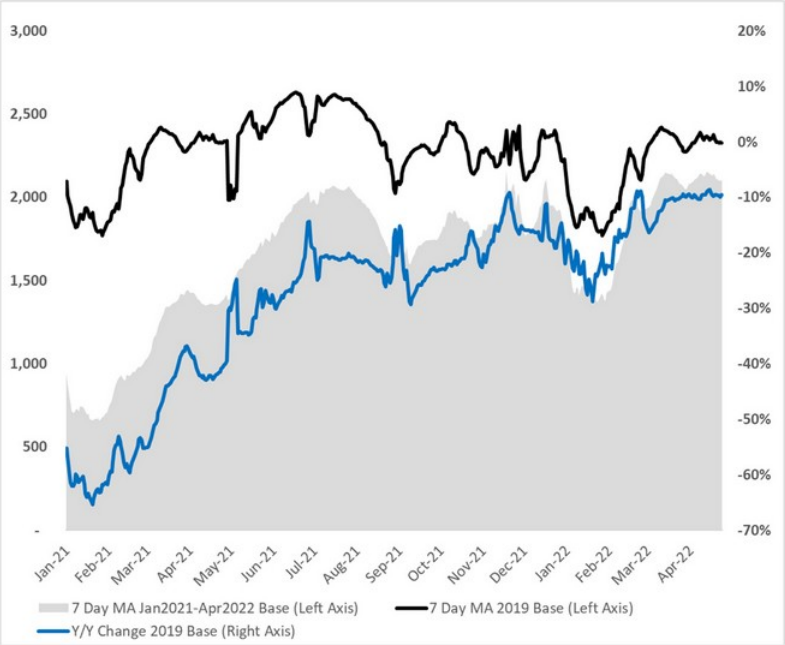
TSA Check-Ins Recovering From Pandemic Lows



TSA Check-in data in thousands, MA = moving average

Aero Recovery Continues

- TSA check-ins now ~10% below 2019 leve
- Recovery from Q1 2021 low of ~65% reduction in TSA data
- COVID impact largely transitory as shown recovery from COVID Variant impact
- Expect recovery to continue through 2022

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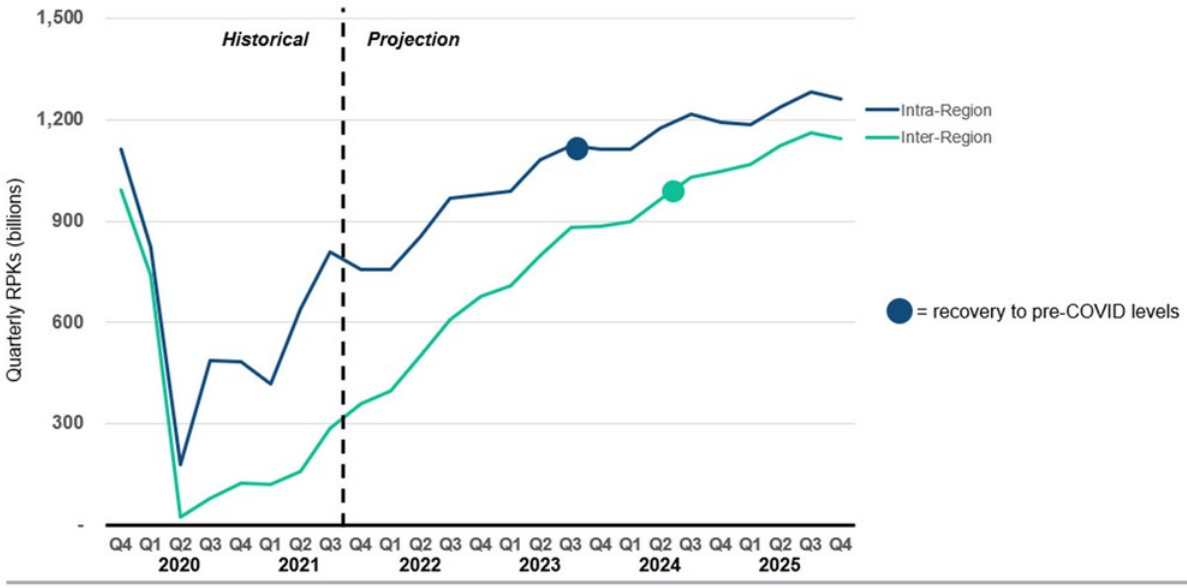
Source: TSA

Commercial Aerospace Recovery Led by Domestic Travel

RPK Forecast by Flow Type, Intra-Region and Inter-Region



Source: AeroDynamic analysis, IATA

AeroDynam ADVISOR

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RPK = Revenue Passenger Kilometers

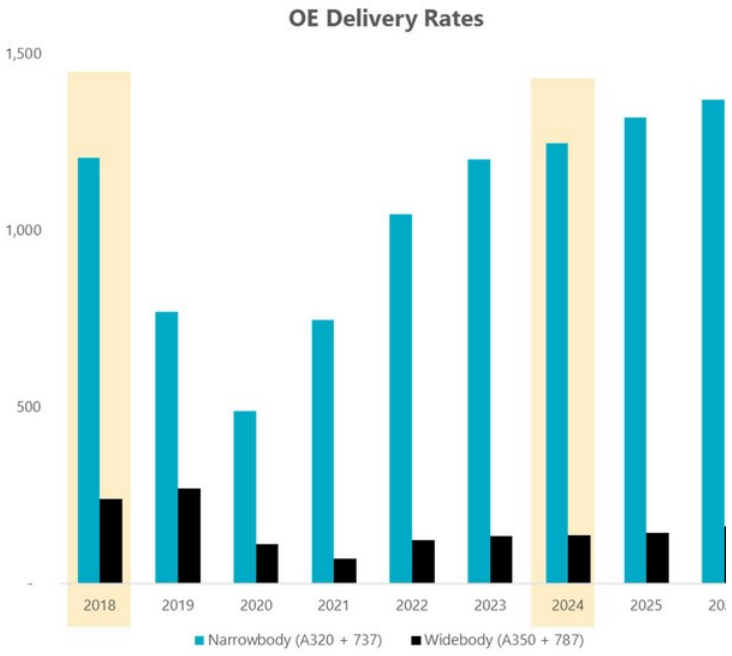
Near-Term Aerospace Growth Driven by Narrowbody Builds

Narrowbody Expectations

- OE build rates surpassing pre-pandemic levels in 2024
- Airbus A320 rate to exceed 2019 levels in 2024, Boeing 737 rate near pre-pandemic levels in 2025

Widebody Expectations

- Widebody expansion in 2023, 2024, & 2025
- OE build rates signal ~60% of 2019 levels by 2026



Pre-Pandemic ~1,400 Aircraft

Howmet Shipping volumes may not exactly match stated OE Delivery Rates

Returns to ~1,400 Aircraft (Different Mix)

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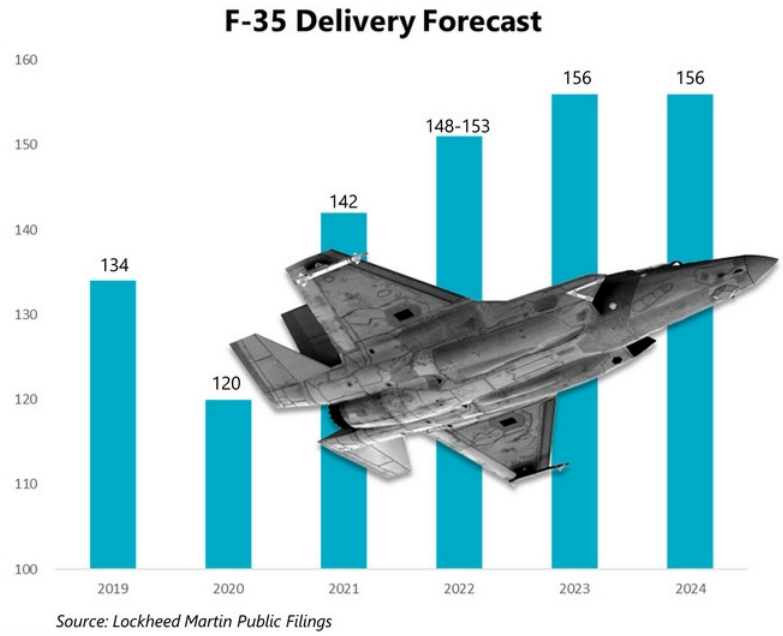
Source: Teal Group

Defense Growth Driven by F-35 Production Rates



Source: Lockheed Martin Public Filings

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- Volumes remain **fully funded** by US Government and supported by increased **foreign military sales**
- Production plan remains a **growth avenue**
- Content across **Bulkheads, Fasteners, and Engine Components**
- **Spares** growth expected to increase
- **~40%** of Howmet 2021 Defense Aero Reve
- Opportunities for growth in non-F-35 defe including the **T408/T901** and **B52** engine replacement

Engine Products

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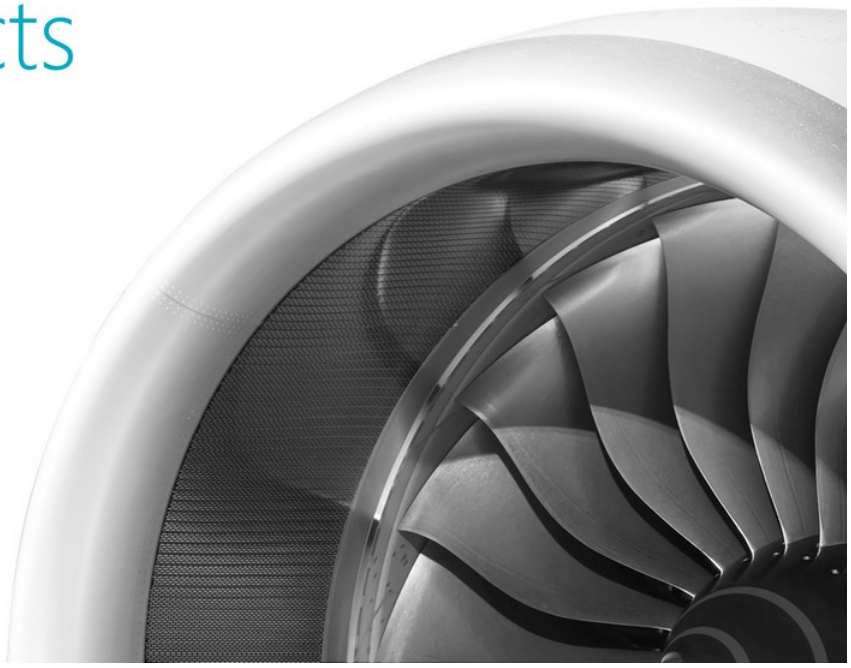

Engine Products Video

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Engine Products: Multiple Techniques to Meet Customer Needs

Market Needs:

- Improved Fuel Efficiency
- Reduced Emissions
- Reduced Weight
- Predictable Overhaul Cycles
- Fuel Flexibility
- Speed to Market

Major Drivers to Achieve:

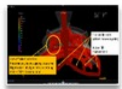
- Operating Temperature
- Aerodynamic Shapes
- Airflow Control
- Environmental Resistance
- Component Integrity
- Model Based Manufacturing

We Deliver Through:

- Casting Techniques
- Cooling Techniques
- Complex Shapes
- Coating Techniques
- Enhanced Strength
- Digital Manufacturing and Automation







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Engine Products: Maintaining Leading Positions Across All Product Lines

Market Segment	Products (in order of complexity)		Competitive Position	Highlights	Revenue % of FY21 To
Aero Airfoils	■ Single Crystal (SC) ■ Enhanced Equiax ■ Equiax ■ Directionally Solidified (DS)		1 NUMBER ONE Aerospace Airfoils	■ World's largest single crystal airfoil producer ■ Vertically integrated alloy, cores, testing, machining, coatings, and key equipment builds ■ World class assets and recent capex investments	
Structural	■ Superalloy ■ Titanium ■ Aluminum		2 NUMBER TWO Aerospace Structural Castings	■ Organic growth (Ni casting plant La Porte, IN) and acquisition (Tital, Ti structural leader in EU) ■ Structural Castings up to ~60 inches diameter ■ #1 in Aluminum castings for Aerospace	
IGT Airfoils	■ Single Crystal (SC) ■ High Gradient ■ Directionally Solidified (DS) ■ Equiax		1 NUMBER ONE IGT Airfoils	■ Applying multiwall aeroengine core technology ■ Industry leader in large DS blades (Greater than 3 feet) ■ Uniquely positioned with major OEMs ■ Includes ~8% from Oil and Gas / Other	
Seamless Rings	■ Superalloy ■ Titanium ■ Steel ■ Aluminum		1 NUMBER ONE Seamless Rolled Rings	■ Recent 10K ton press installation ■ Established machining in Mexico ■ Diameters 10" to 180"	

