

Metco Industries: Balancing PM innovation, investment discipline and next-generation pressing technology

In Pennsylvania's St. Marys region, one of the world's leading centres of Powder Metallurgy, Metco Industries has established itself as a steady, technically driven manufacturer serving automotive and industrial markets. Founded in 1982, the company has grown through disciplined investment in advanced technology, including a new state-of-the-art 500-ton CNC electric press that enhances precision and efficiency. Visiting the company, Bernard North reports on how Metco's focus on innovation, process capability, and long-term resilience continues to define its success in a competitive PM industry.

St Marys and its neighbouring towns in west-central Pennsylvania – Brockway, Ridgway, DuBois and Emporium, to name a few, in Elk and neighbouring counties – are home to one of the biggest concentrations of press and sinter Powder Metallurgy production in the world. The area boasts numerous companies active in the field, along with their suppliers and service providers, all of which make or work with powder, dies, presses, and furnaces, as well as providing automated materials handling, machining parts, laboratory services, quality assurance methods, and other essential capabilities required for the industry.

PM parts manufacturers represent a range of business models and ownership structures, including privately held firms, public companies, divisions of large public companies, and those backed by private equity. Some have diversified technically into Metal Injection Moulding and/or Additive Manufacturing, while others remain

wholly focused on pressing as their powder forming method. Together, the PM industry in the area forms a fascinating and critically important sector that provides thousands of manufacturing and technical jobs in a largely rural area, producing a wide range of high-quality metal parts necessary for the functioning of many industries and their products.

It was on a bright October morning that the author travelled through the Pennsylvania countryside and small towns to visit one of the larger privately held PM parts manufacturers in the region: Metco Industries, Inc. The visit aimed to learn about its history, processes, products, and business philosophy.



Fig. 1 Metco Industries' manufacturing facility on Bruxelles Street in St. Marys, Pennsylvania, one of the world's largest centres for press and sinter Powder Metallurgy production (Courtesy Metco)



Fig. 2 Powder containers positioned above Gasbarre presses (750 tons on the left, 60 tons on the right) following a 180° rotation for loading into the feed hopper (Courtesy Metco)

A half-day was spent in discussion and on a plant tour with Plant Manager Matt Liptak, joined at times by Metco's President, Rodney Brennen, who provided some historical context and spoke about the company's strategic direction.

Company history

Metco Industries was founded on January 1, 1982, by three partners with a single press, furnace, and parts tumbler, operating from a garage building in St. Marys. The small business grew quickly, and in 1984 it relocated to what was then a greenfield site on Bruxelles Street, about a mile east of the town centre, where it remains to this day. The first building at the new site covered around 2,000 m² (20,000 ft²). As demand grew, the production area was expanded incrementally – in 1986, 1994 and 2000, then again in 2016 (adding 1,700 m²/17,000 ft²) and

2022 (a further 1,500 m²/15,000 ft²) – bringing the total footprint to around 16,000 m² (160,000 ft²) – roughly eight times the size of its 1984 building. Following the purchase of adjoining land, detailed plans and utility connections are already in place for a further 1,600 m² (16,000 ft²) of space anticipated within the next five years.

Key equipment milestones along the way include the first new press in 1982, the first new belt furnace in 1984, and the first 200-ton multi-action press in 2002. Staffing currently stands at about 180, with production running five days a week across three shifts.

Unlike many companies in the PM industry, Metco was largely unaffected by the COVID-19 pandemic, due to the strength of its agricultural, lawn and garden customer base. The company currently consumes approximately 4.5 million kg (~10 million lb) of powder annually – equivalent to

roughly 5,000 US short tons (4,500 metric tonnes) – to produce around 60 million PM parts per year, or about 240,000 parts per working day. Metco remains optimistic about business prospects, evidenced by a 'positions available' sign alongside the road in front of the plant, the aforementioned expansion plans, as well as anticipated capital equipment purchases.

The company is wholly based in St. Marys, operating from its facilities on Bruxelles Street with an additional local warehouse, and has no plans for geographic diversification.

