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## High-Level Exploration of Tariffs

How They Affect the Manufacturing Industry in  
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[ see page 2 ]

## MES Implementation Strategies for Cost Savings and Improved Reporting

[ see page 12 ]



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# C o n t e n t s

APRIL 2025 / MAY | ISSUE 307

## INDUSTRY INSIGHTS

- 02** High-Level Exploration of Tariffs and How They Affect the Manufacturing Industry in New England (and Abroad)
- 12** MES Implementation Strategies for Cost Savings and Improved Reporting

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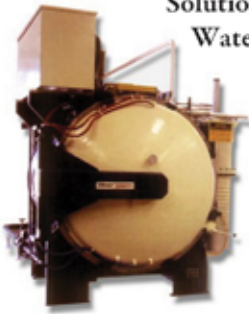
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ISSUE 307

1



## HIGH-LEVEL EXPLORATION OF TARIFFS AND HOW THEY AFFECT THE MANUFACTURING INDUSTRY IN NEW ENGLAND (AND ABROAD)

**The impact of tariffs on the manufacturing industry, particularly in a region like New England, is a complex issue with far-reaching economic consequences. Here's a breakdown of the potential effects and the current landscape.**

### *Understanding the Dynamics*

#### **Supply Chain Disruption:**

- Tariffs often disrupt established supply chains. Many New England manufacturers rely on imported raw materials, components, or machinery. Increased costs from tariffs force businesses to either absorb the expenses, pass them onto consumers, or seek alternative suppliers.
- This disruption can lead to production delays, increased lead times, and uncertainty, making it difficult for manufacturers to plan and operate efficiently.

#### **Increased Costs:**

- Tariffs directly increase the cost of imported goods. This can lead to higher production costs for manufacturers, potentially reducing their competitiveness in both domestic and international markets.

- These increased costs can trickle down to consumers, resulting in higher prices for finished goods.

#### **Retaliatory Measures:**

- When one country imposes tariffs, other countries often retaliate with their own tariffs. This can create a trade war, harming manufacturers that rely on exports.
- New England businesses that export their products could face significant challenges if other countries impose retaliatory tariffs.

#### **Reshoring and Domestic Production:**

- One potential positive outcome of tariffs is that they could incentivize manufacturers to bring production back to the United States. This “reshoring” could create jobs and boost domestic manufacturing.
- However, reshoring requires significant investment in infrastructure, equipment, and labor, and it may not be feasible for all industries.

**Impact on New England's Specific Industries:**

- New England's manufacturing sector is diverse, with strengths in areas like aerospace, defense, medical devices, and specialized manufacturing. Each of these sectors face unique challenges related to tariffs.
- For example, the aerospace and defense industry relies on specialized materials, some of which are imported. Tariffs on these materials could increase production costs and affect competitiveness.
- The medical device industry, known for its high-tech production, could be impacted by tariffs on electronic components and specialized materials.

## Current Industrial Marketplace Observations

**Increased Uncertainty:**

- The ever changing global political landscape, creates uncertainty for manufactures. This makes it difficult for businesses to make long-term investments and strategic decisions.

**Supply Chain Diversification:**

- Many manufacturers are actively diversifying their supply chains to reduce their reliance on any single country or region. This involves exploring alternative suppliers, nearshoring production, and investing in domestic sourcing.

**Automation and Technology:**

- To mitigate the impact of rising costs and labor shortages, manufacturers are increasingly investing in automation and advanced technologies. This includes robotics, artificial intelligence, and digital manufacturing.

**Labor Market Challenges:**

- The manufacturing industry continues to face labor shortages, particularly for skilled workers. Tariffs could exacerbate this issue by making it more difficult for manufacturers to compete for talent.

**The small business impact:**

- Small to medium sized manufacturing businesses are affected much more heavily by tariffs. They do not have the same flexibility as large corporations to move production, or to absorb large cost increases.

**New England's Position**

- New England's economy, while diversified, is still reliant on manufacturing. The region's high-tech manufacturing sector is particularly vulnerable to disruptions in global supply chains.
- The region's high cost of living and labor market challenges could make it more difficult for manufacturers to absorb the increased costs associated with tariffs.
- New England does have a history of innovation, and this could help the region to adapt to the changing global market.