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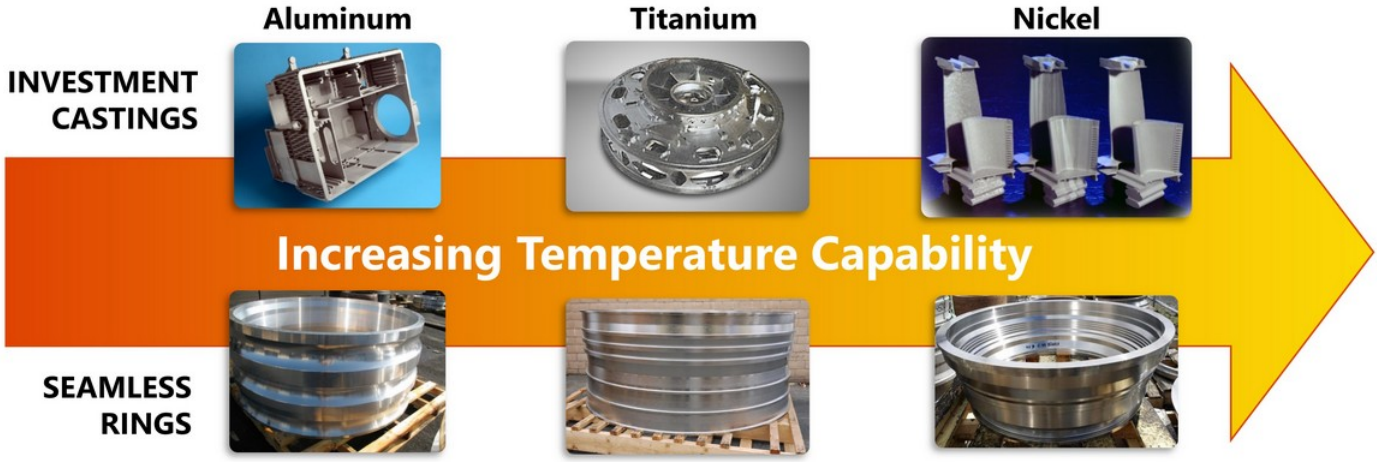
~90% of Revenue Under Long-Term Agreements (LTAs)

Engine Products Materials Expertise

- Engine OEM is responsible for alloy selection, design, and specifications
- Produced to achieve targeted life, efficiency & emissions targets; highest operating temperature with maximum coolin
- Casting and rolling of over 100 different alloys across aluminum, titanium, and nickel alloys
- Materials selected based on temperature, strength, and weight requirements
- Over 80 years of experience



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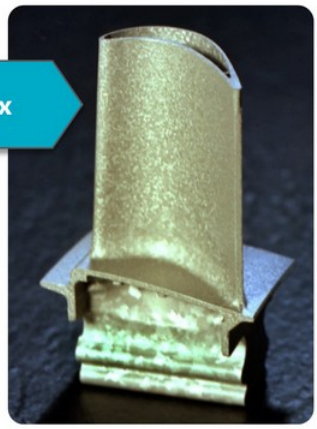
Investment Casting Process Controls Microstructure and Properties

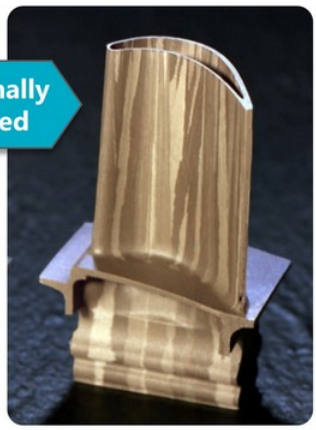
- **Nickel base superalloys are complex**: Greater than 15 element alloys, including refractory and rare earth elements
- **Very tight control** (Less than 1ppm) on tramp elements, which degrade properties
- **Equiax and Directionally Solidified Alloys** have Grain Boundary Strengtheners
- **Single Crystal Alloys** remove Grain Boundary Strengtheners and have highest melting points

Equiax



- Random, fine grain structure
- Largest market, common process
- Structural, Aero low-pressure turbine (LPT), IGT, Rings
- Lower temperature capability

Directionally Solidified



- Aligned grain structure
- Targeted / niche applications
- Aero LPT, IGT blades
- Medium temperature capability

Single Crystal

- A single grain
- Premium process, growing marke
- Most demanding temperature an strength applications

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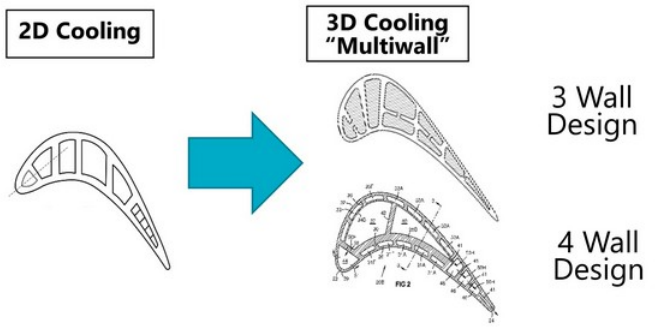
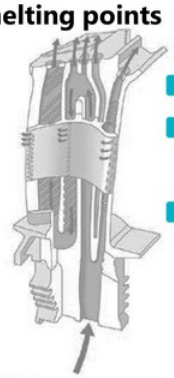
The Technology Behind the Solution: Manage Component Temperature

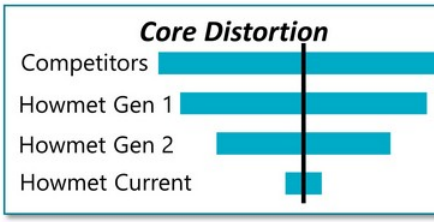
Air blown through high pressure turbine (HPT) components enables ***operation in environments above their melting poi***

- Blades and vanes are air cooled
- Early cooling schemes were straight passages
- Serpentine cooling developed to more efficiently use cooling air
- **Special features increase heat transfer and make the cooling more efficient**
- **Melting point of single crystal alloys ~2,500˚F, operate in environments greater than 200˚F above their melting points**





- HPT airfoils transitioning from 2D to 3D cooling to cool more from less air
- **Howmet has a new generation of core bodies**
  - Multiwall cooling via proprietary 3D Core process
- Cores distort at casting temperatures; Howmet's latest generation cores distort less, which **improves yield on the highest complexity components**



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Sole Provider for Highest Temperature Engines in F-35 (Joint Strike Fight

F135 Turbine Inlet Temperature is greater than 1,000˚F above alloy melting point

Joint Strike Fighter's F135
Turbine Inlet Temperature

~3,600°F[1]

Modern Commercial Jet
Turbine Inlet Temperature

~2,500°F[2]

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1) American Society of Engineers.
2) *Fundamentals of Jet Propulsion with Applications*, Cambridge Aerospace Series. Ronald D. Flack. 2005

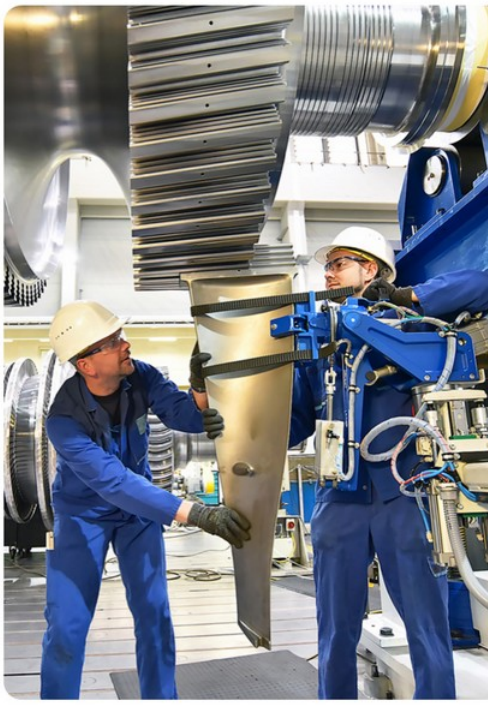
Aero-Engine Capabilities Scaled to Land-Based Industrial Gas Turbines (IG

Land-based turbines used for power generation

- Efficiency approaching industry-leading 65% combined cycle
- Fuel flexibility, low NOx operation (40% reduction)
- Base load and peaking with rapid ramp to full power

Aero-engine manufacturing and technology scaled to IGT sizes

- 3D Core multiwall cooled 1st stage blades
- Single crystal (SC) or directionally solidified (DS) blades used throughout latest generation turbines to avoid creep
- Proprietary cores, molds, DS/SC furnaces and solidification technology
- Large DS blades are greater than 3 feet long
- Proprietary ***High Gradient*** process eliminates grain defects, enabling large blade production



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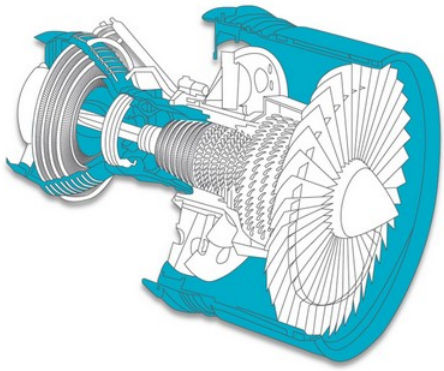
The Technology Behind the Solution: Seamless Rings

Forged and Rolled Rings are critical for structural support and containment during engine operation

- High strength alloys with strict microstructure requirements
- Seamless rings employed to increase properties
- Thin walls required to reduce weight
- Rings provide the support structure for the engine and containment of failed components



- Best practices documented and replicated across sites
- **Automating high labor operations for productivity and quality improvements**
- **Investing in forge and ring mill controls to reduce cost an improve quality – applying casting technology**
- Machining facility in Mexico to optimize cost

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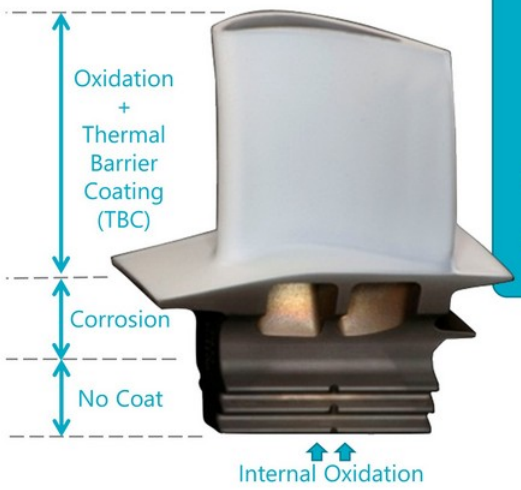
The Technology Behind the Solution: Coatings

Complex coatings are required to survive the engine environment

- Corrosion, oxidation and thermal barrier coatings
- Fuel and environmental contaminants necessitate corrosion-resistant coatings
- Oxidation and thermal barrier coatings enable higher temperature operation

Solutions

- Patented hafnium bond coat improves Thermal Barrier Coating (TBC) life and temperature capability
- Coat externals and internals in a single cycle
- Uniformly deposit TBCs on complex geometries



Each blade can have multiple coatings targeted to specific areas and metal temperatures

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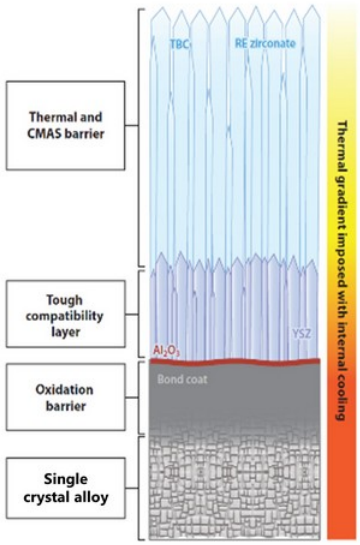
Next Generation Technologies Developed to Maintain Advantage

Cast Film Cooling Holes

- High pressure turbine components can have hundreds of cooling holes drilled into the casting
- Line-of-sight limits hole placement
- Drilling limits hole shape and damages surface

- **Howmet has developed and patented a capability to cast film cooling holes**
- Produce holes the diameter of "2 human hairs"
- Removes line-of-sight manufacturing constraint
- Produce complex, non-drillable shapes without damaging the surface for more effective film cooling

Complex, Multiple Layer and Chemistry TBCs

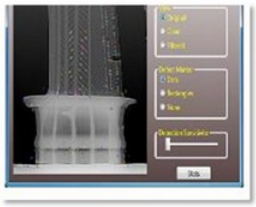


- Most current generation T coatings are single layer a chemistry
- **Next generation coating are multi-layered and employ new unique rare earth chemistries**
  - Improve thermal resista
  - Operate in higher temperature environme
  - Multiple layers improve
  - Improved oxidation resistance

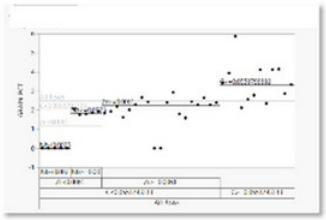
HOWMET AEROSPACE

Superior Manufacturing Technology to Achieve Quality and Yields

Automation *"Variance Reduction"*



Data Analytics *"Variance Prevention"*



Rapid Prototyping *"Speed to Market"*

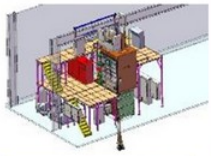
HOWMET AEROSPACE

Advanced Ceramic Cores, Specialty Wax, Advanced SC Alloys

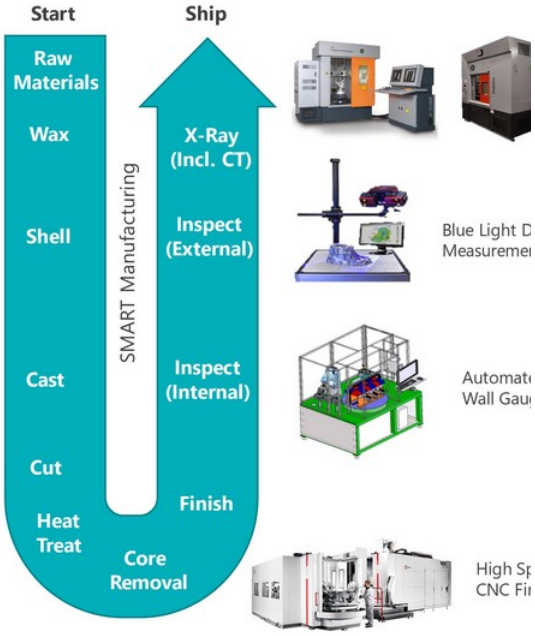
Advanced Wax Press / Tooling & 3-D Printing

