

Gasbarre Products, Inc: Three generations of press and furnace expertise in the heartland of North America's PM industry

West-central Pennsylvania, USA, boasts the largest concentration in the world of PM parts manufacturers. As a result, it is also home to many of the largest material, equipment and solution providers that serve them. Among the best known of these is Gasbarre Products, Inc., manufacturer of a range of presses and furnaces that have served as the workhorses of this industry for decades. Bernard North visited the company and spoke to Alex Gasbarre (CEO), Mark Thomason (International Sales Manager), Heath Jenkins (president – Press and Automation), and Mark Saline (president – Sinterite and C.I. Hayes), about Gasbarre's history, present, and plans for the future.

George Gasbarre began his career in the PM parts and associated press and furnace manufacturing industries and, after several years in the field, he came to believe that there was a need for a press manufacturer focused specifically on the needs of PM parts manufacturers. In 1973, he launched his own company, specifically the Gasbarre Press Division, from the back of a gas station in Falls Creek, Pennsylvania. Sons Tom and Bill (both still very active in the business) recall pumping gas to help cash flow during the fledgling company's early days.

Initially, the company brought in press frames from an external supplier to use as the basis for mechanical compaction and sizing presses, but progressed to integrated press manufacturing, and, in 1980, moved a few miles to their current DuBois headquarters and press manufacturing site (Fig. 1).

The company grew organically in the following years, and made

strategic purchases of other press companies, as well as acquisitions in the synergistic press tooling and furnace areas. Table 1 shows the company's acquisitions by calendar year.

These acquisitions were carried out mindfully, with great attention to continuity of business to minimise any customer disruption, and, in some cases, with an extended period of manufacturing at the acquired



Fig. 1 Gasbarre HQ in DuBois, Pennsylvania, USA [Courtesy Gasbarre Products, Inc.]



Fig. 2 Founder George Gasbarre, pictured with a Gasbarre press in the company's early days [Courtesy Gasbarre Products Inc.]

“West-central Pennsylvania is a very stable, family- and community-oriented area – mostly quite rural but with a strong manufacturing base, which, in turn, allows job openings to be filled quite readily with reliable people.”

Year	Company	Location	Business type
1989	Sinterite	St. Mary's, Pennsylvania	Custom sintering furnaces
1997	McKee Carbide Tool	Olanta, Pennsylvania	Precision tooling
1999	PTX Pentronix	Plymouth, Michigan	High speed mechanical compacting presses
2000	Best Hydraulic Press	Castle Hayne, North Carolina	Hydraulic compacting and sizing presses
2002	SIMAC Ltd	Rugby, UK	Dry bag cold isostatic presses
2003	C.I. Hayes	Cranston, Rhode Island	Conveyer, pusher, and vacuum furnaces
2011	J.L. Becker	Plymouth, Michigan	Heat treatment furnaces
2012	Major Powdered Metal Technologies	Livonia, Michigan	Press tooling

Table 1 Gasbarre's acquisitions by year

company's site before relocation. Two of the acquired business sites, and most of the brand names, have been retained to this day.

Gasbarre in the present day

Over time, the acquired businesses' manufacturing has been consolidated in three Pennsylvania locations, in and around the state's key PM manufacturing locations of St. Mary's, Brockway, Ridgway, Emporium, and DuBois. The company's press manufacturing and headquarters are located in DuBois, its furnace making is located in St. Mary's, and its press tooling production is situated in Olanta. Together, its facilities boast a total manufacturing floor area of 14,000 m² (150,000 ft²). In addition, there are engineering, sales, and service centres in Livonia, Michigan, and Cranston, Rhode Island. The Livonia site also has two test furnaces to enable the demonstration and proving out of heat treatment cycles. The company maintains several authorised distributors internationally; in Asia, its authorised distributors provide most of the service and support, but elsewhere customer support is offered directly from central locations.