Manufacturing overview

Powder

Around 90% of Metco Industries' production is based on a range of ferrous PM alloys, with the remainder split roughly equally between 400-series stainless steels

– high-carbon (C), low-nickel (Ni) ferritic or martensitic grades – on the one hand, and copper alloys (copper, brass, bronze) on the other. The larger-volume powder grades are received in containers designed to fit into the press feed hopper. Each container is flipped through 180° to place the open end downwards (Fig. 2), then lifted by forklift above the press and connected to the powder feed system leading to the feed shoe.

Around 85% of powder is processed as received, but four double cone blenders with intensifier bars, of various sizes, are used to produce bespoke mixes for R&D, particular compositions, specific pressing and sintering responses, or for quick availability of specific compositions – especially where less than 230 kg (500 lb) is required.

Dies

Metco's in-house die designers collaborate with customers on their part models, most commonly using Solid Edge or Creo software, to create detailed die designs. The company does not manufacture dies in-house but works closely with local specialist die shops. However, dies are repaired and reconditioned on site.

Currently, Metco has about 2,000 active part geometries, each with one or more dies in the plant. Most dies remain the property of the customer for the corresponding parts. When a part goes out of production, the customer may request the die's return or, more commonly, proof of its destruction. Many dies, however, simply remain in inventory. Liptak mentioned that he is starting to see more instances of customers re-shoring products, leading to the reactivation of older dies for new orders.

About 30% of dies use cemented carbide punch faces. Liptak added that he is very impressed with cobalt powder metal (CPM) steels as an economical alternative. A small percentage of dies are multi-cavity. Typical lead times for detailed die design and manufacture are three to five weeks.



Fig. 3 Metco's latest addition to its production line is an Osterwalder OPP 5000 MP 500-ton CNC electric press, featuring three upper and six lower compaction levels (Courtesy Metco)

Pressing

Metco operates forty-four presses, all of which are mechanical, except for two hydraulic and one new CNC electric model. Press capacity ranges from 30-750 tons, with most falling within the 60-200 ton range, and an even split between single- and multi-level types. The latter includes machines with up to seven levels, except for the latest 500-ton CNC electric press (Fig. 3), which has three upper and six lower levels.

Powder hoppers are enclosed to prevent contamination, and the powder flow system to the feed shoe on each press is designed to maintain a constant 'head' of powder,

improving green weight and, consequently, green density repeatability.

Most presses are 'picked' by robots, in many cases positioning the parts against rotating brushes for de-flashing before placing them on moving belts transferring the green parts to setters ready for sintering, or in some cases directly to the furnace belts. Typical setup times for die changeover are around four or five hours if a powder change is also required.

Presses are predominantly arranged in two main areas, each of which feeds a battery of sintering furnaces – sometimes directly on transfer belts, and in other cases



Fig. 4 An operator setting up the Osterwalder OPP 5000 MP 500-ton CNC electric press (Courtesy Metco)



Fig. 5 Automated robotic cell used for picking and de-flashing pressed parts prior to sintering (Courtesy Metco)

through batch handling. The furnace outputs in turn feed a shared 'tumbling' process area located between the two press and sinter zones.

Metco keeps a close watch on alternative forming processes such as Metal Injection Moulding and Additive Manufacturing, but, like many – though not all – press and sinter PM parts manufacturers, has not yet chosen to enter those areas.

Metco's latest addition to its production line is the Osterwalder OPP 5000 MP 500-ton CNC electric press. According to Liptak, the press' user-friendly control software and F.A.S.T. tool change system allow some die setup to be carried out offline while the press is still producing parts. In combination, these features deliver significantly shorter setup times during die changes.

The press is very quiet and low in energy usage. Its multiple compaction levels and highly precise tooling movements ensure more uniform green density, producing components that are closer to net shape after sintering. This capability can eliminate the need for repressing and reduce subsequent machining requirements. The press's design and motion control are also expected to minimise maintenance needs, further contributing to uptime and overall efficiency.

