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FORGING AHEAD: WORLDWIDE DEMAND FOR FORGED PARTS SPURS DRIVE TO REBUILD EQUIPMENT



With forged part demand ramping up worldwide, working with an experienced OEM to rebuild equipment is often the fastest, most cost-effective way to increase production.

This month's industry spotlight is brought to us by Del Williams, a technical writer based in Torrance, California.

Today, global demand for rebuilt forging equipment is surging. Robust demand for forged components is expected to increase in the automotive, aerospace, and power generation markets through the end of this decade. According to Grandview Research, the global metal forging market valued at USD 74.36 billion in 2021 is projected to grow at a compound annual growth rate of 7.7% from 2022 to 2030.

To meet this demand, forgers are dusting off sometimes decades-old unused or underutilized forging equipment and seeking complete rebuilds from the Original Equipment Manufacturers (OEMs) to ramp up production quickly, even if new forging equipment is ordered and on its way.

“Rebuilding is often the fastest, most economical means to get worn or mothballed equipment back into production when purchasing new equipment may not be feasible. As such, it can bridge a gap in production before new equipment can be purchased, manufactured, and delivered,” says Justin Wildfire, Rebuild Engineer, Products and Part Sales, Ajax-CECO-Erie Press (ACE), the largest forging equipment supplier in North America, with over a century of experience in custom designing and building presses and forming machines.

A forging's versatility of size, shape, and properties also makes it an ideal component in various applications and sectors of the economy. Given the demand, several scenarios could lead manufacturers to rebuild forging equipment instead of purchasing new, according to Wildfire.

Rebuilding is reconstructing a machine by removing all its parts and repairing or replacing them with OEM components to return them to manufacturer specifications. This can include replacing high-wear items such as bearings, bushings, seals, and liners and inspecting and repairing the frame.

Rebuilding is often more efficient and cost-effective than purchasing new and is ideal for quickly getting equipment operational again in as little as a few months. Consequently, forgers opt to rebuild aging forging equipment, which can date back to the 1920s in some instances.

In some instances, the forging equipment may no longer be in use, requiring updating, modifying for new product lines, or servicing to be restored to original specifications. A rebuild can also increase the production capacity of slow, inefficient, or unreliable equipment.

According to Wildfire, the high-impact nature of forging eventually takes its toll over time. When this

occurs, parts will inevitably need to be replaced, and a rebuild may be the best solution to extend the life of the forging equipment.

At this point, the choice is to contact the OEM to rebuild the equipment or contract with a third-party rebuilder. The decision is significant, given the need for a complete, dependable rebuild that will perform as expected for many years.

Rebuilders often use a reverse engineering process to create their parts or have them machined at local CNC shops. Although this approach may work in the short term to "get the equipment up and running," it ignores the long-term view.

Even rebuilders with experience working on various other types of equipment, such as stamping presses or injecting molding machines, may only partially appreciate the forces exerted during the forging operation.

According to Wildfire, critical engineering design data is lost when an independent rebuilder reverse-engineers a part, resulting in inferior part construction and premature wear or component failure. "Often they are rebuilding a machine without truly understanding the original design intent or the loads that will be placed on the parts and equipment," he says.



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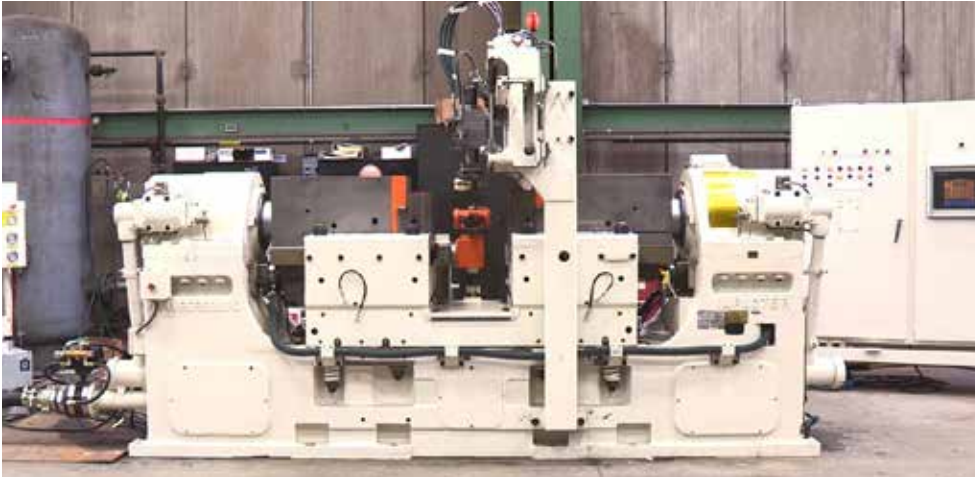


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“If a 60-year-old forging machine had a secondary heat treat surface coating as part of the original design specification that wore off over the years, it would not be apparent to a third-party rebuilder. Not adding a replacement surface coating during a rebuild could compromise longevity. However, the OEM keeps documentation on all modifications, which will be reviewed when replacing parts,” says Wildfire.