Tariffs pose a significant challenge to the manufacturing industry, particularly in New England. While they could incentivize reshoring and boost domestic production, they also carry the risk of supply chain disruptions, increased costs, and retaliatory measures. The ability of New England's manufacturers to adapt to these challenges will depend on their ability to diversify supply chains, invest in technology, and address labor market challenges.

## Deep Dive into Tariff Impacts:

**The Ripple Effect on Local Economies**

The imposition of tariffs extends beyond the immediate impact on manufacturing, triggering a ripple effect throughout local economies. Supporting industries, such as transportation, logistics, and warehousing, experience consequential shifts as manufacturing activity fluctuates. Furthermore, small businesses, vital components of the local economic ecosystem, face potential declines in demand as their manufacturing clients grapple with increased costs and production slowdowns. The magnitude of this impact varies significantly, depending on the specific industries prevalent within a region and their degree of reliance on international trade.



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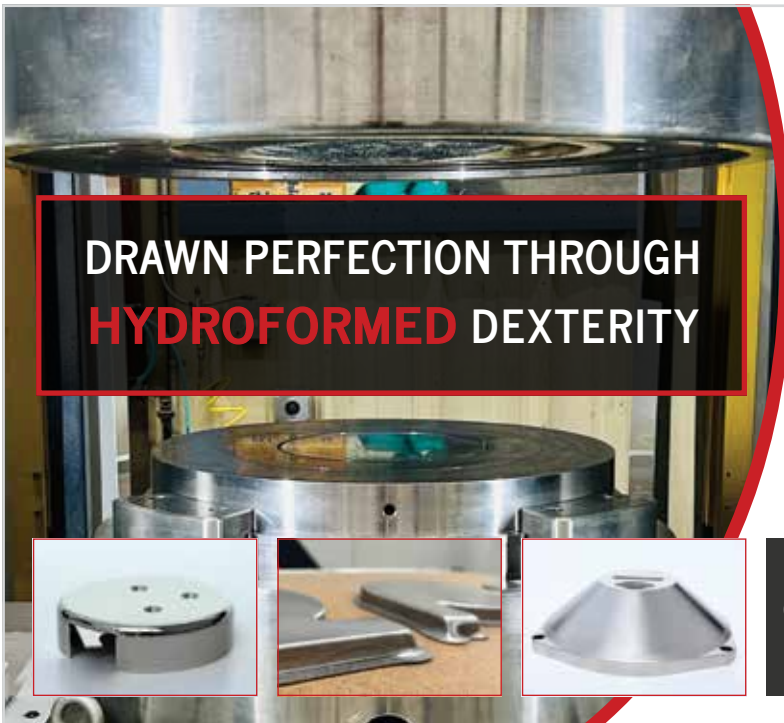
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### **Innovation and Adaptation**

Tariffs, while undeniably creating obstacles, can also act as a catalyst for innovation. Manufacturers, facing increased costs, are compelled to explore new avenues for efficiency, cost reduction, and alternative sourcing. This drive can lead to significant investments in research and development, the adoption of cutting-edge technologies, and the creation of novel business models. For a region like New England, with its rich history of technological innovation, this presents a unique dual challenge and opportunity. The region's capacity to adapt and innovate will be paramount in maintaining its long-term competitiveness in the face of these economic pressures.

### **The Long-Term Impact on Competitiveness**

The long-term effects of tariffs on the competitiveness of New England's manufacturing sector remain ambiguous. If tariffs persist, they could gradually diminish the region's competitive edge in specific industries. Conversely, tariffs might spur increased domestic production and investment in advanced manufacturing technologies, potentially bolstering the region's long-term competitiveness. However, the global marketplace is fiercely competitive, and any additional costs imposed by tariffs could significantly impede a company's ability to compete with foreign markets.