Delubing and sintering

Metco no longer uses separate delubing furnaces. They were used in the past, but Liptak explained that modern multi-zone furnaces with hydrogen (H_2) dew point control have made them unnecessary. Currently, the company runs fourteen belt furnaces, with belt widths ranging from ~30 cm (12") to ~61 cm (24"), and between three and seven zones. Three of these furnaces are capable of an accelerated cool-down for sinter-hardened products.

Despite stainless steels accounting for about 5% of Metco's product mix, the company oper-

ates no high temperature pusher furnaces. Liptak noted that 400 series stainless steels can be sintered using cycles suited to belt furnaces. An additional belt furnace is on order for delivery in January 2026.

Metco has operated its own nitrogen gas facility since 2008, and in 2022 upgraded its on-site hydrogen generation plant – tripling capacity to provide approximately sixty-five days of supply.

Post-processing and finishing

Several vibratory bowl tumblers, using a variety of media – including PM steel pellets produced in-house by Metco – are employed for deburring and for improving the surface finish and appearance of parts. Eight presses with a capacity of 20-200 tons are available for repressing (also known as restriking), which is done on approximately 15% of products.

After deburring and, where needed, repressing, parts are transported by forklift from the main building up a heated underground concrete ramp – as readers familiar with St. Marys' harsh winters will appreciate. They are delivered to a separate, climate-controlled 2,100 m² (21,000 ft²) facility housing Pro Process LLC, Metco's wholly owned machining, finishing, and assembly facility.

Approximately 80% of Metco's machining needs are fulfilled in-house, with the remainder handled by local specialist shops. In-house capabilities include turning, milling, drilling, tapping, honing, grinding, and laser engraving, as well as annealing and steam treatment. Other processes, such as oil impregnation and coating, are carried out by qualified subcontractors. An increasing amount of assembly work is also done at Pro Process, much of it using a high level of automated materials handling, with robots picking and placing parts between individual process and inspection steps.



Fig. 6 A Gasbarre continuous sintering furnace (Courtesy Metco)



Fig. 7 A production/inspection line in the Pro Process finishing area (Courtesy Metco)

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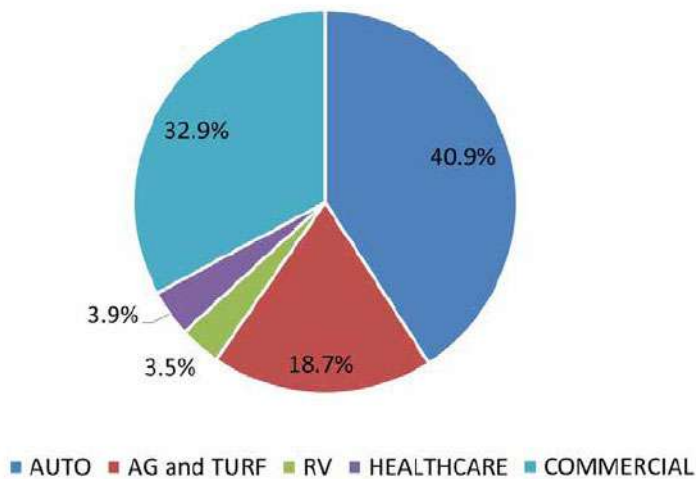


Fig. 8 2025 market segmentation by application sector, showing the dominant automotive segment (40.9%), commercial (32.9%), agriculture and turf (18.7%), healthcare (3.9%), and recreational vehicles (3.5%) (Courtesy Metco)

“Metco’s product mix is notably diverse. For 2025 to date, the sales mix comprises 41% automotive, although, unusually for a PM company, most of this is in steering and chassis components or assemblies – braking, suspension, etc. – rather than engine or transmission parts.”

Maintenance and repair

Metco has a substantial in-house repair and maintenance capability that contributes to cost control, quality improvement, and reduced lead times. Die tooling is repaired and refinished internally, with jigs, fixtures, and materials-handling equipment also produced on site.