Group sales are currently approximately \$45 million per annum (and growing) and, as of mid-December 2021, the staffing level was 175, plus eleven recruitment openings. Geographically, the company's sales are currently made up of approximately 85% North America and 15% overseas. By product type, the sales split is 50% furnaces, 40% presses/tooling, and 10% contract manufacturing, fabrication, and assembly. Approximately 50% of sales are for new capital purchases by customers, with the rest consisting of 'aftermarket' service, equipment upgrades and tooling. By market area, the mix varies, but for the eighteen-month period prior to December 2021 it was, per Fig. 3, approximately 26%

automotive, 22% general industrial, 10% lawn and garden, and 7% each for aerospace, electronics, medical, and military, with the remaining 14% spread across multiple industries.

The keys to Gasbarre's success

The author spoke to the company's leadership about what they felt were the reasons for Gasbarre's success. The factors they mentioned run the gamut from its employees to its business practices, further detailed below.

People and community

West central Pennsylvania is a very stable, family- and community-oriented area – mostly quite rural but with a strong manufacturing base, which, in turn, allows job openings to be filled quite readily with reliable people. The company conducts extensive training of its workforce and participates in external education through JEFF TECH (Jefferson County – Dubois Area Technical School), Penn State Continuing Education, Triangle Tech, and local high schools. Gasbarre practices an active Solutions Program, where employee proposals of improvement ideas are strongly encouraged and reinforced (Fig. 4).

Alex Gasbarre spoke highly of the company management's experience and ability to empathise with its customer's needs, as well as the quality of the wider workforce. "Our leaders are very experienced, including at companies typical of those who purchase Gasbarre products – they have 'walked in the customer's shoes' and know what is important," he explained. "The workforce has an excellent work ethic, and is very experienced and loyal, with an average service level of thirteen years – twenty-one of them with over thirty years."

Service offering

The company management explained that the press and furnace businesses maintain dedicated instal-

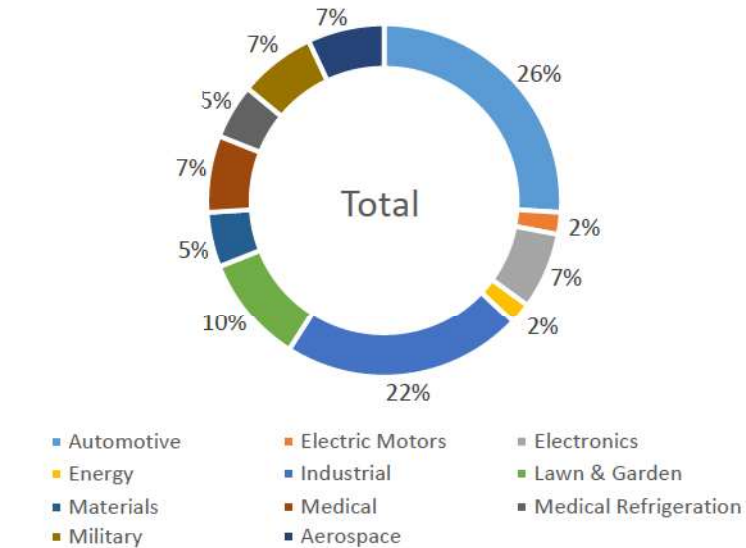


Fig. 3 Market segmentation of Gasbarre's business

lation, scheduled maintenance, calibration, service, training, and support teams. These specialised teams endeavour to resolve customer issues quickly and comprehensively, and maintain detailed lead-time metrics to heighten visibility. Approximately one third of unplanned 'press down'

situations (in which a press is unable to run) involving Gasbarre presses, including those requiring replacement parts, are resolved in less than five business days, and 50% within eight business days.

Fig. 5 illustrates the time-to-resolution for all service calls from August 2016 to November 2021.