### **Geopolitical Considerations**

Tariffs are frequently employed as a tool within geopolitical strategies, and their resulting impact is invariably shaped by broader political and economic forces. Fluctuations in trade relationships, political instability, and shifting global economic trends all contribute to the varied effects of tariffs on New England's manufacturing sector. For instance, the imposition of tariffs on goods from China, followed by an improvement in diplomatic relations, could lead to their removal and a subsequent reduction in the cost of goods. This constant state of flux generates an atmosphere of economic instability, making long-term planning difficult.

### **The Consumer's Perspective**

Tariffs are often strategically employed as geopolitical tools, and their effects are invariably influenced by broader political and economic factors. Changes in trade relationships, political instability, and global economic trends all play a role in shaping the impact of tariffs on New England's manufacturers. For instance, if the U.S. imposes tariffs on goods from China and then relations improve, these tariffs may be removed, leading to a decrease in the cost of goods. This constant fluctuation creates an atmosphere of instability, making long-term planning challenging for businesses.



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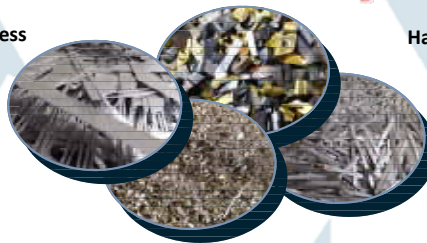
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### The Role of Government Policy

Government policies are instrumental in cushioning the adverse effects of tariffs and providing essential support to the manufacturing industry. Such policies can encompass direct financial assistance to manufacturers, strategic investments in infrastructure and workforce development, and the negotiation of trade agreements that minimize trade barriers. Furthermore, governments may implement tax breaks or offer incentives designed to retain manufacturing jobs within a specific region, thereby bolstering local economies and mitigating the potential negative impacts of tariffs.

### The Importance of Skilled Labor

The modern manufacturing sector's heavy reliance on skilled labor makes the current shortage of qualified workers a critical challenge. Tariffs can further complicate this issue by intensifying competition for talent, as manufacturers grapple with increased costs. Therefore, strategic investments in training and education programs are essential to cultivate a robust and skilled workforce in New England, capable of supporting the region's manufacturing industry.

### The Rise of Regional Manufacturing

The increasing complexity and vulnerability of global supply chains are driving a shift towards regional manufacturing. This approach focuses on producing goods closer to their point of consumption, resulting in reduced transportation costs and shorter lead times. New England, with its strategic location near major markets and its well-established manufacturing foundation, is well-positioned to capitalize on this growing trend.

### The Digital Transformation of Manufacturing

The manufacturing industry is currently experiencing a significant digital transformation, characterized by the integration of technologies like artificial intelligence, the internet of things, and 3D printing. These advancements offer the potential to enhance efficiency, reduce operational costs, and facilitate the production of highly customized goods. New England's robust technology sector positions the region's manufacturers favorably to adopt these innovations and maintain a competitive edge in the evolving global marketplace.

### Sustainability and Resiliency

Modern manufacturing is increasingly prioritizing sustainability and resiliency, compelling manufacturers to actively seek methods to minimize their environmental footprint and develop more robust supply chains. New England's dedication to sustainability, coupled with its strong network of research institutions, positions the region favorably to emerge as a leader in sustainable manufacturing practices.

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*The effects of tariffs on New England's manufacturing are multifaceted and create both challenges and opportunities. The region's ability to adapt, innovate, and leverage its strengths will determine its long-term success in the global marketplace.*

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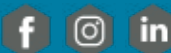
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## MES IMPLEMENTATION STRATEGIES FOR COST SAVINGS AND IMPROVED REPORTING

*This feature was submitted by our colleague, Louis Columbus, Senior Marketing Manager at DELMIA.*

MES systems enhance operational efficiency, provide substantial cost savings, ensure quality control, help with regulatory compliance and traceability, and improve decision-making processes.

Implementing a Manufacturing Execution System (MES) can be a game-changer for your organization. Imagine having real-time access to production data, enabling swift decision-making and corrective actions, which boosts your operational efficiency, reduces costs, and enhances reporting accuracy. However, while the benefits are significant, introducing this technology comes with its own set of challenges. Let's dive into some strategic approaches to maximize the advantages while tackling potential obstacles head-on.