Further, presses are routinely reconditioned at the plant, primarily those already in-house. Interestingly, at the time of the visit, an old restriking press recently purchased externally was awaiting reconditioning; Liptak

noted that, once completed, it would be incorporated into Metco’s production.

Additive Manufacturing

While Metco does not currently use metal AM to produce components, it operates five polymer-based AM machines in-house. These are used for a range of purposes, including the production of physical models of new parts and dies to support communication with customers and suppliers and the manufacture of press feed shoes and gripper fingers for parts handling.

Engineering and sales

Metco’s internal sales engineers – all of whom hold degrees and are qualified engineers – are assigned to specific customers, enabling close collaboration on technical details and the exchange of CAD models with their counterparts at customer sites. The company also employs commission-based manufacturers’ representatives on a geographic basis to support regional and international accounts.

Much of Metco’s marketing is, in effect, driven by existing customers broadening their product range and by word-of-mouth recommendations. The company also maintains visibility through exhibitions at relevant trade events, particularly within the automotive supply chain, and by hosting ‘PM 101’ training courses, held at customers’ facilities.

Metco’s engineering and tool-design teams work closely with customers to obtain final approval for production, reinforcing its commitment to quality and manufacturability from the earliest design stages. The company’s in-house and external sales networks together serve North America and overseas markets.

Products and markets

Metco’s product mix is notably diverse (Fig. 8). For 2025 to date, the sales mix comprises 41% automotive, although, unusually for a PM company, most of this is in steering and chassis components or assemblies – braking, suspension, etc. – rather than engine or transmission parts. Some 33% of production is defined as commercial – a wide variety of parts, serving multiple industries including heating, air conditioning, and refrigeration, 19% is for agricultural and turf (covering everything from large tractors and other farm equipment to small lawn and garden tools), 4% healthcare, and 3% recreational vehicles (including all-terrain vehicles and similar off-highway equipment).

Based on the location of the immediate customer shipment site, approximately 80% of sales are within North America (the US, Canada, and Mexico), with the remaining 20% distributed across Europe, Asia, and South America.

Production is approximately 90% ferrous alloys, covering a wide range of specifications, 5% 400-series stainless steels (low nickel, high carbon), and 5% copper-based alloys (copper, brass, bronze). Metco only began stainless-steel production within the past three years.

A small number of PM blanks are sourced externally if their compositions make in-house production uneconomic. Metco expects to further diversify into soft magnetic composites (SMCs, materials used in electric motors, solenoids, and similar applications) and is currently in the R&D and testing phase with such materials.

In terms of part size, Liptak explained, "Our sweet spot is parts between about ½ in (12 mm) and 2 in (50 mm) in lateral dimension, mostly produced on presses between 60 and 200 tons."

That said, Metco also manufactures both smaller and larger components. The smallest measures 2.5 x 2.3 mm (0.10 x 0.09") and weighs just 0.23 g, while the largest reaches up to 25 cm (10") in lateral dimension, 90 mm (3.5") in height, and about 3.6 kg (8 lb) in mass. Based on overall powder usage and annual output, the average part mass is around 75 g.

Liptak and Brennen noted that Metco is unusually flexible in accepting low-volume production orders, with quantities as small as twenty-five parts. The company's average order size is approximately 5,000 parts, while the largest orders can range up to around 1 million parts.

Metco averages about nine weeks from receipt of order to first delivery if a new die must be made, and about five weeks for repeat orders where tooling is already on-site. Additionally, many agricultural and turf products are kept as finished goods



Fig. 9 A large, complex steering system component manufactured on the 500-ton Osterwalder electric press (Courtesy Metco)

inventory and can be shipped upon receipt of an order. On-time delivery performance has an internal target of over 95% and is currently around 98%.

Currently, the company maintains approximately 2,000 active part numbers with corresponding tooling, and in a typical month, ships around 380 different parts – suggesting an

average of about eighteen different part numbers per working day.