Fig. 4 Heath Jenkins (president - Press and Automation) with Solutions Program Awardee of the Month Jeff Ogden

Gasbarre time to resolution (2016-2021)

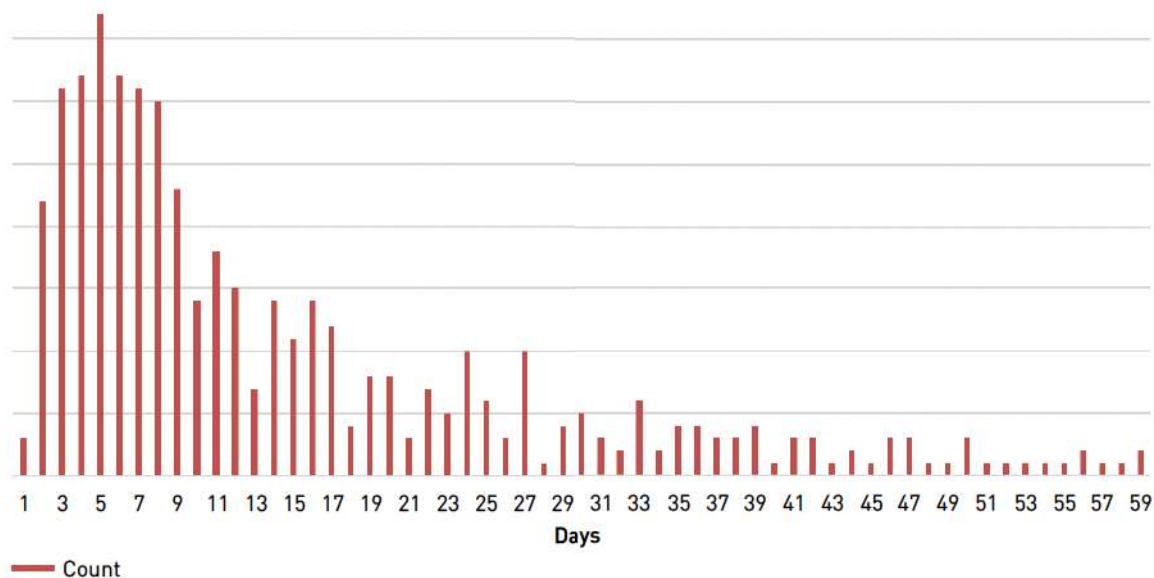


Fig. 5 Time to resolution for all service calls by Gasbarre over a five-year period

While always very important, service speed and quality have become increasingly vital in recent years, as some customers have lost critical internal skills as a result of early retirements or hiring difficulties, especially since the outbreak of COVID-19 in 2020.

Vertical integration

As much as possible, the management explained, Gasbarre keeps design, parts manufacturing and assembly in-house. Where external suppliers are employed, they are mostly US-based. This helps to control the quality, cost and lead times of its offerings.

Lead time / work-in-process visibility

During the DuBois plant tour, Heath Jenkins pointed out highly visible, real-time monitor displays showing the status and schedule details of different jobs, a key aspect of the company's flow management system. Along with vertical integration, established vendor relationships and other factors, this contributes to a short lead time averaging about six months for a complex and highly customised offering of presses and furnaces. In

both product areas, the first three months of lead time are predominantly for design, design review, and component manufacturing or sourcing, while the second three months is primarily for assembly, wiring, testing, finishing, shipment and installation.

A versatile product range

Through a combination of acquisitions and organic developments, Gasbarre's management explained, the company offers a very large range of products, which allows it to specify the proper machine for the technical application, and also assists the company in an economy of scale sense, both internally and in its share of customers' business. Most products are customised to some degree, reflecting the individual needs and preferences of customers, but generally from standard modules and sub-assemblies, avoiding unnecessary complexity and the need to 'reinvent the wheel.'

Product performance, capability, and automation

It is clear that Gasbarre's presses, tooling, and furnaces are modern products, fully competitive in their

respective markets. In today's world, this is a prerequisite for doing business. Indeed, a large and growing proportion of customer purchases are of presses and furnaces with materials handling automation packages included. Most customers prefer to do 'one-stop shopping' and avoid the need to integrate an automation package from a third party themselves, and/or the inconvenience of going through additional capital authorisation processes.