Monoshell (Shell Build)

Automated Casting with Advanced Controls



Robotic Water Jet Cutting & Shell Removal



Engine Products: Key Messages

Continue to develop and expand material, process, and manufacturing expertise

- **Enable Turbine Performance** by Controlling Shape, Structure, and Managing Temperature/Airflow
- Processes: Equiax, Directionally Solidified and Single Crystal **Casting**, **Coatings**, and Seamless Rolled **Rings**
- Materials: **Nickel, Titanium, and Aluminum alloys**

Continue to develop and commercialize innovative technologies and techniques

- **Collaborate with OEMs** on Advanced Military and Commercial Designs
- **Dedicated R&D** Tightly Tied to Customers and Operations
- **Rich Intellectual Property** Protected by Trade Secrets, Patents, Material Developments, and Equipment Builds
- **Vertical Integration** of Materials, Manufacturing Processes, and Equipment Provides "**Moats**" of Protection
- **Capex Investment:** ~$360M in Growth Capex Installed Since 2019
- Focus on **Increasing Automation** in the Production Processes

Differentiated technologies and solutions to continue driving content gains

HOWMET AEROSPACE

Fastening Systems

HOWMET AEROSPACE

Fastening Systems Video

HOWMET AEROSPACE

Fastening Systems Advantage

Broad Product Offering – One Stop
Proprietary Products
Industry leading brands including Camloc® and Huck®

Anti Vibration
Ease of Assembly and Rework
Low Profile (Stealth)
'Faraday Cages' – Composites
Lower Maintenance Costs
Automated Tools

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Fastening Systems: Whole System Solutions to Meet Customer Needs

Market Needs:	Major Drivers to Achieve:	We Deliver Through:
Aerospace ■ Efficiency of Assembly ■ Aero/Fuel Efficiency ■ Maintenance Accessibility ■ Value	■ Automated Assembly ■ Ease of Assembly ■ Composite Materials ■ Aerodynamic Shapes	■ One-Sided Installation (Blind Fasteners) ■ Smart Installation Tools ■ Lightning Strike Protection (LSP) Fasteners ■ Leading R&D Capabilities
Industrial ■ Rapid Assembly ■ In-the-Field Installation ■ Maintenance-Free Solutions ■ Speed to Market	■ Complete Installation Tooling Solutions ■ Vibration Resistance ■ Multi-Material Joining ■ Rapid Prototyping	■ Portable Installation Tooling ■ Vibration-Resistant Fasteners ■ Resistance Spot Riveting (RSR®) Technology

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Fastening Systems: Leading Positions Across All Market Segments

Market Segment	Products (In order of Complexity)	Competitive Position	Highlights	Revenue % of FY21 Tot
Aerospace (Airframe, Engine, Specialty)	■ Latches ■ Panel Fasteners ■ **Single Sided** ■ Sleeved Pin Systems ■ **Lockbolts and Collars** ■ Threaded Pin Systems ■ Inserts/Studs ■ Nuts, Bolts, Screws ■ Installation Tooling	1 NUMBER ONE Aerospace Fasteners	■ **Broadest product offering** (1M SKUs) ■ **60% of revenue in LTAs** ■ **440+ patents** ■ **30% of revenue from patented or proprietary products** ■ Industry **leader in quality**	
Industrial (Commercial Transportation, Renewable Energy, Automotive, Material Handling)	■ RSR® Technology ■ **Single Sided** ■ **Lockbolts** ■ Specialty Fasteners ■ Wire Thread Inserts ■ Installation Tooling	1 NUMBER ONE N.A. Truck & Trailer Industrial Fasteners 1 NUMBER ONE N.A. Utility-Scale Solar	■ **Niche, high value-add applications** requiring vibration resistance and/or multi-material joining ■ **40% of revenue from patented products** ■ Fastening System **(Tool + Fastener)** provides superior reliability and speed of installation	

~60% of Revenue Under Long-Term Agreements (LTAs)

HOWMET AEROSPACE

Fastening Systems: Industry Leader in Innovation

3 new product lines expected to be introduced by 2024

Innovation Investment and Activity Outpacing Our Peers

2013 — 2021

Bobtail®
- Consistent clamp
- Less material
- Speed/Ease of Use

Hucklock
- Corrosion resistant
- Positive lock
- Off sheet bulb

Huckspin
- Installation speed
- Consistent clamp

FC-43®
- High strength
- Ease of install
- Low mfg cost

Flite-Tite® B777X
- LS protection
- Simple installation
- Low assembly cost

StreamTite™ rivet
- Aerodynamic
- Low assembly cost

Bobtail 2®
- Consistent clamp
- Smaller diameters
- Speed/Ease of Use

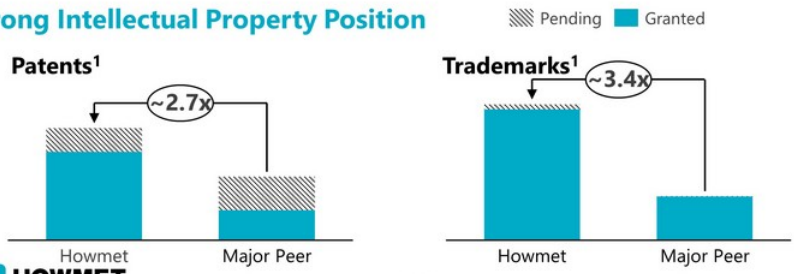
Ergo-Tech®
- Single-sided install
- Flush breaking
- Lower weight

Ergo-Tech MAX™
- Single-sided install
- Flush breaking
- CFRP compatible

RSR®

- **2 world-class R&D centers** with dedicated teams
- **State-of-the-art design and analysis** technology and equipment
- Mechanical and **metallurgical laboratory testing** capabilities
- Collaborations with **top research universities and associations**

Strong Intellectual Property Position



1) Internal Analysis from August 2021

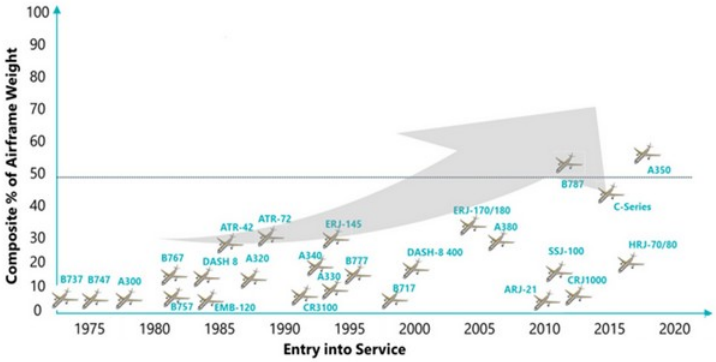
Industry Leading Brands

Camloc®	RAM®	Simmonds®
Delron®	Recoil®	Tridair®
Huck®	Republic®	VT®
Kaynar®	Rosan®	Voi-Shan®
Mairoll®	Screwcorp™	

Flite-Tite® Fasteners Address Challenges for Composite Aircraft

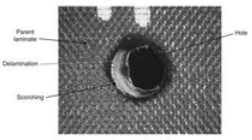
Lightning Strike Protection (LSP) fasteners to make flight safer in composite planes

Composite Usage in Airframes Has Grown Exponentially



With composite materials, come technological challenges:

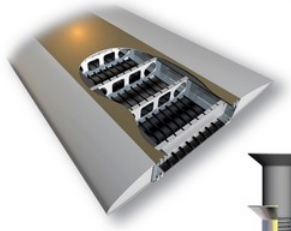
Lightning Strike

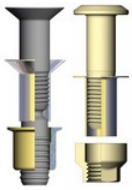


Delamination during installation

Challenges Offer Opportunity for High-Value Fastener Applica

Flite-Tite® sleeve expands into composite to create a tight fit and thereby conduct current through the structure

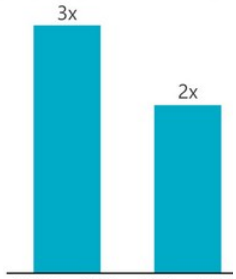




Howmet fastener conte
value is significantly higher on composite aircraft

Howmet value per shipset

(composite plane vs. metallic pla



BOEING AIRBUS

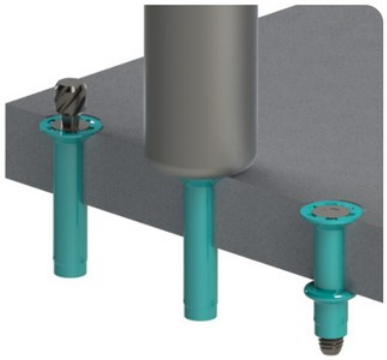
HOWMET AEROSPACE

Ergo-Tech® Blind Bolt Enables Automated Assembly

One side access fastener for metallic or composite structures

Ergo-Tech® - Advantages

- **Low Installed Cost –** No secondary ops.
- **Adaptable** to Metallic, Composite, Hybrid
- **Single Piece –** Alternative to pins & collars
- **Ideal for Automation –** One-side Assembly
- **Ergonomic** for manual applications
- **Mechanical Performance –** Equivalent to solid 2-piece alternatives



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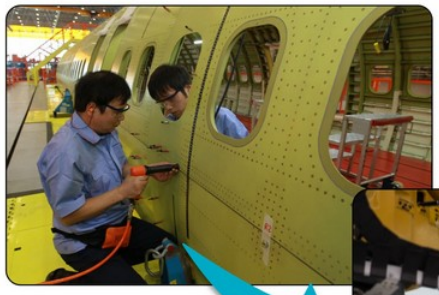
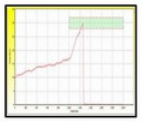
Automation



From **labor intensive** two-sided assembly

To **automated** one-sided assembly



Integrated Ergo-Tech®-2 Installation Tool

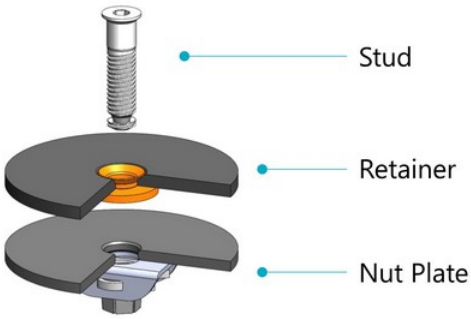
Sensor–based installation tool with data acquisition enables installation process monitoring

FC43® Panel Fastener Self-Retains for Maintenance Ease

High-Reuse Structural Fasteners for Access Panels

FC43® - Advantages

- **Self-retaining/self-captivated** (stays attached) and has **"hold-out" capability in all positions**
- **Eliminates** Foreign Object Debris **(FOD)**
- Strength-to-size ratio results in **higher weight savings** potential



Ease of Access

Fasteners stay attached enabling **rapid re-assembly**

Especially prevalent in **military applications** where **"in-the-field"** maintenance is required

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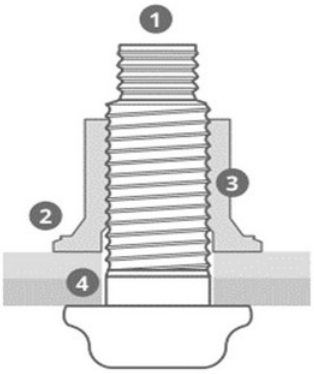
Huck BobTail® Lockbolt: Fast Installation and Maintenance-Free

Huck BobTail® lockbolt delivers up to **5x the fatigue strength** of conventional nuts and bolts, unmatched installation speed, and industry-leading vibration resistance



1 Pintail-less design means reduced noise, no waste, and improved corrosion resistance.

2 Visual evidence of successful installation provided by installation indicator.

3 Collar material swaged into the lockgrooves forms a permanent, vibration-resistant connection.

4 Low-swage technology allows for faster, lighter, ergonomic tooling with parts that last longer.

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Value proposition resonates across industries:

- Installs **50% faster** than conventional solutions
- **100% less maintenance**, with no re-tightening required ever

More power, faster
Enables hundreds of thousands of dollars in higher revenue output

More miles, no downtime
Enables billions of service-free miles across fleets

Heavy duty hold
Enables thousands of hours of additional productivity

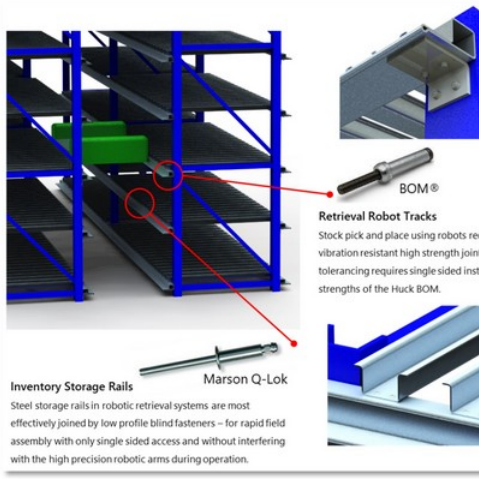
Industrial Fasteners are a Growth Opportunity

Fasteners Advantage

- Rapid assembly
- Vibration resistance
- Maintenance-free

Mobile Shelving Units

The Huck BOM allows for fast, consistent, vibration resistant assembly of racking systems in a wide range of construction environments. The low labor input and short training time enable global deployment and scalability.