Commenting on trends that he has observed, Liptak noted, "When I started at Metco, tolerances were in thousandths [of an inch], then in tenths, now they are in microns." Both part complexity and required surface finish quality have increased over time. Another notable trend,

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Fig. 10 Metco won an MPIF PM Design Excellence award this year for this throttle pedal part for off-highway construction equipment. The component is compacted conventionally to near-net shape using a hydraulic press with fill compensation and selective ejection. Secondary machining is performed to ensure a tight sliding fit of a bushing, a snap-ring retention feature, and for the tab on the face of the post. The final operation is zinc electroplating with a clear chromate conversion for corrosion protection. Previous designs used stampings and castings that were machined and assembled (Courtesy MPIF)

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clearly evident in the Pro Process section of the plant tour, is the growing provision of assemblies combining PM and, in many cases, non-PM parts. As Liptak and Brennen noted, “Customers want a one-stop shop.”

Liptak sees Soft Magnetic Composites (SMCs) as a key area of future growth, both for Metco and the wider Powder Metallurgy industry. He also believes that there is still considerable potential,

through a combination of education and process improvement, to convert more cast metal components to PM.

Metco's success in the MPIF Design Excellence Awards

Metco's expertise in Powder Metallurgy continues to earn industry recognition, with the company receiving both a Grand Prize and an

Award of Distinction in the Conventional PM Component category of the Metal Powder Industries Federation (MPIF) 2025 Design Excellence Awards.

The Grand Prize, in the Lawn & Garden/Off-Highway category, recognised a throttle pedal for off-highway construction equipment (Fig. 10). Produced to near-net-shape on a hydraulic press with fill-compensation and selective-ejection functions, the part undergoes secondary machining for precision features including a sliding bushing fit and snap-ring retention, followed by zinc electroplating with clear chromate conversion for corrosion protection. The PM design replaces a multi-piece stamped and cast assembly requiring extensive machining.

In the Automotive-Chassis category, Metco also received an Award of Distinction for a damping piston used in automotive shock absorber systems (Fig. 11). The component's manufacture involves multiple independent

press functions to achieve exacting dimensions and mass, supported by special handling equipment and secondary machining. With multi-level, high-precision PM compaction, parts are produced to near-net shape, offering a cost-effective alternative to conventional manufacturing.

Quality, safety and sustainability

Metco receives quality assurance data on powder batches from its suppliers and supplements this with in-house measurement of carbon, oxygen, particle size, and powder flow. External laboratories perform metallic elemental analyses, while metallographic specimen preparation and optical microscopy are carried out internally. When Scanning Electron Microscopy (SEM) is required, Metco collaborates with a local university. Rockwell hardness testing is also conducted on-site.

Dimensional measurements at Pro Process LLC use automated vision systems, a Marposs gauging system, Optical Gaging Products (OGP) measurement systems, coordinate measuring machines, laser micrometry, and conventional gauges, along with flatness and concentricity testing. Some products undergo 100% dimensional inspection on at least one dimension.

The company is certified to ISO 9001:2015 and, since 2017, the automotive industry standard IATF 16949:2016, having previously held ISO/TS 16949 certification from 2004. The company was first certified to ISO 9000 and QS 9000 in 1998.

Metco places strong emphasis on training, system design, and operating procedures to maintain a safe working environment. MPIF's Powder Metallurgy Parts Association (PMPA) has awarded Metco with its Safety Award in 2021, 2022, 2023, and 2024, and the certificates are proudly displayed in a meeting room. At the time of writing, the company had achieved approximately 1,100 workdays without a lost-time accident, following a previous record of 3,500 days.



Fig. 11 Metco won a further MPIF PM Design Excellence award for this damping piston for an automotive shock absorber system. The compaction process requires several independent press functions to compact the damping piston to both the correct dimensions and mass. Special handling applications, secondary machining, and a specialty lathe and fixture are utilised throughout the process. With multi-level high precision PM compacting press capabilities, the parts can be made to near-net-shape. Due to the complexity, it would not be economical to produce using alternative manufacturing methods (Courtesy MPIF)