Without the benefit of the original design specifications, there is the risk of a wrong or sub-optimal part being used in the rebuild. Given the loads placed on a forger, even minor material changes can significantly affect equipment longevity.

Consider that forging equipment has to take the highest impact and accept the highest pressure of any metal-forming equipment. Simple aspects of a design, like the size and placement of a corner radius, can affect the longevity of a component.

There is also the risk of working with a rebuilder who takes shortcuts. A conscientious rebuilder will try to reverse engineer how the forging equipment was built, which may lead them to contact the OEM to source the correct part and access engineering drawings. However, some shops will apply a fresh coat of paint and not do all the work needed.

An incomplete or incorrect rebuild can be very costly to a manufacturer. Forging performance may be sub-optimal, the forging equipment may operate less efficiently, and the life of the equipment may be shortened. Often, there is no warranty offered on the rebuild. Notably, there can also be operator safety risks and OSHA compliance issues.

Instead, as an alternative, it can be advantageous to work with the OEM for an equipment rebuild. The OEM has the original design specifications, critical materials, and clearance specifications to jump on rebuilds and quickly finish the work. A vast range of information is required for a quality rebuild, such as critical data on high-wear parts, the material grade of the steel, the heat-treating process utilized, and the required clearances used in the engineering of that forger.

With large spare part inventories, choosing an OEM can reduce service times compared to going to a rebuilder, who would first need to purchase a piece of steel and then machine it. The parts and the rebuild are also backed with a warranty from the OEM.

In addition, a rebuild can include significant automation upgrades when working with the OEM. For example, tasks once performed manually – such as moving heavy steel rods, pipe, and other stock in and out of equipment – can be automated to improve worker safety. Many manual tasks can be replaced with a robot’s mechanical “hand” or by integrating servos that lift, insert, and deposit materials. Even tasks such as automated tooling changes can be completed with the push of a button.



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Rebuilds can be approached in several different ways. The forging equipment can be sent to the OEM for rebuilding; the OEM can send repair personnel to the manufacturer’s facility to rebuild equipment on-site, or the OEM can supervise a rebuild by maintenance staff. This allows the in-house staff to ask questions and better understand the operation of the equipment they are maintaining.

According to Wildfire, the OEM will typically perform a quick initial assessment of the forging equipment to determine how “true” it is if it is running. This involves measuring squareness and parallelism and checking for cracks and failure points. Afterward, the scope and timeline of the rebuild can be jointly determined by the OEM and the customer based on their requirements and priorities.

Since a manufacturer can have various types of forging equipment that need rebuilding, it can be advantageous to work with an OEM with the expertise and experience necessary to reliably bring a wide range of systems back to full productivity.

ACE, for example, has spent the past two decades acquiring established forging equipment brands and can now service, rebuild, or refurbish forging machines from Ajax, Chambersburg (CECO), Erie Press, and LNF as the OEM. In addition, they similarly service all other brand-name forging equipment.

“The full range of forging equipment can be rebuilt by ACE, whether hammers, mechanical presses, hydraulic presses, or stretch forming equipment,” says Wildfire.

On a recent rebuild, Wildfire reviewed the engineering drawings of a hammer originally designed by Erie Press in 1927. The hammer was still in production, and the user sought to rebuild its top-end cylinder with some seals and rings.

“We provided engineering assistance to determine which parts needed to be replaced. The serial number led us to a set of prints developed around 1927. And we have worked on older machines than this,” says Wildfire.

ACE also recently rebuilt an Erie Press hydraulic sizing press and a Bliss mechanical press for the government. ACE is rebuilding several vertical hydraulic press lines for the same facility.

As manufacturers consider how to meet the rising production demand for forged parts, rebuilding their equipment with the OEM will often be the fastest and most economical choice.



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THE IMPORTANCE OF SUSTAINABILITY IN MANUFACTURING

Sustainability in manufacturing has been a big topic for many years now and there's good reason for it. With more and more pressure being put on businesses around the world to reduce their carbon emissions, it's essential that those who work in sectors with high emission output, do whatever they can to reduce their overall carbon footprint.



Prashanth Mysore,
Senior Director:
Strategic Business Development

Prashanth Mysore, Senior Director: Strategic Business Development at DELMIA takes a look at some of the ways your business can become even more conscious about the impact your operations are having on the environment, as well as some of the many benefits of making your manufacturing firm more environmentally friendly.