Market diversification

While readers of *PM Review* will mostly be involved with the Powder Metallurgy side of the business, and it is a critical part of Gasbarre's business (accounting for approximately 35% of sales), their press business also serves the engineering and electrical ceramics industries, while the furnace business serves a broad range of heat treatment processes besides sintering. Further diversification comes from the broad range of end-user industries served, as shown by Fig. 3. Additional revenue comes from contract manufacturing, which, to some degree, can be modulated to reflect changes in the workload in the press and furnace businesses.



Fig. 6 A group of five Pentronix high-speed mechanical presses in DuBois press assembly and test shop



Fig. 7 Mechanical presses with robotic automation in production

The impact of COVID-19 on Gasbarre

As previously reported in a *PM Review* article from PowderMet 2021, COVID-19 had mercifully little effect on the PM capital equipment area, with a strong order book entering the pandemic counterbalancing a temporary downturn in new orders. This is not to say that the pandemic did not affect and, at the very least, inconvenience PM supplier businesses such as Gasbarre.

In the initial phase of the pandemic in early spring 2020, when US companies were instructed by government order to close, Gasbarre received an early waiver as a critical business, but experienced some complications with installation, maintenance, and servicing at times due to travel restrictions. On the positive side, Mark Thomason explained, "The company has supplied presses for manufacturing of insulating panels for refrigerated packaging of vaccines."

As aforementioned, the already-apparent trend of customers losing in-house skills was exacerbated by the pandemic, and this has made Gasbarre's servicing, training, and support functions even more important than before.

Trade show attendance has, of course, been impacted by the pandemic. In typical years, the company would exhibit at between six and eight shows for presses and three or four for furnaces, but since 2020 this has been much reduced. At the time of writing this, however, there are positive signs of things returning to normal – Gasbarre exhibited at Powdermet 2021 – but there remains some uncertainty. Gasbarre has been quite resilient against supply chain issues (which dominated the news in the latter half of 2021) due to its high degree of vertical integration and use of mostly domestic external suppliers, but, more recently, the company has been encountering some problems with electronic components sourced from overseas. The leadership mentioned, however, that "several of [their] customers were being severely impacted by rationing of hydrogen gas supplies, in some cases having to shut down production for a week per month."

Press offering and technical trends

Presses are manufactured at the DuBois location (see Figs. 6 and 7). Machining, grinding, and sheet metal bending and cutting operations, as

well as parts storage, are contained in the rear of the headquarters building, while assembly, testing, and painting is carried out in a newer building a short distance away. According to Mark Thomason, "The company, including those it has acquired, has shipped about 4,000 presses in total, most of which are still in operation, encompassing about seventy-five countries and over 3,000 customers."

Reflecting Gasbarre's organic developments as well as acquisitions, the product range offered is very broad overall range in terms of both size (between 2 and 1,200 tons) and type – mechanical, hydraulic, and electric uniaxial presses, as well as dry bag isostatic presses. Applications are also broad – PM parts, engineering and electrical ceramics, cemented carbides, heavy metal, magnets, chemicals, and according to application and press type either simple or complex, multi-level tooling may be used. Some presses are used for sizing rather than parts compaction.

Key technical trends include a shift towards electric presses, individual servos on mechanical or hydraulic presses, user-friendly, in-house developed HMIs (Human Machine Interfaces) aiding setup, monitoring, and adjustments, greater precision and repeatability



Fig. 8 HMI (Human Machine Interface) on a dry bag isostatic press

(position tolerance $\pm 8 \mu\text{m}$ (0.0003 in); accuracy $\pm 1 \mu\text{m}$ (0.00005 in)), and flexibility of use. Gasbarre's in-house capabilities, combined with a network of key providers including Rockwell, Siemens, and Bosch-Rexroth, allows the company to stay at the vanguard of modern developments (Fig. 8). In a typical month, Gasbarre ships three new presses and one which has been rebuilt. As an example, at the time

of the author's visit, the assembly area held eight new and one rebuild press in various stages of completion, six destined for the PM industry and three for ceramics. The majority of presses are custom built to order; however, a small inventory of finished presses can exist at any given time – at the time of the author's visit, a PTX Pentronix high-speed mechanical press and a SIMAC dry bag isostatic press were in inventory.