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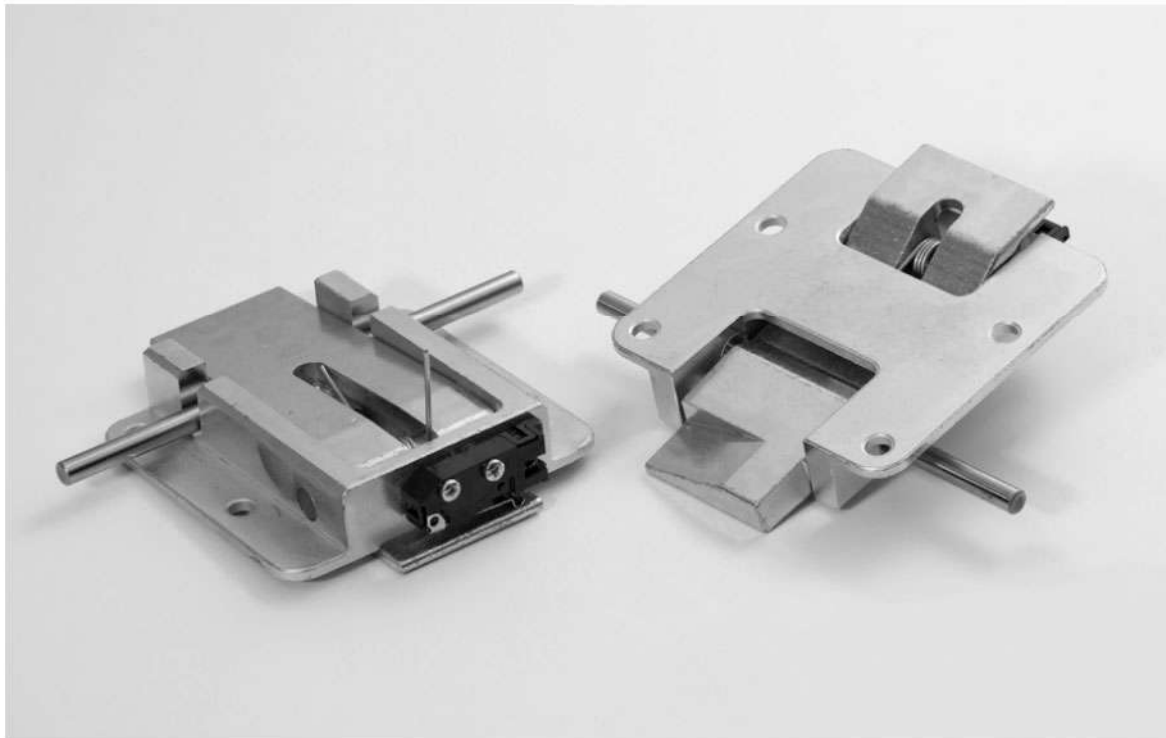


Fig. 12 Metco won a 2024 MPIF PM Design Excellence award for this heavy-duty hospital bed rail latch-lock assembly. Two PM parts are included in this nine-part assembly. The latch-lock lever is made in a single level tool that utilises a special feature to maintain the density of the ramp, which is a critical wear zone. After sintering, the parts are milled, heat treated, and plated. Maintaining flatness and minimising warpage is a challenge with the given wall thickness. The infiltrated parts are resin impregnated prior to zinc plating and this provides a sterile surface unlikely to absorb contaminants in a hospital environment (Courtesy MPIF)

An on-site Sustainability Coordinator oversees environmental programmes, employee engagement and operational practices. Through ongoing engagement with EcoVadis, Metco aims to advance its environmental initiatives, strengthen its social responsibility, and reinforce effective governance, all in line with its long-standing principle of Global Excellence, Local Pride. Liptak mentioned that through a variety of initiatives, the factory has reduced its electricity consumption by around 20% over the past three years.

MPIF involvement

As one of the leading PM manufacturers in North America, Metco Industries actively participates in the Metal Powder Industries Federation (MPIF). Brennen, a recent recipient of the APMI (the professional and

educational arm of MPIF) Fellow Award, serves on the organisation's Board of Governors and chairs the Finance Committee. He is also a past president of the Powder Metallurgy Parts Association (PMPA). Kenneth Schatz, Vice President, Sales, serves on the MPIF Industry Development Board, and Jason Forster, Metallurgist, is a member of the Standards Committee.