### **Key Benefits of MES Implementation**

Understanding the key benefits of MES is crucial to fully grasp its transformative potential. MES systems enhance operational efficiency, provide substantial cost savings, ensure quality control, help with regulatory compliance and traceability, and improve decision-making processes. Exploring these benefits in more detail can shed light on why MES implementation is a worthy investment.

### **Enhanced Operational Efficiency**

The first and perhaps most impactful benefit of MES implementation is enhanced operational efficiency. MES systems provide real-time data access and analysis, improve production planning, and optimize resource utilization. This section delves into how these capabilities translate into tangible improvements in production efficiency.

**Real-Time Data Access and Analysis:** MES systems offer up-to-the-minute access to production data, allowing you to make quick decisions and take immediate corrective actions. According to the Manufacturing Institute, real-time data access can boost production efficiency by up to 20%.

**Improved Production Planning:** Accurate scheduling reduces lead times and boosts on-time delivery rates, making your supply chain more reliable. For instance, General Electric reduced their lead times by 15% after implementing MES, as reported by McKinsey & Company.

**Resource Optimization:** By streamlining resource utilization, MES helps minimize waste and improve energy efficiency. Research from Energy Star shows that companies can save up to 10% on energy costs through optimized resource management.

**Cost Savings:** Beyond operational efficiency, MES can lead to significant cost savings. These savings come from optimized resource utilization, waste reduction, and improved energy efficiency. This section examines how MES implementation can directly impact your bottom line through cost-effective operations.

**Optimized Resource Utilization:** Efficient use of materials, labor, and machinery lowers operational costs. Deloitte reports that companies can achieve cost reductions of up to 30% with effective MES deployment, as found in the Manufacturing Report.

**Waste Reduction:** Real-time monitoring allows for immediate identification and correction of inefficiencies, reducing scrap and rework. Aberdeen Group found that manufacturers reduced waste by 25% using MES solutions, according to the Manufacturing Report.

**Energy Efficiency:** Automated systems adjust energy use based on current demand, leading to lower utility bills. For example, Siemens reported a 12% decrease in energy consumption at their manufacturing plants after implementing MES, as detailed in the Manufacturing Report.

**Quality Control:** Maintaining high-quality standards is essential for any manufacturing process. MES systems ensure real-time monitoring and automated alerts, which help maintain product quality and reduce defect rates. This section explores how MES can enhance quality control throughout the production process.

**Real-Time Monitoring:** Continuous oversight ensures that quality standards are maintained throughout the production process. McKinsey & Company found that real-time quality monitoring can reduce defect rates by 40%.

**Automated Alerts:** Instant notifications help identify defects early, allowing for prompt corrective measures and reducing the risk of widespread quality issues. A case study from Toyota demonstrated a 50% reduction in quality-related downtime with MES, reported by McKinsey & Company.

## **Regulatory Compliance and**

**Traceability:** Compliance with industry regulations and maintaining traceability are critical to avoiding penalties and ensuring accountability. MES systems enhance compliance and provide detailed tracking of production stages. This section discusses how MES can support regulatory compliance and improve traceability.

**Enhanced Compliance:** MES ensures that processes adhere to company and corporate standards and regulatory requirements, reducing the risk of non-compliance penalties. PwC reports that compliance rates can increase by 20% with MES, as stated in the Manufacturing Report.

**Improved Decision-Making:** MES systems provide actionable insights through comprehensive data analysis. These insights facilitate informed decision-making, leading to better overall performance and strategic planning. This section examines how MES can enhance decision-making processes within your organization.

**Actionable Insights:** MES provides comprehensive data analysis, offering deeper insights into production metrics, which support informed decision-making. IBM found that decision-making speed improved by 25% with MES analytics, as reported by McKinsey & Company.

## **Implementation Challenges and**

**Strategies:** Despite the numerous benefits, MES implementation comes with its own set of challenges. Understanding these challenges and developing strategic approaches to address them is essential for successful MES integration. This section outlines common challenges and provides strategies to overcome them.

**Resistance to Change:** Resistance to change is a significant hurdle in MES implementation. This section explores strategies for engaging stakeholders, communicating benefits, and managing change effectively to overcome resistance.