The Virtual Twin Experience is a key differentiator in decarbonizing heavy industry processes. For instance, in green steel manufacturing Virtual Twins can help to establish fully integrated, highly automated factory with circularity, establishing green steel manufacturing processes, reducing CO₂ emissions with up to 95 percent compared to traditional steelmaking. Using Virtual Twins system modelling one can validate the replacement of coal with green hydrogen powered by fossil-free electricity, water and it is only the beginning where green hydrogen decarbonizes other heavy industries.



How can manufacturers be more sustainable?

- **Energy Efficiency:** Implementing technologies and processes that lower energy consumption and reduce carbon footprint consistently over time.
- **Waste Reduction:** Embracing a circular economy model where waste is minimized and recycled back into the production process.
- **Use of Sustainable Materials:** Prioritizing eco-friendly and recycled raw materials in production.

While the above pillars may sound obvious, it's essential that manufacturers take steps to work toward addressing each issue in order to successfully lower overall company emissions. By integrating these practices, manufacturers can ensure long-term business viability while concurrently contributing to environmental preservation.

Energy efficiency

Power the industry through renewable energy

Finding alternative ways to power your business operations is essential for manufacturers to work towards becoming more sustainable in your practices. If you are able to incorporate solar or wind energy into your power supply, you could not only save yourself a considerable sum on fossil fuel related costs, but your business will inevitably lower its carbon footprint.

Whilst the initial outlay for solar and wind power can be substantial, you are playing a key role in futureproofing your business with renewable

energy and will make cost savings on fueling your manufacturing operation over the years to come.

Create or upgrade your factory and production processes with sustainability in mind

Another key consideration when not only looking to become more sustainable as a business, but also futureproof operations, is for your business.

The benefits of upgrading your factory and production processes are two-fold, as your business will benefit from improved operations and profitability, and this will be a huge selling point to any new clients you may be looking to on board.

Waste reduction

Design and simulate production systems in the virtual world prior to physical build

A fantastic way to ensure your manufacturing firm is able to reduce waste is to simulate production systems in the virtual world, prior to committing to physical build. This takes all of the risk out of committing to, and investing in infrastructure that may not be fit for purpose. The amount of waste, in terms of both actual parts and workforce time, can be substantial if mistakes are made repeatedly. Therefore, a virtual world build is often a fantastic way to make your operations leaner and greener.

For example, DELMIA helps organizations achieve greener manufacturing by enabling the simulation of products and processes and optimizing “first time right” plans through data-driven decision-making. In supply chain planning, DELMIA helps bring sustainability to

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the forefront by measuring the relevant key performance indicators, such as pollution & CO2 emissions, scrap, and raw material usage. By adopting green manufacturing, companies can decrease carbon emissions and waste across production processes and the value network. In addition, improved materials use helps businesses lower costs and enhance their bottom line.

Use of sustainable materials

Reduce waste, recycle, and consider second-life products to achieve circular economy

Promoting a circular economy in your business is essential to meeting sustainability targets, as it enables your business to vastly reduce the amount of product waste created. A circular economy is based on the principles of reusing and regenerating materials or products, in order to continue production of products in a more sustainable and environmentally friendly way. In recent years, circular economies have become extremely popular in nearly all sectors, as businesses look for ways to cut their carbon emissions and waste products.

There are 4 key steps to a circular economy:

1. **Sourcing** – understanding material impact and external factors affecting a business. Being conscious about the raw materials you utilize and also considering the use of natural resources that aren't renewable or recyclable.
2. **Manufacture** – look to incorporate eco-friendly design into your processes, whilst also maximizing efficient manufacturing processes & distribution across your business.

3. **Use** – optimize your processes to ensure products are built to last and focus on providing your customers with a use, repair and reuse loop.
4. **Recovery** – offer collection on products at the end of their lifecycle and where possible, recycle the products.

Showcasing that you are embracing a circular economy to prospective clients can help your business stand out in a crowded market, as more and more businesses are becoming conscious about how seriously their suppliers are taking climate action. Being able to show how your products are created with end of life recycling in mind is a great way to not only reduce your overall carbon footprint, but also entice new clients with your eco-friendly practices.

There's no getting away from the fact that as manufacturers, we all need to do what we can to protect the environment.

Even making the smallest change to our existing processes can go a long way to reducing carbon emissions, so it's essential that firms take a minute to consider what aspects of their operations could be run more effectively. Doing this will not only help reduce emissions, but it may well even save you some time and money in the long run too!