Retrieval Robot Tracks

Stock pick and place using robots re
vibration resistant high strength join
tolerancing requires single sided inst
strengths of the Huck BOM.

Inventory Storage Rails

Steel storage rails in robotic retrieval systems are most effectively joined by low profile blind fasteners – for rapid field assembly with only single sided access and without interfering with the high precision robotic arms during operation.

Key Customers

amazon

DAIFUKU
Always an Edge Ahead

muratec

symbotic

FAS

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Fastening Systems: Key Messages

Market Share Growth in Aerospace and Expansion into adjacent Industrial Markets

- Have **broadest portfolio** of **customer-qualified sites and products**
- Capability to provide **system solution** including fasteners, installation tooling, post-installation gauging, and customer support

Continue to develop and commercialize innovative technologies and techniques

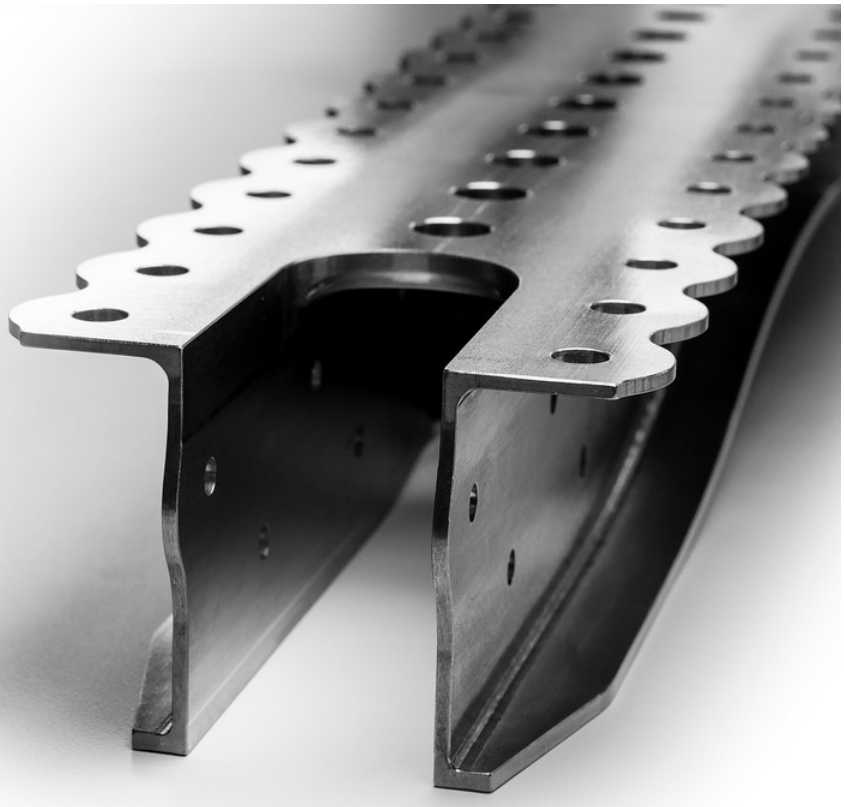
- Leader in innovation with **strong Intellectual Property** position
- **Industry leading brands** including Camloc® and Huck®
- Dedicated **R&D** facilities
- Consistent **track record of anticipating the needs of our customers**
- **Partner of choice** for next generation applications
- Focus on **Increasing Automation** in the production process

Differentiated technologies and solutions to continue driving content gains

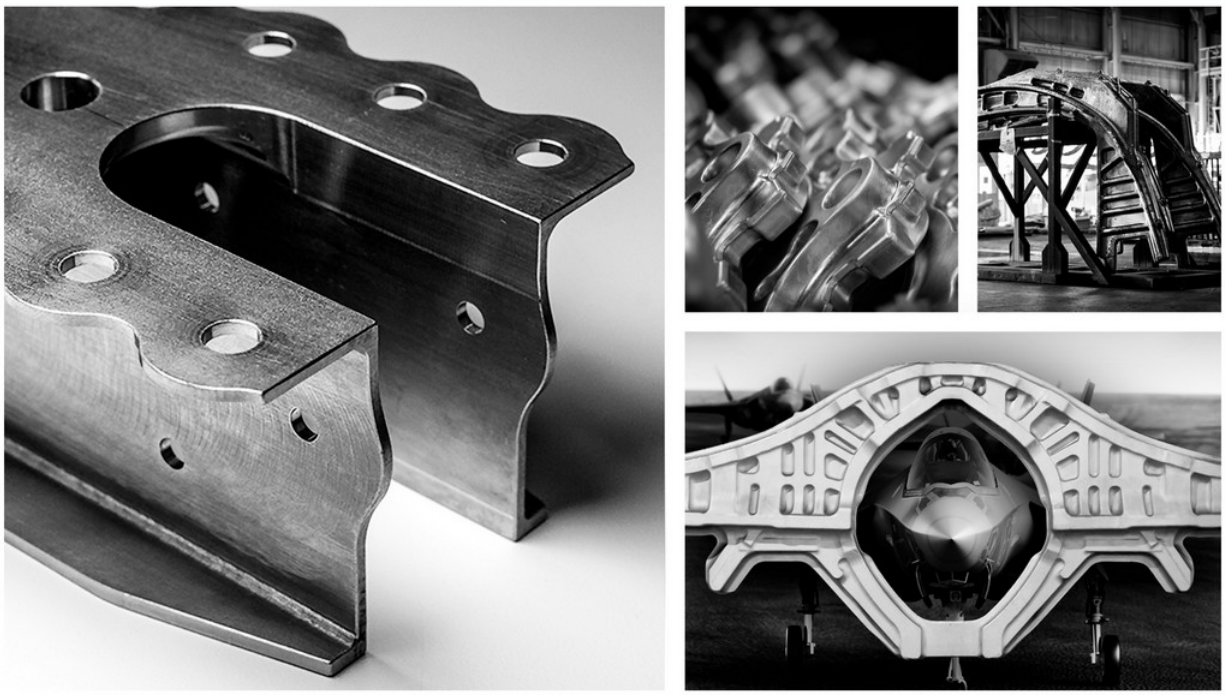
HOWMET AEROSPACE

Engineered Structures

HOWMET AEROSPACE



Engineered Structures Video



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Engineered Structures: Multiple Techniques to Meet Customer Needs

Market Needs:

- Improved Fuel Efficiency
- Reduced Emissions
- Predictable Overhaul Cycles
- Speed to Market

Major Drivers to Achieve:

- Operating Temperature
- Compatibility with Composites
- Environmental Resistance
- Component Integrity
- Model Based Manufacturing
- Reduced Weight & Near-Net-Shapes

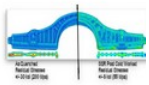
We Deliver Through:

- Monolithic Forgings
- Proprietary Ti, Al-Li & Al Alloys
- Ti Extrusions
- Hi Temp Super Alloy Forgings
- Digital Manufacturing and Automation

F-35 Bulkhead


Al-Li Forged Fan Bla


Seat Tracks


Signature Stress Relief

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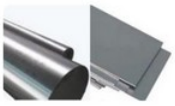
Ti = Titanium, Al = Aluminum, Li = Lithium

Engineered Structures: Global Leader in Aerospace & Defense Structures

Market Segment	Products (In Order of Differentiation)		Competitive Position	Highlights	Revenue % of FY21 To
Ti-Mill Structures	■ Plate / Sheet ■ Billet / Bloom ■ Ingot ■ Value Add Ti Services		1 NUMBER ONE Aerospace Defense Structures	■ Vertically integrated with alloys, forging, extrusion, forming, machining and assembly solutions	
Al, Ti, Super Alloy Forgings	■ Fan Blades ■ Aero Wheel and Brake ■ Large Al ■ Engine Disks ■ Large Ti		1 NUMBER ONE Aerospace Defense / Wheel and Brake	■ Industry leader in large monolithic, wheel and brake, and fan blade forgings ■ Proprietary Alloys and Processes: Al-Li fan blades, 7085 alloy for large monolithic forgings	
Ti Extrusions and Machining	■ Seat Track ■ Raw / Machined Large Ti Extrusions ■ Machined Ti Plate		1 NUMBER ONE Aerospace Ti Extrusions and Seat Tracks	■ Leader in vertical integrated solutions for Ti Extrusion Machining and assembly	
Al Machining and Assembly	■ Radar Structures ■ Machined Al Structures ■ Machined Al Components			■ Leader in large complex defense Al assemblies ■ Expertise in machining and assembly of aerospace forgings, castings and plate	

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~80% of Revenue Under Long-Term Agreements (LTAs)

Proprietary Alloys & Processes with Robust & Unique Assets

Patented & Proprietary Alloys and Processes

Patented 7085 applications and Monolithic Forgings

Aluminum Lithium Forging Alloys and **Process Patents**

HOWMET THOR© Advanced Titanium Alloy

Proprietary Quench Process for Isothermal Engine Forgings

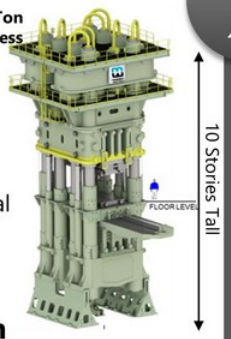
FSW (Friction Stir Welding) Radar Structures

Ti **Fine Grain Sheet** (FGS) Products

Robust & Unique Assets "Ramp Up Ready"

Forgings

50,000-Ton Press
35,000-Ton Press
33,000-Ton Press
15,000-Ton Press
19,000-Ton Isothermal



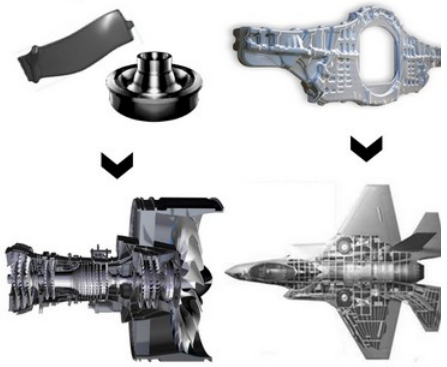
Melt, Machine, Extrude & Form

Vacuum Arc Re-melting Furnaces
Plasma Arc Furnaces
Electronic Beam Furnace
Titanium Reversing Rolling Mill
Ti Extrusion Presses including 5,500-Ton

Key Products for Lightweight Structures and Highly Efficient Engines

Forged Fan Blades and Engine Disks

Ti and Al-7085 F-35 Bulkheads



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Isothermal Forging Press and Heat Treat Cell

Unique Forging Capabilities for Most Challenging Engine Applications

Near-net shape isothermal forging in vacuum to **meet newest jet engine requirements**

Unique isothermal forging press with **"quick" die change capability**

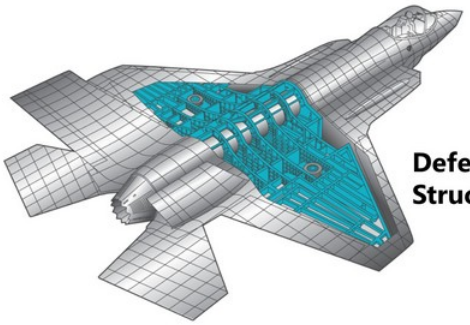
High Speed Air System quench cell

Allows localized contr
of quench rate to **achieve required balance of material properties and residual stresses**

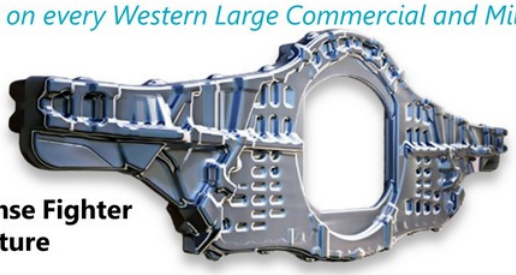
HOWMET AEROSPACE

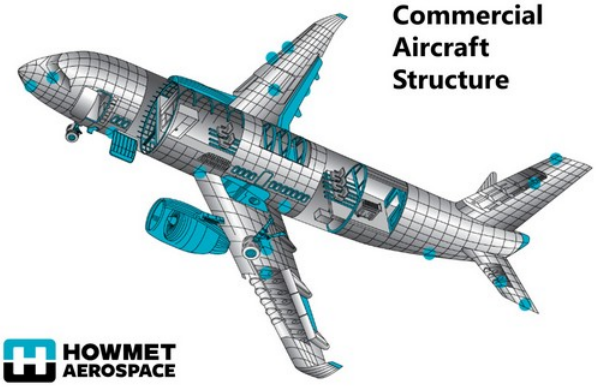
Multi-Material & Multi-Process Expertise for Aero Structural Applications

We have products on every Western Large Commercial and Military Aircraft Platform