Fig. 9 PM press tooling manufactured by Gasbarre at its Olanta, Pennsylvania plant

Press tooling

Press tooling, made from both tool steels and cemented carbides, is manufactured at the 2,800 m² (30,000 ft²) Olanta plant, with a staff of about thirty-five (although some are resident at customers' facilities). Press tooling is designed and built for a range of loads from 2 to 800 tons. The plant came from the acquisition of McKee Carbide Tool in 1997, and it also incorporates equipment and products from Major Gauge & Tool from its 2012 acquisition, with the move completed in 2019. The tooling is used by customers on both Gasbarre and other companies' presses (Fig. 9).

The plant operates conventional machining and grinding, as well as high-speed milling, plunge EDM, and fine polishing processes. Besides press tooling, the plant manufactures components for the DuBois and St. Mary's plants.

Furnace product range

Furnace manufacturing is conducted in a single building at the former Sinterite facility in St. Mary's, and a large range of furnace types are made in the plant, reflecting the three key furnace company acquisitions and subsequent organic developments. Reflecting on the company's success as a furnace maker, Mark Saline stated, "Gasbarre, including the companies which it has purchased, has shipped over 8,000 furnaces, and most of them are still running. The oldest one I know of is a Hayes vacuum furnace from the 1930s, where the customer recently asked for some spare parts." Typically, three or four furnaces are shipped to customers every month. Most are new; about 10% are rebuilds, while most replacement of worn-out components (for example, muffles) is done at the customer's site. By brand and furnace types:



Fig. 10 PM parts entering a mesh belt sintering furnace

Sinterite continuous belt furnaces (mesh belt for PM parts, metal sheet for powders)

Used for sintering and a variety of other heat treatment processes at up to approx. 1500°C (2700°F). They range in size from small lab units (one has an approx. 8 cm [3 in] wide belt) to very large production units (examples including a 34 m [110 ft] long mesh belt PM sintering furnace with a 1 m [39 in] wide belt, and a 30 m [100 ft] long sheet belt powder processing furnace with a 1.3 m [50 in] wide belt). Sinterite-branded furnaces also include pusher and other types (Fig. 10).

C.I.Hayes vacuum furnaces

Capable of heat treatments at up to approx. 1650°C (3000°F), available in both single- and multi-chamber batch and continuous types, again for a wide variety of thermal processes. A batch furnace for tungsten parts sintering was on the floor at the time of my visit.

J.L. Becker

Now rebranded Industrial Furnace Systems, atmosphere heat treatment batch furnaces of various types, for a wide variety of thermal processes, primarily for non-PM applications.

At least two physically very large units were under construction at the time of the author's visit, one being a tip-up type that one could, quite literally, drive a full-size pick-up truck into!

The St. Mary's plant also manufactures ancillary equipment including washers, dryers, rapid quench units, ammonia dissociators, endothermic and exothermic gas generators, steam treaters and oil impregnators, consistent with the company's policy of providing full process systems, not just individual pieces of equipment, to its customers. As with the DuBois plant, the St. Mary's facility has its own booth for painting equipment after it has been tested and partially disassembled.

Trends apparent in the furnace business include a shift towards more vacuum furnaces (especially associated with titanium, including powder for Additive Manufacturing), user-friendly HMI's for programming and monitoring, sophisticated sensors and monitoring for data trending and tracking. As with the presses, most furnaces are custom-built to order, but standard units are sometimes held in stock. At the time of the visit, a small nitriding furnace was in inventory.