**Change Management Programs:** Implement structured programs to manage the transition



and address concerns. Prosci research shows that organizations with effective change management are six times more likely to meet or exceed project objectives, as highlighted in the Manufacturing Report.

**Integration with Existing Systems:** Ensuring that MES integrates seamlessly with existing systems is crucial. This section discusses how to conduct compatibility assessments, opt for gradual integration, and secure vendor support for a smooth transition.

**Compatibility Assessment:** Conduct a thorough evaluation of current ERP systems and operational technologies to ensure that MES can seamlessly integrate with existing IT infrastructure.

**Vendor Support:** Work closely with MES providers to ensure seamless integration and choose vendors with a proven track record in your industry.

**Data Security Concerns:** Data security is a critical concern in MES implementation. This section outlines

strategies for implementing robust security protocols, conducting regular audits, and ensuring compliance with data protection regulations.

**Regular Audits:** Conduct routine security assessments to identify and address vulnerabilities. Use third-party auditors for an unbiased evaluation.

**Initial Investment Costs:** The initial investment required for MES implementation can be significant. This section provides strategies for conducting a cost-benefit analysis, opting for phased implementation, and securing financial planning to manage these costs effectively.

**Cost-Benefit Analysis:** Evaluate the long-term savings and ROI to justify the initial outlay. Highlight tangible and intangible benefits in your analysis.

**Financial Planning:** Secure funding and budget allocations well in advance. Consider leveraging financial incentives or grants available for technology upgrades.



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**Need for Skilled Personnel:** Having skilled personnel is crucial for the successful implementation and maintenance of an MES. This section discusses strategies for developing training programs, hiring experts, and encouraging continuous learning.

**Training and Adoption:** Effective training and adoption strategies are critical for MES's success. This section outlines how to choose a user-friendly interface, provide hands-on training, and establish support systems to facilitate smooth adoption and usage.

**User-Friendly Interface:** Starting with conversations and interviews with those who will use the system the most often, agree on a common definition of what user friendly is in your organization, and what it looks like for

the long term. Choose an MES with an intuitive interface to facilitate easier adoption. User-friendly systems reduce training time and improve user satisfaction.

**Support Systems:** Set up a dedicated support team to assist with any issues that arise during the initial stages of implementation. Ensure that support is available 24/7 to address critical issues promptly.

How long does it take to implement a MES system?

The typical MES deployment timeline ranges from 8 to 16 months, depending on your production facilities' complexity and scope. Manufacturing companies with multiple shop floor locations might require longer periods to ensure proper integration across all sites.

A successful rollout begins with a thorough gap analysis lasting 4-6 weeks. The project manager then dedicates 2-3 months to system configuration and customization based on specific industry requirements.

The actual deployment phase takes 3-4 months, including comprehensive testing and data migration. Many organizations choose a phased approach, starting with a pilot program in one area before expanding. This method helps identify potential issues early while maintaining regular production schedules.

Integrating a Manufacturing Execution System (MES) deployment into your organization can significantly enhance operational efficiency, cost savings, and reporting accuracy. By strategically addressing potential challenges and leveraging the vast benefits of MES, your business can stay ahead of the competition and continuously innovate.

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### Creating the Ideal Environment for Precision and Performance

Hermitage PA, April 23, 2025 – Solar Atmospheres of Western PA has taken a proactive step toward enhancing operational reliability and workplace comfort by constructing a new temperature-controlled environment around their critical Haas machining centers and Marvel saws. This strategic investment was driven by the upcoming commissioning of a large water quenching furnace, scheduled to be installed near the tensile machining area by year's end.

Keith King, Testing Manager, explains: “The electronics of the machining centers were struggling in the summer months when it got hot in the shop. The warning lights would hit the yellow zone—and problems were inevitable. Our new environmentally controlled space will be ideal not only for the machines but also for the operator!”

The new climate-controlled room will ensure optimal conditions for both precision equipment and personnel, reducing the risk of heat-related malfunctions and improving overall productivity and safety.

This is just another example of Solar Atmospheres' commitment to operational excellence and continuous improvement.