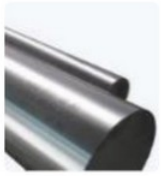


Defense Fighter Structure





Commercial Aircraft Structure



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Aluminum & Titanium Die Forgings

- **400 lbs weight savings** and **20% cost sav**
  compared to built-up structure on F-35 bul
- Leading producer of Aircraft Wheel and Bra
  Forgings
- Leading producer of Aluminum Engine Fan

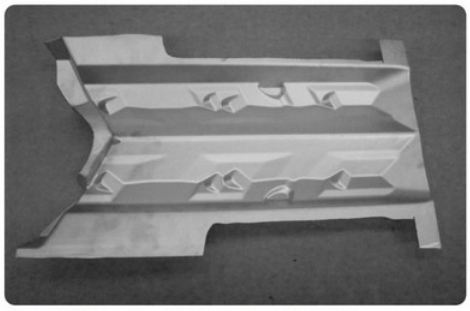
Differentiated Titanium Products

- Proprietary HOWMET-THOR© alloy for airc
  engine, pylon and heat shield applications
  providing **weight (up to 30%) savings**
- Fine Grain Sheet products in multiple Ti-all
  enables forming of complex Ti-parts at low
  temperatures **(up to 200°F)**
- Leading Ti extrusion capabilities including
  stretch forming which offers significant cos
  savings **(up to 15%)**

Differentiated Ti-Sheet Products

Fine Grain Sheet Reduces Overall Cost of Superplastic Forming Titanium Complex Shapes

- Mill-friendly **Fine Grain Sheet in** multiple Ti-alloys
- Targeted at **pylon and heat shield** applications
- Enables forming of **complex Ti-parts at lower temperatures (up to 200°F)**
- Enables **more complex shapes** and thinner gauges
- Provides **cost savings and enhanced tool life**



Courtesy: Boe

HOWMET AEROSPACE

Engineered Structures: Key Messages

- **Global Market Leader**:
  - **Large Aluminum and Titanium Forgings**
  - **Aircraft Wheel & Brake Forgings**
  - **Forged Aluminum Fan Blades**
  - **Ti Mill Products**

- Leading market positions are supported by **Patented and Proprietary Alloys and Processes** supported by **Robust & Unique Assets**
- Well positioned for **Growth** on both **Metal Intensive** and **Composite Structures** through **Differentiated Titanium and Aluminum** solutions
- Unique capabilities for **Critical Engine Applications** including near-net shape isothermal forg

Forged Wheels

HOWMET
AEROSPACE

Forged Wheels Video

HOWMET AEROSPACE

Forged Wheels

Expertise and Market Position

- **Brand:** Most recognized truck wheel globally
- **Patents:** Over 150 patents and trade secrets
- **Unmatched Global Scale**
- **Most applications, models, and wheel designs**
- **Powertrains -> Fossil, electric, fuel cell**
  - Megatrends require Aluminum Wheels

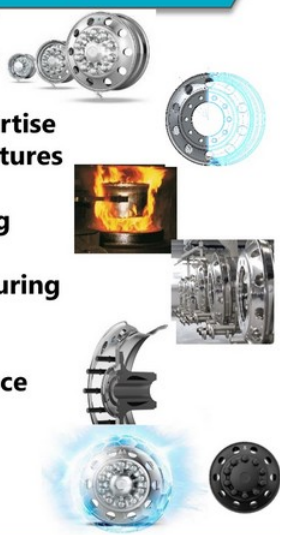
Differentiation

- **Differentiated products**; Not make to pri like automotive
- Sold through to **Major Fleets**
- **4X capacity** of next global competitor through 6 major manufacturing locations

HOWMET AEROSPACE

Forged Wheels: Meeting Multiple Customer Needs

Market Needs:	Major Drivers to Achieve:	We Deliver Through:
Fuel Efficiency	Weight Optimization	Proprietary Alloy
Payload	Product Integrity	Engineering Expertise and Patented Features
Reduced Emissions	Value-Based Features	Advanced Forging
Enhanced Aesthetics		Digital Manufacturing and Automation
Reduced Maintenance		Proprietary Surface Treatments
Reliability		Flexible Global Footprint
Resale Value		



HOWMET AEROSPACE

Up to 1,400 Pounds of Weight Savings from Replacing 18 Steel Wheels with Aluminum

Forged Wheels: Global Leader in Aluminum Forged Wheels

Market Segment	Products	Competitive Position	Highlights	Revenue % of FY21 T
North America	■ Ultra ONE® ■ Dura-Bright® ■ Integrated Aerodynamic Solutions ■ vHub® Bore Technology	1 NUMBER ONE	■ Howmet aluminum wheel **market share ~75%** ■ Proprietary MagnaForce® Alloy enables continued light-weighting across global portfolio ■ 70+ years of Alcoa® Wheels brand development	
Europe	■ Dura-Bright® ■ LvL ONE® Finish ■ Ultra ONE®	1 NUMBER ONE	■ Howmet aluminum wheel **market share ~90%** ■ Image-concious customer base drives high adoption of Dura-Bright® surface treatment ■ Expansion in Hungary adds low-cost global capacity	
Other Regions	■ Dura-Bright® ■ LvL ONE® Finish ■ Ultra ONE®	1 NUMBER ONE	■ Howmet aluminum wheel **market share ~25%** ■ Expanding Dura-Bright® surface treatment portfolio offerings ■ World-class competency in complying with rigorous local certification requirements	

HOWMET AEROSPACE

Greater Than 50% of Revenue Under Long-Term Agreements (LTAs)

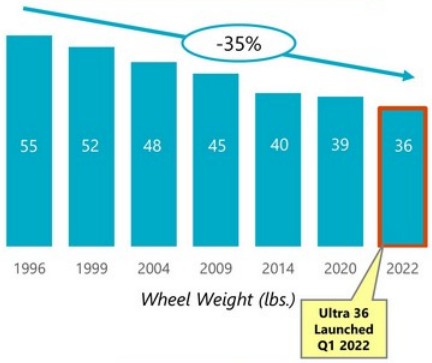
Forged Wheels: Technology – More Than Just Metal

Alloy	■ MagnaForce® alloy ■ Developed specifically for truck wheels
Design	■ Lightest global wheel portfolio ■ Integrated aerodynamic solutions ■ vHub™ bore technology ■ Dual valves
Process	■ State of the art equipment ■ Proprietary heat treat, machining and finishing processes ■ >150 Patents + trade secrets
Surface Treatments	■ Dura-Bright® ■ Dura-Black™ ■ Dura-Flange® wear protection ■ Mirror Polish

HOWMET AEROSPACE

1) Statistics for Class 8 trucks

Lighter = Lower Cost for Howmet and Higher Value for Fleets



Superior Finishes

Reflective Clarity Comparison

Customer Benefits

- 45% lighter than steel wheels
- 5X stronger than steel wheels
- Up to 5% improved fuel efficiency[1]
- Up to 1,400 pounds of weight savings vs steel
- Up to 3% greater payload capacity[1]
- Increased truck residual value
- No rust = lower maintenance
- Premium image
- Quality

Forged Wheels: Innovations

Ultra ONE® 36: Industry's Lightest Wheel

- **36 Pound** Wheel with **Patent pending** design
- Proprietary **MagnaForce®** Alloy
- **7,400 lbs** load capacity
- **Five year** unlimited mile warranty

Aerodynamic Steer and Drive Cover

- Easy **installation, maintenance** and **inspe**
- **Minimizes drag**
- Improves **fuel efficiency** saving up to 1.3 gallons of fuel per 1,000 miles

HOWMET AEROSPACE

ALCOA WHEELS

MAXIMIZE the Drive.™

Forged Wheels: Product Integrity

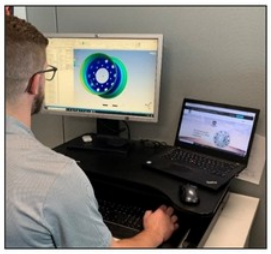
- Rigorous product validation and certification process
- Track testing and fleet trials
- Best in Class analysis and testing tools
- Product and Process 3rd party certified
- Multiple regional wheel certification standards
- **Quality: Single digit PPM**

HOWMET AEROSPACE

PPM = Parts Per Million

Long Term Durability Test

700,000 miles simulated - 2X normal loading to test durability



Finite element analysis to optimize strength and weight

High Impact Test

2,200 Lb weight dropped from 20 feet to test impact resistance

Aluminum Wheels are the Perfect Partner for Alternative Energy Vehicles

Megatrends (Sustainability)

- Electric Vehicles
- Fuel Cell Vehicles
- Decarbonization Initiatives
- Fuel Emissions Regulations
- Greenhouse Gas Emissions Standards
- Sustainable City Transportation

Trucks are getting heavier.

Every pound counts.

Freightliner eCascadia Electric Truck on Alcoa® Wheels

47% lighter than steel = freight efficiency

Offset added weight = extend battery life

The aluminum wheel is the single most effectiv product for saving weight.

(Source: NACFE Confidence Report: Lightweighting, Jan. 2021

Alcoa® Wheels Offset Added Weight

- Increase freight efficiency
- Increase fuel economy
- Extend battery life & range
- Aluminum is 100% recyclable
- Closed loop aluminum and ingot casting operations

HOWMET AEROSPACE

Emission Reduction Goals are a Secular Tailwind for Aluminum Wheels

Governments are Mandating Environmental Policies

- European Green Deal (2019); Target EU Greenhouse Gas neutral by 2050
- Truck OEMs responsible to reduce emissions by **50% in 2030**

Zero Emission Vehicles to Increase in Prevalence

- **51%[1] of European truck sales** (light, medium, heavy duty) will be zero emissions by 2030
- **Challenge:** Fuel cell electric and battery electric trucks weigh significantly more than diesel trucks (Estimates are 6,000-12,000 pounds more)

Weight and Aerodynamic Improvements Required

- Powertrains are becoming heavier and more expensive
- Light weighting and aerodynamic improvements required to meet range and payload capacity needs
- **OEMs face large fines for failing to meet the required standards**

Alcoa® Wheels offer a so
to OEMs striving to meet
requirements while retair
optimal performance

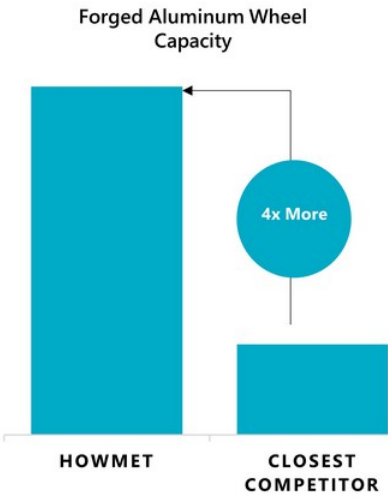
HOWMET AEROSPACE

1) Source Boston Consulting Group

Global Scale - Unmatched Global Network Creates Cost Advantage

- **4x more capacity** than next largest competitor
- Majority of capacity is in **low-cost countries**
- **Full control** of our value chain from molten metal to finished product
- **Rapid global deployment** of innovations like Ultra ONE® and Dura-Bright®
- **Larger global commercial network** than any competitor

- *Manufacturing Operations*
- *Distribution & Commercial Operations*



HOWMET AEROSPACE

Forged Wheels: Key Messages

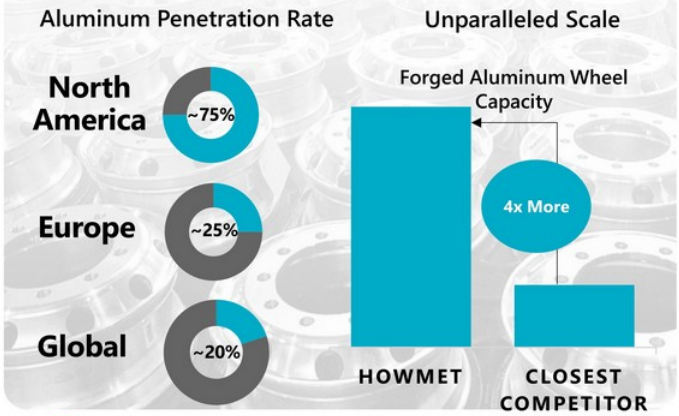
Technology Advantage

- **Strongest and lightest commercial vehicle wheels portfolio** in the world
- Protected globally by **patents, trade secrets, and extensive expertise**

HOWMET AEROSPACE

Growth Opportunity | Global Scale

- **Largest** heavy duty forged aluminum wheel producer
- **Only true global player** in the segment



Brand

- Alcoa® Whee is the **most recognized truck wheel brand** globall

ALCOA WHEELS

MAXIMIZE the Drive.™

Financial Overview

Progress 2019 - 2021

Capital Discipline

- **Gross debt reduction** of **~$2.1B** over last 3 years; ~**$845M** in 2021
- **Annualized interest savings** of **~$110M** through debt actions over last 3 years; ~$70M in 2021
- **Share repurchases** of **~$1.7B** over last 3 years; **$430M** in 2021
- **Pension Net liability reduction of** ~25%
- **Pension and OPEB** cash contributions expected to improve from ~$240M in 2020 to ~$60M in 2022