Automation

Besides the specific technical trends noted individually for presses and furnaces, a clear trend towards materials handling automation is very apparent for both equipment families, and Gasbarre frequently provides equipment capable of robotically handling load, unload, part inspection, palletising etc. According to Alex Gasbarre, "About 40% of presses and 10% of furnaces have automation packages included up-front. About 75% of such automation packages are included with new equipment, while about 25% are retrofits to existing equipment. We expect automation to continue to increase for both new and retrofit applications."

Contract manufacturing

Design, modelling, machining, grinding, metal bending and cutting, welding and other internal capabilities, as well as established vendor and customer relationships, allows Gasbarre to maintain a significant contract manufacturing business which, besides its importance in its own right, helps the company through any lean periods in its

primary presses and furnaces businesses. At the time of the author's visit, large, welded metal chutes were being manufactured for a graphite electrode manufacturer.

Quality control, health and safety and sustainability

Each of Gasbarre's businesses is separately certified to the ISO 9001 – 2015 quality standard (with the company first being certified to ISO 9001 in 1996). In addition, the St. Mary's plant is certified to the ISO 17025 calibration and testing standard (first having been certified to ISO 17025 in 2013), and designs equipment to meet the CQI 9 automotive heat treatment, and AMS 2750 pyrometry, industry standards.

The company takes employee health and safety very seriously, with lockout/tagout and rigging training being highly emphasised; in 2021, there were just three minor lost-time accidents, and all three Pennsylvania locations received PMEA safety awards for 2020. Recent examples of power consumption reduction (and lighting and noise improvements) in manufacturing include the replacement of fluorescent lighting with LED tubes and upgrading of air compressors. A metal plasma cutting unit used by Gasbarre will soon be replaced with a laser cutter, giving much more precise cuts and thus obviating some machining operations.

On the product side, the general shift to electric presses, as well as localised servo hydraulic actuators on presses, and servos for die and top ram motions on mechanical presses, all reduce the customers' energy needs as well as cutting footprint and noise. For furnaces, examples include replacing pilot lights on gas furnaces with glow plugs. The provision of comprehensive gas flow and temperature monitoring equipment allows fine-tuning of cycles, which minimises energy usage.

Involvement in industry associations

Gasbarre has a long history of involvement with the Metal Powder Industries Federation (MPIF) and American Powder Metallurgy Institute (APMI), with many past and present staff taking key responsibilities within the associations over a long period of time and receiving awards for their service to the PM industry. The 2019 Members Directory lists twenty-one Gasbarre staff as APMI members, and several leadership staff are currently active on committees and/or with training and technical conferences. For example, Bill Gasbarre is chair of the MPIF Conference Committee and MPIF Technical Board, as well as serving on the MPIF Technical Program Committee, APMI International Fellow Award Committee, and APMI International PMT Certification Commission.

The largest local chapter of APMI is the West Pennsylvania chapter, and Gasbarre is very active in sponsoring meetings and providing financial support to special events. (A note to *PM Review's* readers – if you should ever get the chance, try to attend the West Penn APMI Chapter Annual Seafood Picnic held in September each year – as many crab legs and shrimp as you can possibly eat, and a plethora of raffle prizes, all in the excellent company of about 450 good-humoured colleagues from the Powder Metallurgy community!)

Conclusion

From its roots at a Pennsylvania gas station, Gasbarre has grown to become a major player in presses, furnaces and other industrial equipment used in the PM and associated metallurgical and ceramics industries. It has done so by not losing sight of its community and the people therein. By leveraging their knowledge and experience, it is able to provide equipment which reflects industry trends while maintaining the

high-quality technical performance and capabilities for which Gasbarre products are known, at short lead times, as well as providing high-level customer service. The company has grown through three generations of leadership from the Gasbarre family, and anticipates a fruitful future.

Contact

Gasbarre Products, Inc.
590 Division Street
DuBois, Pennsylvania, USA
15801

Tel: (814) 371-3015
inquiries@gasbarre.com

Author

Bernard North
North Technical Management, LLC
Greater Pittsburgh Area
Pennsylvania, USA

bnorth524@msn.com