*For additional information about Solar Atmospheres, contact Mike Johnson at 855-934-3284 x2223, email at [mikej@solaratm.com](mailto:mikej@solaratm.com), and visit us at [solaratm.com](http://solaratm.com).*



### PI Expands U.S. Manufacturing of Motion Control Solutions to Address Trade Challenges and Strengthen Customer Support

SHREWSBURY, Mass., April 23, 2025 /PRNewswire/ -- PI (Physik Instrumente), a global leader in precision motion control and nanopositioning systems, is pleased to announce progress in the construction of its new production facility in Shrewsbury, Massachusetts. This strategic expansion underscores PI's commitment to mitigating import tariffs and aligning production and support services closer to its U.S. customer base.

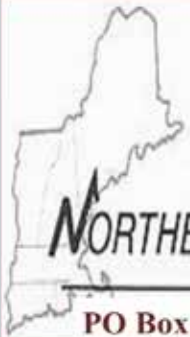
The forthcoming 140,000-square-foot facility will triple the combined space of PI's current New England locations in Auburn, MA, Hopkinton, MA, and Nashua, NH. Scheduled to commence operations in Fall 2025 — just 1.5 years after groundbreaking in early 2024 — the Shrewsbury plant will manufacture precision motion and automation systems, air bearings, piezoelectric transducers, and nanopositioning components. This initiative aims to enhance PI's responsiveness to market demands and reduce lead times for American clients.

PI's new Massachusetts engineering and manufacturing facility is also set to create high-quality engineering and technology jobs, bolstering the region's advanced manufacturing sector. This expansion will attract top talent and stimulate economic growth in the greater Boston, MA area.

By localizing production, PI aims to insulate its operations from the volatility of international trade policies and import tariffs, ensuring stable pricing and supply for its customers. This move also aligns with broader industry trends where companies are seeking to mitigate tariff impacts by reshoring manufacturing operations.



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The Shrewsbury facility represents a significant investment in PI's global growth strategy, emphasizing the importance of the North American market.

Beyond manufacturing, the site will serve as a hub for innovation, fostering the development of cutting-edge technologies and products tailored to the evolving needs of industries such as photonics, semiconductors, aerospace, and life sciences.

*See a variety of photonics, laser technology, and nanopositioning applications covered by PI system technologies links on our website.*



### Thermo Fisher commits \$2B to US manufacturing

*The company said the investment will create high-paying jobs and add lab services capacity to its domestic healthcare supply chain.*

Thermo Fisher Scientific's headquarters in Waltham, Massachusetts. The company plans to invest \$2 billion over the next four years in U.S. manufacturing and research and development.

Amid geopolitical and market pressures, manufacturers are evaluating their supply chains, with some doubling down on U.S. investments to avoid higher taxes. Earlier this week, Roche committed \$50 billion to new and

existing drug production facilities. Meanwhile, other companies are conducting layoffs or canceling projects as the administration's policies take hold.

"Thermo Fisher is proud to serve as a growth engine for the American economy," Marc Casper, chairman, president and CEO of Thermo Fisher, said in a statement. "By expanding our U.S. operations, we ensure that life-saving medicines and therapies will continue to be developed and produced in America for decades to come."

Thermo Fisher has 64 U.S. facilities across 37 states that make medical equipment and enable biopharma companies to develop and produce their medicines, according to a news release. The Waltham, Massachusetts-based company has more than doubled in size to \$43 billion in revenue over the past eight years.

Thermo Fisher's \$2 billion investment is targeted in part at expanding its biopharma services, Casper said in an earnings call Wednesday.

"We just believe there's going to be more activity here, whether there's tariffs or not," he said.

Thermo Fisher is also moving forward with plans to acquire Solventum's purification and filtration business for \$4.1 billion. The transaction is expected to close by the end of 2025.



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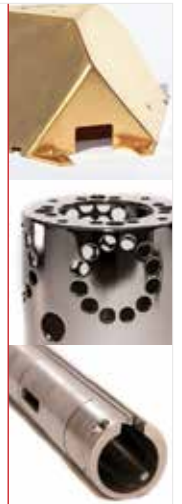
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