See Appendix for reconciliations

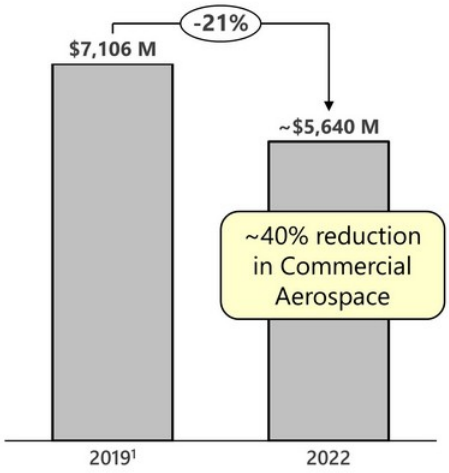
Commercial / Operational Excellence

- 2021 Commercial Aerospace Revenue ~50% relative to 2(
- **Top decile Adjusted EBITDA Margin versus Aerospace**
- Improved Adjusted EBITDA Margin above pre-pandemic l from 22.1% in 2019 to **22.8%** in 2021
- **~$437M** of structural cost savings in 3 years; **~$130M in**
- **~$214M** of price increases in 3 years; ~**$97M in 2021**
- **114%** Adj Free Cash Flow Conversion in 2020 & **117%** in

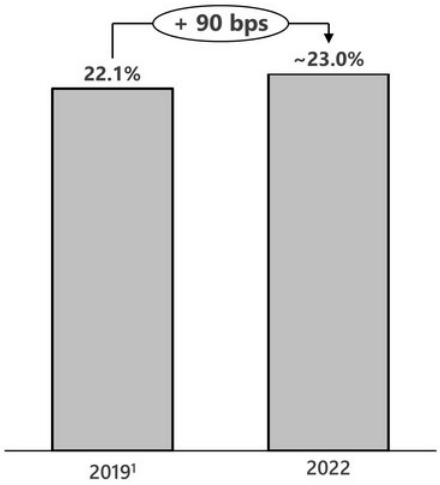
HOWMET AEROSPACE

2019[1] vs 2022[2]: ~21% Revenue Reduction, ~90 bps Margin Increase; ~8% Adjusted EPS Incre

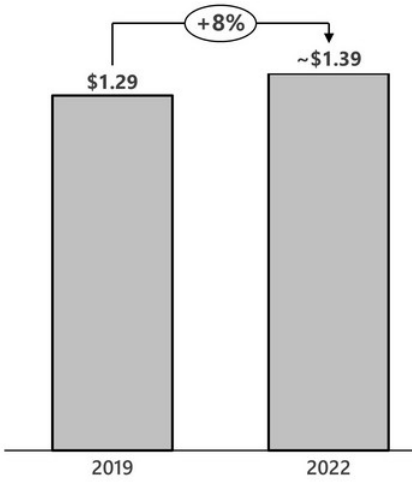
~21% Reduction in Revenue



~90 bps Improvement in Adjusted EBITDA Margin



~8% Increase in Adjusted EPS



1) 2019 Pro forma 2) 2022 Guidance

See Appendix for reconciliations

HOWMET AEROSPACE

Strategy Underpinned by Operating Play Book for Enhanced Margins & C

Operational Discipline

- Continue to **flex variable costs**
- Strict focus on **maintaining fixed cost reductions**
- Daily Centralized **Purchasing Tracking**
- **Accounts Receivable 95%+ current**
- Basic **lean manufacturing, asset utilization discipline**
- **Capex prioritization** with CEO/CFO approval

Commercial Discipline

Disciplined Approach to Price

- Long term agreements **approved by CEO &**
- **2022-2024 LTAs** reviewed at regular cadence

Talent Management

- Annual **Talent and Succession Plan** Reviews
- **Performance and Compensation** Reviews

Quality

- **Best in Class Quality**
- **Independent Internal Product Quality Aud**

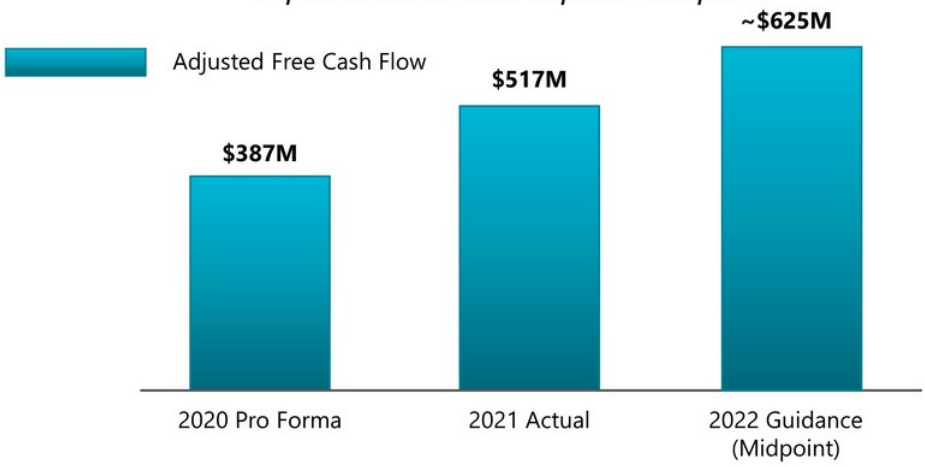
HOWMET AEROSPACE

Segment Adjusted EBITDA Margin

	2019	2020	2021	Q1 22	Future	
Engine Products	**22.7%**	**22.4%**	**24.7%**	**27.4%**		• Increased Airfoil sophistication • Recovery of Rings volumes • Efficiency and throughput
Fastening Systems	**28.4%**	**23.7%**	**22.9%**	**21.2%**		• Widebody recovery • Efficiency and throughput
Engineered Structures	**14.2%**	**13.5%**	**14.2%**	**12.6%**		• Widebody recovery • Product line portfolio balance • Benefits of efficiency programs
Forged Wheels	**29.4%**	**28.3%**	**31.9%**	**27.1%**		• Higher volumes • Industry recovery / electrification • Metal inflation steadying / potentially declining

Capital Discipline & Operational Excellence Driving Free Cash Flow Improven

Improving adjusted free cash flow driven by operational improvements and capital discipline



	2020 Pro Forma	2021 Actual	2022 Guidance (Midpoint)
Adjusted Free Cash Flow Conversion	**114%**	**117%**	**~110%**

See Appendix for reconciliations

HOWMET AEROSPACE

Consistent, Sustainable Free Cash Flow Generation

- **Adjusted EBITDA margins improved ~220 basis points in 2021 YoY driving higher Adjusted Free Cash Flow Yield**
- **Pension and OPEB** cash contributions expected to improve from ~$240M in 2020 to **~$60M in 2022**
- Debt actions taken in 2021 **reduced annualized interest expense by ~$70M**
- **Adjusted Free Cash Flow Conversion well above long-term target of ~90%**

Balanced Capital Allocation Strategy

Capex

- Focus on automation projects to improve yields and mitigate labor risk
- Capex less than depreciation in the near term; net source of cash

Debt Paydown

- Long-term Leverage Target 1.5x-2.0x Net Debt / Adj. EBITDA
- Opportunistically Reduce Debt, Gross Pension and OPEB liabilities

Return Cash to Shareholders

- Continue to buy back shares of common stock driven by cash generation
- Reinstated $0.02 quarterly common stock dividend in Q3 2021
- ~$1.2B Board Authorization for share repurchases[1]

Potential Bolt-on Acquisitions

- Opportunistic possibilities for Engine Products or Fastening Systems to enhance competitive advanta

1) As of April 1, 2022

Howmet Aerospace Strategy

Focus on what we are good at to drive **growth above market rate**

Prioritize major differentiated products for resource allocation

Underpin strategy with **commercial and operational discipline**

Execute a **disciplined capital allocation strategy**

HOWMET AEROSPACE

Howmet Aerospace Management Team

John Plant, Executive Chairman & Chief Executive Officer

- Held his role as CEO since February 2019.
- Mr. Plant has served as a director since 2016 and Chairman of the Board since 2017.
- Mr. Plant is the former Chairman of the Board, President and Chief Executive Officer of TRW Automotive, which was acquired by ZF Friedrichshafen AG in May 2015.
- Mr. Plant also serves as a director of Jabil Circuit Corporation and Masco Corporation.

Ken Giacobbe, EVP & Chief Financial Officer

- Held his role since the company's separation from Alcoa Corp. in 2016.
- Prior to separation, Mr. Giacobbe served as Divisional CFO of Alcoa's Engineered Products and Solutions division.
- Joined the Company in 2004 as Vice President of Finance for Global Extruded Products.
- M.B.A. from the University of South Florida and B.S. in Economics from State University of New York at Oneonta.

Lola Lin, EVP, Chief Legal Officer and Secretary

- Held her role since July 2021.
- Prior to joining Howmet Aerospace, Ms. Lin served as SVP and General Counsel of Airgas.
- Ms. Lin previously held various legal roles at Air Liquide, Dell Inc. and Locke Liddell & Sapp LLP.
- J.D. from the University of Houston College of Law and B.A. from the University of Texas.

Neil Marchuk, EVP, Human Resources

- Held his role since February 2019.
- Prior to joining Howmet Aerospace, Mr. Marchuk had been Executive Vice President and Chief Human Resources Officer at Adient.
- Mr. Marchuk previously served as EVP of Human Resources at TRW from 2004 to 2015.
- M.A. from the University of the West of Scotland and B.A. in Commerce from University of Windsor.

Michael Chanatry, VP, Chief Commercial Officer

- Held his role since 2018.
- Prior to joining Howmet Aerospace, Mr. Chanatry served in commercial and military market roles at General Electric and Lockheed Martin.
- B.A. from Niagara University.

HOWMET AEROSPACE

Howmet Aerospace Management Team (continued)

Merrick Murphy, President, Engine Products

- Held his current role since March 2022.
- Prior to this appointment, Mr. Murphy was President, Engineered Structures.
- Previously, Mr. Murphy was President, Forged Wheels.
- Mr. Murphy joined the company in 1997.
- B.A. in Business Administration from Loyola University, in Chicago.

Vitaliy V. Rusakov, President, Fastening Systems

- Held his role since 2010.
- Mr. Rusakov had served as Chief Operating Officer for Arconic Engineered Products and Solutions.
- Mr. Ruskov began his career in the fastening business in 1998.
- M.B.A. from Georgetown University and INSEAD, B.A. in International Economics from Kiev University of Economics and B.A. in Linguistics and Education from Kiev University of Linguistics.

Randall Scheps, President, Forged Wheels

- Held his current role since March 2020.
- Joined the company in 2006.
- Previously held a variety of roles at Ford Motor Company and Visteon in product engineering, strategic planning and operations leadership.
- MBA from the University of Michigan and a B.A in Mechanical Engineering from the University of Texas.

Ramiro Gutierrez, President, Engineered Structures

- Held his role since March 2022.
- Joined the company as Vice President Sales and Marketing, Engine Products in 2021.
- Previously he was Vice President of Sales in the Active Safety & User Experience Division at Aptiv.
- Degree in in Business Administration from Vigo & Santiago de Compostela University in Vigo, Spain, and graduate of Executive LEAD program University of Michigan's Ross Business School.

HOWMET AEROSPACE

Q&A

John C. Plant
Executive Chairman & CEO

Ken Giacobbe
EVP & Chief Financial Officer

Merrick Murphy
President, Engine Products

Vitaliy Rusakov
President, Fastening Systems

Randall Scheps
President, Forged Wheels

Ramiro Gutierre
President, Engineered S

HOWMET AEROSPACE

Appendix

2022 Guidance

	Q2 2022 Guidance			FY 2022 Guidance			What we expect in 2022
	Low	Midpoint	High	Low	Midpoint	High	
Revenue	**$1.350B**	**$1.370B**	**$1.390B**	**$5.560B**	**$5.640B**	**$5.720B**	▪ FY 2022 Revenue up ~13% vs. FY 2021, includes material pass through
Adj EBITDA[1]	**$302M**	**$310M**	**$318M**	**$1.265B**	**$1.300B**	**$1.335B**	▪ FY 2022 Adj EBITDA up ~15% vs. FY 20
Adj EBITDA Margin[1]	*22.4%*	*22.6%*	*22.9%*	*22.8%*	*23.0%*	*23.3%*	▪ FY 2022 Adj EPS up ~38% vs. FY 2021
Adj Earnings per Share[1,2]	**$0.31**	**$0.32**	**$0.33**	**$1.33**	**$1.39**	**$1.45**	▪ Pension/OPEB Contributions of ~$60M ▪ Capex of $220M - $250M vs. Depreciat and Amortization of ~$270M
Free Cash Flow				**$575M**	**$625M**	**$675M**	▪ Free Cash Flow Conversion ~110%

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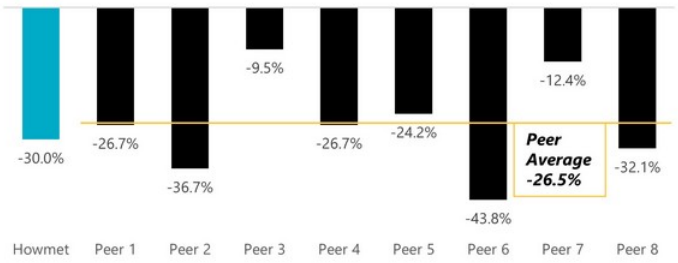
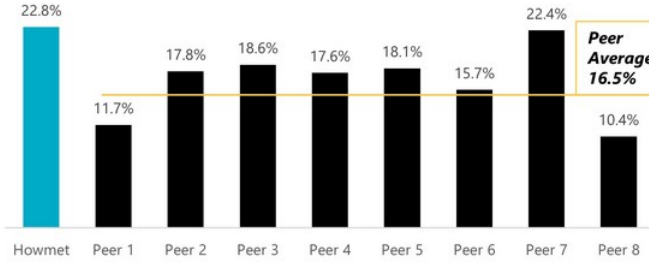
1) Excluding special items 2) Assumes ~$2M per Quarter of deferred comp and other expenses in FY 2022

Superior Margin Performance During the Aerospace Downturn

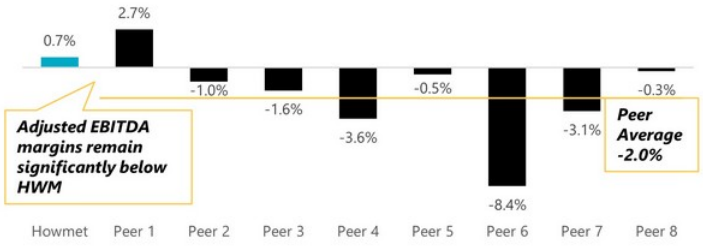
Revenue Change 2019-2021



Adjusted EBITDA Margin 2021



Adjusted EBITDA Margin Change 2019-2021



Actions Protect Margin Decline, Position for Ramp

- Effective variable cost flexing in response to revenue declines
- Structural cost reductions of ~$130M in FY21, followi ~$197M in FY20
- Net pricing gains of ~$97M in FY21

Focus on strong incremental margins as volumes retur

HOWMET AEROSPACE

Source: Goldman Sachs analysis. Peers include Allegheny Technologies (ATI), Hexcel, Meggitt, MTU Aero, RBC Bearings, Rolls Royce, Safran, Woodward. Note: Financials are calendarized to December.