Metco is also a member of the Center for Powder Metallurgy Technology (CPMT), which coordinates and funds R&D projects of importance to the Powder Metallurgy industry.

Discussion

The statement printed on the back of Metco Industries' business cards – "Global Excellence, Local Pride since 1982" – expresses how the company

views its role within both the PM industry and the local community. Having visited this area of Pennsylvania several times for APMI West Penn Chapter events and to interview companies for articles such as this one, the author is struck by how the leaders of these privately held firms have combined impressive business growth with a clear sense of responsibility to provide a safe and enriching environment not just for their employees but also the wider community, and indeed they see it as an integrated whole.

During the discussion with Brennen and Liptak, the author raised the subject that MPIF's annual North American statistics generally indicate a flat or slightly declining volume of business, at least as measured by powder tonnages. At the company level, however, performance diverges: some businesses – including Metco – are very

successful while others struggle, often with broadly similar product lines. What makes the difference? Brennen and Liptak highlighted the fact that Metco mitigates the financial risks of overexpansion by investing only when justified by business expectations. Its physical growth has occurred in six incremental stages over the past forty years, with a seventh stage anticipated, and major equipment purchases have followed the same principle. Investment during slower market periods helps the company secure favourable pricing and equipment lead times, ensuring capacity is ready when demand increases.

Brennen and Liptak also attribute much of Metco's success to employee loyalty and experience. Liptak provided detailed data showing that 25% of staff had more than twenty years' service, 17% between ten and twenty, 16% between five and ten, and 38% less than five years. Business growth, hands-on, knowledgeable management, and a strong emphasis on safety contribute to strong retention.

Liptak himself exemplifies this culture. He joined Metco as an operator in 2003 and later transitioned into the design engineering area, with the company's support to complete a degree in Engineering. In 2012, he transitioned to a production management role, being subsequently promoted to his current position as Plant Manager.

Being privately owned and closely managed are factors that Brennen and Liptak believe make it easy to do business with. Decisions are made quickly, supported by a practical understanding of PM and customer needs. Its willingness to accept small production runs – as previously stated, sometimes as few as twenty-five parts – has often led to larger long-term orders.

The author would note that, given the relatively long die change times on older presses, this flexibility is made possible by Metco's large number of presses. Ample press and furnace capacity, in-house die design staff expertise, and a high level of

vertical integration – from powder blending through to final machining and, for some products, assembly – all contribute to short lead times.

It is clear that extensive in-house maintenance, die refurbishment, and equipment rebuild capabilities support cost control and increase effective plant capacity. In several production and inspection steps, automation is used extensively for materials handling. The company predominantly focuses on ferrous press and sinter production, with limited stainless steel and copper alloys to support existing customers as single-source suppliers. Production is entirely press and sinter, relying exclusively on conventional belt sintering.

Adding value beyond tonnage

Metco maintains a well-diversified customer portfolio, with around 20% of output exported. Within the automotive industry, most business is in steering, suspension, and braking components – areas largely independent of drivetrain type. This balance contributes to overall resilience.

Interestingly, Liptak provided data showing the weight of powder processed and the number of parts pressed over ten years. Although there are some annual fluctuations, the overall quantities have remained broadly consistent. Yet it is evident that Metco Industries has grown significantly during that time.

It is important to recognise that physical tonnage and part count are helpful indicators, but they do not tell the whole story. In Powder Metallurgy, advances in powder atomisation, lubricants, die and press technology, and sintering control have combined to improve dimensional accuracy, often eliminating the need for repressing and reducing subsequent machining. These improvements can also lower the total weight of powder or sintered blanks required for a given finished component.

Equally, companies such as Metco, which have integrated forward into machining and assembly, add greater value to their products through higher precision and enhanced functionality.

In all, it was a great half-day spent at Metco Industries, and it will be good to see how the company continues to prosper in the years to come!

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