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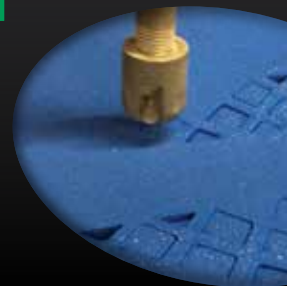
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Hutchinson Aerospace & Industry, Inc., earns ISO 50001 certification for energy management

A company-wide commitment to carbon neutrality has led to significant successes

HOPKINTON, Mass. — Hutchinson Aerospace & Industry, Inc., a world leader in the development of unique and custom solutions for shock attenuation and vibration isolation mounting systems, has been working to reduce emissions and act sustainably for the planet and future generations, with a goal to be 50 percent carbon neutral by 2030, and 100 percent by 2050. The company recently achieved a major milestone, receiving ISO 50001 International Energy Management Certificates for its facilities in Hopkinton, Massachusetts, and Ithaca, Michigan.

“This certification demonstrates the stance we are taking on saving energy, with ongoing goals to reduce our greenhouse gas emissions and our carbon footprint,” said Don English, Hutchinson’s maintenance manager and health, safety and environmental manager who led the charge for Hutchinson’s Ithaca facility. “Earning this certification has been a rigorous, year-long focus.”

Kevin Underwood, silicone and environmental manager, at Hutchinson who oversaw the certification process at Hutchinson’s Hopkinton plant, discussed some of the technology behind the company’s certification success.

“Sensors monitor energy consumption for all our major pieces of equipment,” he said. “Significant energy users—such as our chiller compressor, test lab power unit, compression presses and hydraulic power pack—are all monitored to tell us how many kilowatt hours we’re consuming every 10 minutes of operation.”

Underwood said they use that data to review energy usage on a month-to-month basis, which helps the energy management team understand the plant’s manufacturing behaviors. For example, they can see if operators are following the processes for shutting down equipment on the weekends, or where there are opportunities to replace older pieces of equipment.

“We can use the data to compare an older piece of equipment with something new, and estimate how much energy savings we can accomplish by making the change,” said Underwood. “That lets us not only tap into standard capital from the standpoint of return-on-investment

calculations, but into capital monies our corporation has dedicated specifically for decarbonization projects.”

“I think one of the biggest benefits of earning ISO 50001 certification is tracking our energy,” said Jason Bourgoïn, antivibration and noise reduction, safety and maintenance manager. “It lets us keep an eye on what we’re using, where we can save and how we can realize that savings by implementing new projects. It’s something we’ve never done before to this level. This certification is just the first step. It’s really about continually growing and improving our energy usage over time.”

English talked about the financial impact of sustainability efforts.

“Companies that aren’t paying attention to their energy usage are either paying too much for it or wasting it, and that’s real dollars, real money. Our electric bill looks a lot better now than it did eight years ago, and that’s with rates going up and everything—we’re going the other way. That’s bottom-line money.”

Underwood said that saving the company money by consuming less energy is one of many benefits of their focus on becoming carbon neutral. But he notes that at Hutchinson, the team looks beyond that.

“Ultimately, it’s a greenhouse gas reduction,” he said. “By using less power, our grid doesn’t have to supply as much and there’s less CO₂ produced. So, we are being good planetary citizens.”

English explained that meeting the company’s sustainability goals has become an integral part of the culture at Hutchinson.

“We teach our employees what 50001 is and have succeeded in getting everyone on board,” he said. “They understand the impact of initiatives like scheduling and staggering our equipment start up, to avoid high peak demands, shutting down equipment that’s not being used and turning off lights. I know that sounds fundamental, but sometimes that can be a challenge. And everybody’s embraced that idea. That’s a culture change, and I know it’s going to get better and better.”

About Hutchinson

Formerly Barry Controls, Hutchinson Aerospace & Industry, Inc., was founded in 1943 to solve shock and vibration problems for the U.S military. Acquired by Hutchinson in 2000 and serving a wide range of diverse global customer applications with extensive materials expertise, the company is recognized today as a world leader in the development of unique and custom mounting solutions needing shock attenuation and vibration isolation. Additionally, Hutchinson is now well recognized as a specialist in custom system design and analysis, innovators in manufacturing, and engineering partners with its customers. To learn more about Hutchinson, Inc., visit hutchinsonai.com.



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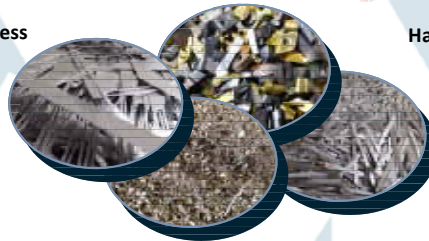
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