Reconciliation of Income from Continuing Operations Excluding Special Items

($ in millions, except per-share amounts)	FY 2019	FY 2020	FY 2021
Income from continuing operations	$126	$211	$258
Diluted EPS	$1.03	$0.48	$0.59
Special items:			
Restructuring and other charges	$582	$182	$90
Discrete tax items[1]	$(25)	$(115)	$9
Other special items:			
Debt tender fees and related costs	—	65	147
Impairment of energy business assets	10	—	—
Costs, including interest, associated with the Arconic Inc. Separation Transaction	5	14	—
Plant fire costs (reimbursements), net	9	3	(3)
Release of tax indemnification receivable	—	53	—
Legal and other advisory costs (reimbursements) related to Grenfell Tower, net	8	(12)	(4)
Strategy and portfolio review costs	6	—	—
Costs associated with closures, shutdowns, and other items	—	3	35
Reversal of state investment tax credits	—	9	—
Other tax items	(1)	—	—
Total Other special items	$37	$135	$175
Tax impact[2]	$(130)	$(59)	$(90)
Income from continuing operations excluding Special items	$590	$354	$442
Allocation adjustments[3]		$(13)	
Income from continuing operations excluding Special items and Allocation adjustments		$341	
Diluted EPS excluding Special items	$1.29	$0.80	$1.01
Diluted EPS excluding Special items and Allocation adjustments		$0.77	

Income from continuing operations excluding Special items, Income from continuing operations excluding Special items and Allocation adjustments, Diluted EPS excluding Special items, and Dilu
excluding Special items and Allocation adjustments are non-GAAP financial measures. Management believes that these measures are meaningful to investors because management reviews the c
results of the Company excluding the impacts of Restructuring and other charges, Discrete tax items, and Other special items (collectively, "Special items"). In addition, management believes that
from continuing operations excluding Special items and Allocation adjustments and Diluted EPS excluding Special items and Allocation adjustments are meaningful to investors as it reflects how
reviewed the standalone costs of Howmet in the quarter ended March 31, 2020 as if the Arconic Inc. Separation Transaction had happened on January 1, 2020. There can be no assurances that
Special items will not occur in future periods. To compensate for this limitation, management believes that it is appropriate to consider both Income from continuing operations determined unde
well as Income from continuing operations excluding Special items.

(1) Discrete tax items for each period are discussed further on the Reconciliation of the Operational Tax Rate.

(2) The tax impact on Special items is based on the applicable statutory rates whereby the difference between such rates and the Company's consolidated estimated annual effective tax rate is
Special item.

HOWMET AEROSPACE

(3) Adjustments include differences between allocations as required under discontinued operations as part of generally accepted accounting principals and estimated actual spending in selling, general administrative, and other expenses, and miscellaneous non-operating income related to pension, other post retirement benefits, and foreign exchange related to Howmet on a standalone basis as if the Arconic Inc. Separation Transaction had occurred on January 1, 2020.

Reconciliation of 2021 Adjusted Free Cash Flow

($ in millions)	FY 2021
Cash provided from operations	$449
Cash receipts from sold receivables	267
Capital expenditures	(199)
Adjusted free cash flow[1]	$517

The net cash funding from the sale of accounts receivables was neither a use of cash nor a source of cash in the period presented.

In the third quarter of 2021, the Company restructured its accounts receivable securitization. As a result, going forward, Cash receipts from sold receivables (which had been included in the investing section of the Statement of Consolidated Cash Flows) will be $0 as the entire impact of the accounts receivable securitization program will be included in the Cash provided from operations section of the Statement of Consolidated Cash Flows. Consequently, for the fourth quarter 2021 and full year 2022, the definition of Adjusted free cash flow is Cash provided from operations less Capital expenditures.

Adjusted free cash flow is a non-GAAP financial measure. Management believes that this measures is meaningful to investors because management reviews cash flows generated from operations after taking into consideration capital expenditures (due to the fact that these expenditures are considered necessary to maintain and expand the Company's asset base and are expected to generate future cash flows from operations), as well as cash receipts from net sales of beneficial interest in sold receivables. It is important to note that Adjusted free cash flow does not represent the residual cash flow available for discretionary expenditures since other non-discretionary expenditures, such as mandatory debt service requirements, are not deducted from the measure.

[1] Record since April 2020 separation; FY 2021: Cash used for financing activities = ($1,444M) and Cash provided from investing activities = $107M.

HOWMET AEROSPACE

Reconciliation of 2020 Adjusted Free Cash Flow

($ in millions)	FY 2020
Cash provided from operations	$9
Cash receipts from sold receivables	422
Capital expenditures	(267)
Adjusted free cash flow[1]	$164
Costs associated with the Arconic Inc. Separation Transaction	77
Allocation adjustments[2]	146
Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction	$387

The net cash funding from the sale of accounts receivables was $329 million in the first quarter of 2020 which represented a $21 million use of cash in the first quarter. The net cash funding from the sale of accounts receivables was $299 million in the second quarter of 2020 which represented a $30 million use of cash in the second quarter. The net cash funding from the sale of accounts receivables was $255 million in the third quarter of 2020 which represented a $45 million use of cash in the third quarter. The net cash funding from the sale of accounts receivables was $250 million in the fourth quarter of 2020 which represented a $5 million use of cash in the fourth quarter.

During the third quarter ended September 30, 2020, the Company identified a misclassification in the presentation of changes in accounts payable and capital expenditures in its previously issued Statement of Consolidated Cash Flows. Although management has determined that such misclassification did not materially misstate such prior financial statements, the Company has revised its Statement of Consolidated Cash Flows for the twelve months ended December 31, 2019 resulting in an increase of $55 to previously reported capital expenditures within cash provided from investing activities with a corresponding offset in accounts payable, trade within cash used for operations. The Company also revised its Statement of Consolidated Cash Flows to increase its previously reported capital expenditures with a corresponding offset in accounts payable, trade of $74 which is reflected in the twelve months ended December 31, 2020 above.

Adjusted free cash flow and Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction are non-GAAP financial measures. Management believes that these measures are meaningful to investors because management reviews cash flows generated from operations after taking into consideration capital expenditures (due to the fact that these expenditures are considered necessary to maintain and expand the Company's asset base and are expected to generate future cash flows from operations), cash receipts from net sales of beneficial interest in sold receivables, as well as costs associated with the Arconic Inc. Separation Transaction. It is important to note that Adjusted free cash flow and Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction, measures do not represent the residual cash flow available for discretionary expenditures since other non-discretionary expenditures, such as mandatory debt service requirements, are not deducted from the measure.

(1) 2Q 2020 – 4Q 2020 (GAAP): Cash used for financing activities = ($1,514M) and Cash provided from investing activities = $260M. FY 2020 (GAAP): Cash used for financing activities = ($369M) and Cash provided from investing activities = $271M.

(2) Adjustments include differences between allocations as required under discontinued operations as part of generally accepted accounting principles and estimated actual spending in cash provided from operations and capital expenditures related to Howmet on a standalone basis as if the Arconic Inc. Separation Transaction had occurred on January 1, 2020.

HOWMET AEROSPACE

Reconciliation of Adjusted EBITDA Excluding Special Items and Allocation Adjustm

($ in millions)	FY 2019	FY 2020	FY 2021
Income from continuing operations after income taxes	$126	$211	$258
Add:			
Provision (benefit) for income taxes	$84	$(40)	$66
Other expense, net	31	74	19
Loss on debt redemption	—	64	146
Interest expense	338	317	259
Restructuring and other charges	582	182	90
Provision for depreciation and amortization	295	279	270
Adjusted EBITDA	$1,456	$1,087	$1,108
Add:			
Costs associated with the Arconic Inc. Separation Transaction	$5	$7	$—
Plant fire costs (reimbursements), net[1]	9	(3)	(4)
Legal and other advisory costs (reimbursements) related to Grenfell Tower, net	8	(12)	(4)
Costs associated with closures, shutdowns, and other items	—	3	35
Allocation adjustments[2]	90	1	—
Adjusted EBITDA excluding Special items and Allocation adjustments	$1,568	$1,083	$1,135
Sales	$7,098	$5,259	$4,972
Allocation adjustments[2]	8	(2)	—
Third-party sales with Allocation adjustments	$7,106	$5,257	$4,972
Adjusted EBITDA Margin excluding Special items and Allocation adjustments	22.1%	20.6%	22.8%

The Company's definition of Adjusted EBITDA (Earnings before interest, taxes, depreciation, and amortization) is net margin plus an add-back for depreciation and amortization. Net margin is equ Sales minus the following items: Cost of goods sold, Selling, general administrative, and other expenses, Research and development expenses, and Provision for depreciation and amortization. Management believes that Adjusted EBITDA, Adjusted EBITDA excluding Special items and Allocation adjustments, and Adjusted EBITDA Margin excluding Special items and Allocation adjustme meaningful to investors because it provides additional information with respect to the Company's operating performance and the Company's ability to meet its financial obligations. The Adjusted presented may not be comparable to similarly titled measures of other companies.

(1) Plant fire costs excludes the impacts of $6 of depreciation in the second quarter ended June 30, 2020.

(2) Adjustments include differences between allocations as required under discontinued operations as part of generally accepted accounting principals and estimated actual revenue and spending in selling, general administrative, depreciation, depletion, and other expenses related to Howmet on a standalone basis as if the Arconic Inc. Separation Transaction had occurred in each year on January 1, 2019 or January 1, 2020, respectively.

Reconciliation of 2021 Operational Tax Rate

($ in millions)	Year ended December 31, 2021		
	As reported	Special items [1][2]	As adjusted
Income from continuing operations before income taxes	**$324**	**$265**	**$589**
Provision for income taxes	**$66**	**$81**	**$147**
Operational tax rate	**20.4%**		**25.0%**

Operational tax rate is a non-GAAP financial measure. Management believes that this measure is meaningful to investors because management reviews the operating results of the Company excluding the impacts of Special items. There can be no assurances that additional Special items will not occur in future periods. To compensate for this limitation, management believes that it is appropriate to consider both the Effective tax rate determined under GAAP as well as the Operational tax rate.

(1) Special items for the year ended December 31, 2021 include debt tender fees and related costs $147, Restructuring and other charges $90, and costs associated with closures, shutdowns, and other items $35, partially offset by ($4) reimbursement related to legal and advisory charges related to Grenfell Tower and ($3) net reimbursement related to fires at two plants.

(2) Tax Special items includes discrete tax items, the tax impact on Special items based on the applicable statutory rates, the difference between such rates and the Company's consolidated estimated annual effective tax rate and other tax related items. Discrete tax items for the period included the following:

- for the year ended December 31, 2021, a net benefit related to prior year amended returns and audit settlements ($14), a charge related to prior year foreign earnings distributed or no longer considered permanently reinvested $13, a net charge related to valuation allowance adjustments $9, and a net charge for other items $1.

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Reconciliation of 2020 Operational Tax Rate

($ in millions)	Year ended December 31, 2020		
	As reported	Special items [1][2]	As adjusted
Income from continuing operations before income taxes	**$171**	**$317**	**$488**
Provision for income taxes	**$(40)**	**$174**	**$134**
Operational tax rate	**(23.4)%**		**27.5%**

Operational tax rate is a non-GAAP financial measure. Management believes that this measure is meaningful to investors because management reviews the operating results of the Company excluding the impacts of Special items. There can be no assurances that additional Special items will not occur in future periods. To compensate for this limitation, management believes that it is appropriate to consider both the Effective tax rate determined under GAAP as well as the Operational tax rate.

(1) Special items for the year ended December 31, 2020 include Restructuring and other charges $182, debt tender fees and related costs $65, costs including interest associated with the Arconi Inc. Separation Transaction $14, costs associated with closures, shutdowns, and other items $3, and $3 costs related to fires at two plants, net of reimbursement, partially offset by ($12) reimbursement related to legal and advisory charges related to Grenfell tower.

(2) Tax Special items includes discrete tax items, the tax impact on Special items based on the applicable statutory rates, the difference between such rates and the Company's consolidated estimated annual effective tax rate and other tax related items. Discrete tax items for the period included the following:

- for the year ended December 31, 2020, a discrete tax benefit of ($64) related to the release of a reserve as a result of a favorable Spanish tax case decision, a ($30) benefit related to the recognition of a previously uncertain U.S. tax position, a ($30) benefit for a U.S. tax law change, and a net ($3) benefit for a number of small items, offset by an $8 charge resulting from the remeasurement of deferred tax balances in various jurisdictions as a result of the Arconic Inc. Separation Transaction, and a $4 charge related to tax rates in various jurisdictions. The U.S. tax law change resulted from final regulations issued in July 2020 that provided an election to exclude from global intangible low-taxed income any foreign earnings subject to a local country tax rate of at least 90% of the U.S. tax rate.

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Reconciliation of 2020 Adjusted Free Cash Flow including Pre-Separation Allocations as a Percentage of Adjusted Income from Continuing Operations (Adjusted Free Cash Flow Conversion)

($ in millions)	FY 2020
Cash provided from operations	$9
Cash receipts from sold receivables	422
Capital expenditures	(267)
Adjusted free cash flow	164
Costs associated with the Arconic Inc. Separation Transaction	77
Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction and including pre-separation allocations	$241
Allocation adjustments[1]	(146)
Adjusted free cash flow pro forma for Separation	$387
Income from continuing operations	$211
Special items:	
Restructuring and other charges	182
Discrete tax items[2]	(115)
Other special items:	
Debt tender fees and related costs	65
Costs, including interest, associated with the Arconic Inc. Separation Transaction	14
Plant fire costs, net	3
Release of tax indemnification receivable	53
Legal and other advisory reimbursements related to Grenfell Tower, net	(12)
Costs associated with closures, shutdowns, and other items	3
Reversal of state investment tax credits	9
Total Other special items	$135
Tax impact[3]	(59)
Income from continuing operations, excluding Special items	$354
Allocation adjustments[1]	(13)
Income from continuing operations excluding Special items and Allocation adjustments	$341
Adjusted free cash flow and allocation adjustments for the separation as a percentage of adjusted income from continuing operations	114%

Adjusted free cash flow; Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction and including pre-separation allocations are non-GAAP financial measures; and Adjusted free cash flow pro forma for separation. I believes that these measures are meaningful to investors because management reviews cash flows generated from operations after taking into consideration capital expenditures (due to the fact that these expenditures are considered necessary to mair expand the Company's asset base and are expected to generate future cash flows from operations), cash receipts from net sales of beneficial interest in sold receivables, as well as costs associated with the Arconic Inc. Separation Transaction. In additio management believes that Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction and including pre-separation allocations is meaningful to investors as it reflects how management reviewed cash flows of Howm quarter ended March 31, 2020 as if the Arconic Inc. Separation Transaction had happened on January 1, 2020. It is important to note that Adjusted free cash flow; Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Tra Adjusted free cash flow, excluding costs associated with the Arconic Inc. Separation Transaction and including pre-separation allocations; and Adjusted free cash flow pro forma for separation measures do not represent the residual cash flow available f discretionary expenditures since other non-discretionary expenditures, such as mandatory debt service requirements, are not deducted from the measure.

Income from continuing operations excluding Special items and Income from continuing operations excluding Special items and Allocation adjustments are non-GAAP financial measures. Management believes that these measures are meaningful to inve because management reviews the operating results of the Company excluding the impacts of Restructuring and other charges, Discrete tax items, and Other special items (collectively, "Special items"). In addition, management believes that Income from operations excluding Special items and Allocation adjustments is meaningful to investors as it reflects how management reviewed the standalone costs of Howmet in the quarter ended March 31, 2020 as if the Arconic Inc. Separation Transaction had h January 1, 2020. There can be no assurances that additional special items will not occur in future periods. To compensate for this limitation, management believes that it is appropriate to consider both Income (loss) from continuing operations determine GAAP as well as Income (loss) from continuing operations excluding Special items.

(1) Adjustments include differences between allocations as required under discontinued operations as part of general accepted accounting principles and estimated actual spending in selling, general, administrative, and other expenses and miscellaneous non-operating income related to pension, other post retirement benefits, and foreign exchange related to Howmet on a standalone basis as if the Arconic Inc. Separation Transaction had occurred on January 1, 2020.

(2) Discrete tax items for the year ended December 31, 2020 included a benefit related to the release of a reserve as a result of a favorable Spanish tax case decision ($64), a benefit related to the recognition of a previously uncertain U.S. tax position ($30), a benefit for a U.S. tax law change ($30), and a net benefit for a number of small tax items ($3), partially offset by charges resulting from the remeasurement of deferred tax balances in various jurisdictions as a result of the Arconic Inc. Separation Transactions $8, and a charge related to tax rate changes in various jurisdictions $4.

(3) The tax impact on Special items is based on the applicable statutory rates whereby the difference between such rates and the Company's consolidated estimated annual effective tax rate is itself a special item.

Reconciliation of 2021 Adjusted Free Cash Flow as a Percentage of Income from Continuing Operations (Adjusted Free Cash Flow Conversion)

($ in millions)	FY 2021
Cash provided from operations	$449
Cash receipts from sold receivables	267
Capital expenditures	(199)
Adjusted free cash flow (a)	$517
Income from continuing operations	$258
Special items:	
Restructuring and other charges	$90
Discrete tax items[1]	$9
Other special items:	
Debt tender fees and related costs	147
Plant fire reimbursements, net	(3)
Legal and other advisory reimbursements related to Grenfell Tower, net	(4)
Costs associated with closures, shutdowns, and other items	35
Total Other special items	$175
Tax impact[2]	$(90)
Income from continuing operations excluding Special items (b)	$442
Adjusted free cash flow as a percentage of Income from continuing operations (a)/(b)	117%

Adjusted free cash flow is a non-GAAP financial measure. Management believes that this measures is meaningful to investors because management reviews cash flows generated from operations after taking into consideration capital expenditures (due to the fact that these expenditures are considered necessary to maintain and expand the Company's asset base and are expected to generate future cash flows from operations), as well as cash receipts from net sales of beneficial interest in sold receivables. It is important to note that Adjusted free cash flow does not represent the residual cash flow available for discretionary expenditures since other non-discretionary expenditures, such as mandatory debt service requirements, are not deducted from the measure.

Income from continuing operations excluding Special items is a non-GAAP financial measure. Management believes that this measure is meaningful to investors because management reviews the operating results of the Company excluding the impacts of Restructuring and other charges, Discrete tax items, and Other special items (collectively, "Special items"). There can be no assurances that additional special items will not occur in future periods. To compensate for this limitation, management believes that it is appropriate to consider both Income from continuing operations determined under GAAP as well as Income from continuing operations excluding Special items.

(1) Discrete tax items for the year ended December 31, 2021 included a net benefit related to prior year amended returns and audit settlements ($14), a charge related to prior year foreign earnings distributed or no longer considered permanently reinvested $13, a net charge related to valuation allowance adjustments $9, and a net charge for other items $1.

(2) The tax impact on Special items is based on the applicable statutory rates whereby the difference between such rates and the Company's consolidated estimated annual effective tax rate is itself a Special item.

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Calculation of Segment Adjusted EBITDA Margin

($ in millions)	FY 2019	FY 2020	FY 2021	Q1 2022
Engine Products				
Third-party sales	$ 3,320	$ 2,406	$ 2,282	$ 631
Segment Adjusted EBITDA	$ 752	$ 540	$ 564	$ 173
Segment Adjusted EBITDA Margin	22.7 %	22.4 %	24.7 %	27.4 %
Fastening Systems				
Third-party sales	$ 1,561	$ 1,245	$ 1,044	$ 264
Segment Adjusted EBITDA	$ 444	$ 295	$ 239	$ 56
Segment Adjusted EBITDA Margin	28.4 %	23.7 %	22.9 %	21.2 %
Engineered Structures				
Third-party sales	$ 1,255	$ 927	$ 725	$ 182
Segment Adjusted EBITDA	$ 178	$ 125	$ 103	$ 23
Segment Adjusted EBITDA Margin	14.2 %	13.5 %	14.2 %	12.6 %
Forged Wheels				
Third-party sales	$ 969	$ 679	$ 921	$ 247
Segment Adjusted EBITDA	$ 285	$ 192	$ 294	$ 67
Segment Adjusted EBITDA Margin	29.4 %	28.3 %	31.9 %	27.1 %

Calculation of Total Segment Adjusted EBITDA and Margin

($ in millions)	FY 2019	FY 2020	FY 2021	Q1 2022
Third-party sales – Engine Products	$3,320	$2,406	$2,282	$631
Third-party sales – Fastening Systems	$1,255	$1,245	$1,044	$264
Third-party sales – Engineered Structures	$1,561	$927	$725	$182
Third-party sales – Forged Wheels	$969	$679	$921	$247
Total Segment third-party sales	$7,105	$5,257	$4,972	$1,324
Total Segment Adjusted EBITDA[1]	$1,659	$1,152	$1,200	$319
Total Segment Adjusted EBITDA margin	23.3%	21.9%	24.1%	24.1%

Total Segment Adjusted EBITDA and Total Segment Adjusted EBITDA margin are non-GAAP financial measures. Management believes that these measures are meaningful to investors because Total Segment Adjusted EBITDA and Total Segment Adjusted EBITDA margin provide additional information with respect to the operating performance and the Company's ability to meet its financial obligations. The Total Segment Adjusted EBITDA presented may not be comparable to similarly titled measures of other companies. Howmet's definition of Total Segment Adjusted EBITDA (Earnings before interest, taxes, depreciation, and amortization) is net margin plus an add-back for depreciation and amortization. Net margin is equivalent to Sales minus the following items: Cost of goods sold; Selling, general administrative, and other expenses; Research and development expenses; and Provision for depreciation and amortization. Special items, including Restructuring and other charges, are also excluded from net margin and Segment Adjusted EBITDA. Differences between the total segment and consolidated totals are in Corporate.

On April 1, 2020, Arconic Inc. completed the separation of its businesses into two independent, publicly-traded companies: Howmet Aerospace Inc. (the new name for Arconic Inc.) and Arconic Corporation. The historical results of the businesses that comprise Arconic Corporation are presented as discontinued operations in Howmet Aerospace's consolidated financial statements.

Differences between the total segment and consolidated totals are in Corporate.

[1] See Reconciliation of Total Segment Adjusted EBITDA to Consolidated Income (Loss) Before Income Taxes.

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Reconciliation of Total Segment to Consolidated Totals

Reconciliation of Total Segment Adjusted EBITDA to Consolidated Income Before Income Taxes

($ in millions)	FY 2019	FY 2020	FY 2021	Q1 2022
Income before income taxes	$210	$171	$324	**$171**
Loss on debt redemption	—	64	146	—
Interest expense	338	317	259	**58**
Other expense, net	31	74	19	**1**
Operating income	$579	$626	$748	**$230**
Segment provision for depreciation and amortization	269	262	261	**65**
Unallocated amounts:				
Restructuring and other charges	582	182	90	**2**
Corporate expense[1]	229	82	101	**22**
Total Segment Adjusted EBITDA	$1,659	$1,152	$1,200	**$319**

Total Segment Adjusted EBITDA is a non-GAAP financial measure. Management believes that this measure is meaningful to investors because Total Segment Adjusted EBITDA provides additiona information with respect to the operating performance and the Company's ability to meet its financial obligations. The Total Segment Adjusted EBITDA presented may not be comparable to simila measures of other companies. Howmet's definition of Total Segment Adjusted EBITDA (Earnings before interest, taxes, depreciation, and amortization) is net margin plus an add-back for depreciat amortization. Net margin is equivalent to Sales minus the following items: Cost of goods sold; Selling, general administrative, and other expenses; Research and development expenses; and Provisi depreciation and amortization. Special items, including Restructuring and other charges, are also excluded from net margin and Segment Adjusted EBITDA. Differences between the total segment consolidated totals are in Corporate.

(1) For the year ended December 31, 2019, Corporate expense included $10 of impairment of assets of the energy business, $9 of costs related to fires at two plants, $8 of costs related to legal a advisory charges, $6 of strategy and portfolio review costs, and $5 of costs associated with the Arconic Inc. Separation Transaction. For the year ended December 31, 2020, Corporate expens included ($12) of reimbursement related to legal and advisory charges, $7 of costs associated with the Arconic Inc. Separation Transaction, $3 of costs related to fires at two plants, net of reimbursement, and $3 of costs associated with closures, shutdowns, and other items. For the year ended December 31, 2021, Corporate expense included $35 of costs associated with closur shutdowns, and other items, ($4) of reimbursement related to legal and advisory charges, and ($3) of net reimbursement related to fires at two plants. For the quarter ended March 31, 2022, Corporate expense included $5 of costs related to fires at two plants and ($3) of reimbursement related to legal and advisory charges.


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