August 2024

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Latest Technology And Innovation Keeping Ahead In Cable Tray Systems

Who Is Zip Cable Tray Systems Inc.?

Zip Cable Tray Systems Inc. was designed in 1994 at the specific request of the telecom industry for a lightweight cable tray system that was strong, yet fast and easy to install.

Recently rebranded as Zip Cable Tray Systems Inc., the new name better reflects our superior product design and service that our company has offered for over 2 decades.

Our mission here at Zip Cable Tray Systems Inc. is to continue providing our clients with the market-leading cable tray products and excellent customer service that our company has become known for.

Made in Canada! Located in Pointe-Claire (Montreal), Quebec, Canada, our modern production facility is equipped to meet any special requirement you may have.

Zip leads the industry when it comes to cable tray systems and wire management!

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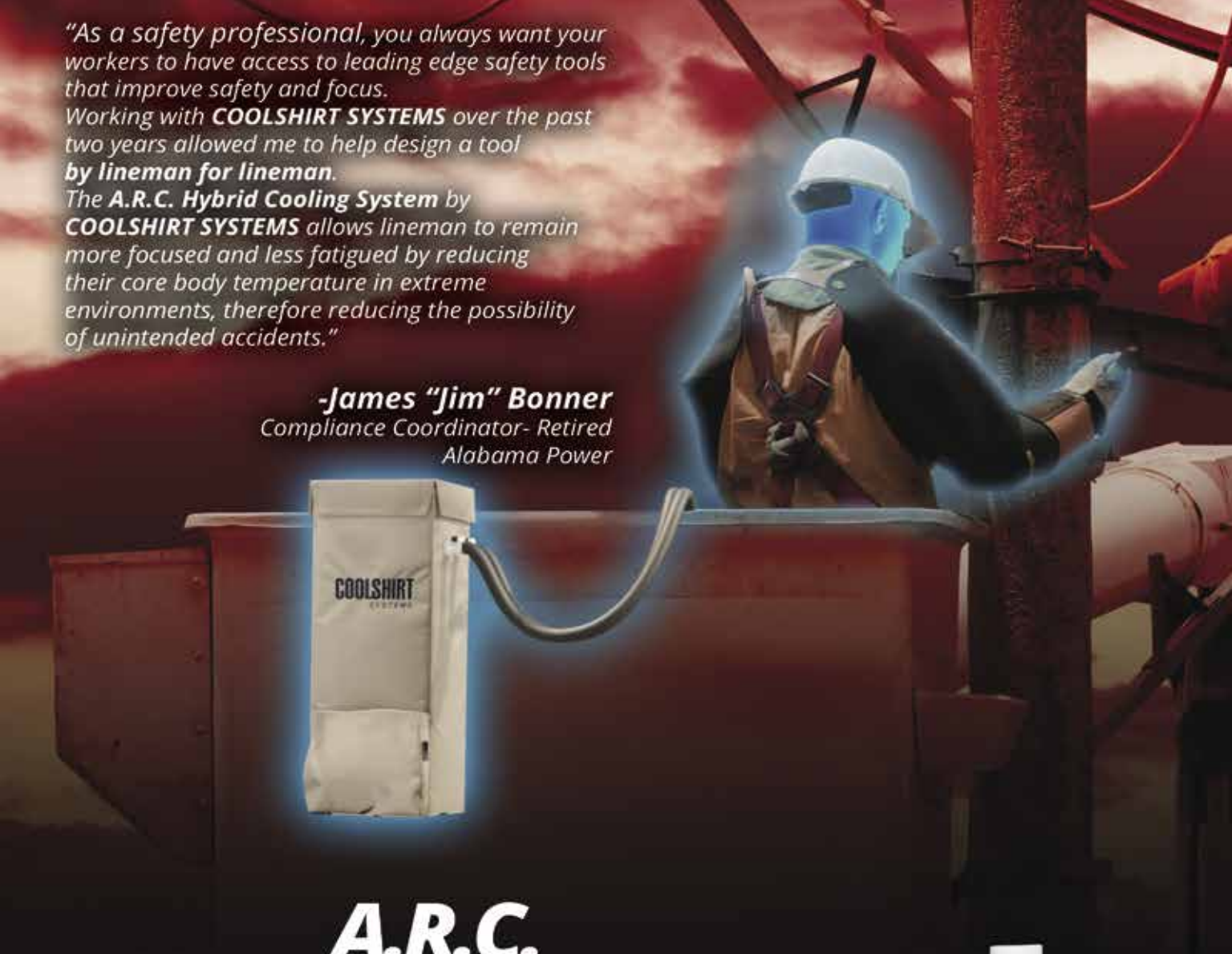
*The **A.R.C. Hybrid Cooling System** by **COOLSHIRT SYSTEMS** allows lineman to remain more focused and less fatigued by reducing their core body temperature in extreme environments, therefore reducing the possibility of unintended accidents."*

-James "Jim" Bonner
Compliance Coordinator- Retired
Alabama Power



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Behind every meticulously handcrafted Zip cable tray and cable ladder are highly skilled employees who work in a state-of-the-art facility located less than an hour from the Canadian - U.S. border and 20 kilometers from downtown Montreal.

A Canadian Company Leading the Industry / In Aluminum Cable Tray Systems & Wire Management.

Zip Cable Tray / Benefits

Fast Installation:

One of the prime features of the Zip cable tray design is that the channel-style siderails accept spring nuts. This eliminates the need for any drilling and makes for an extremely fast and simple installation.

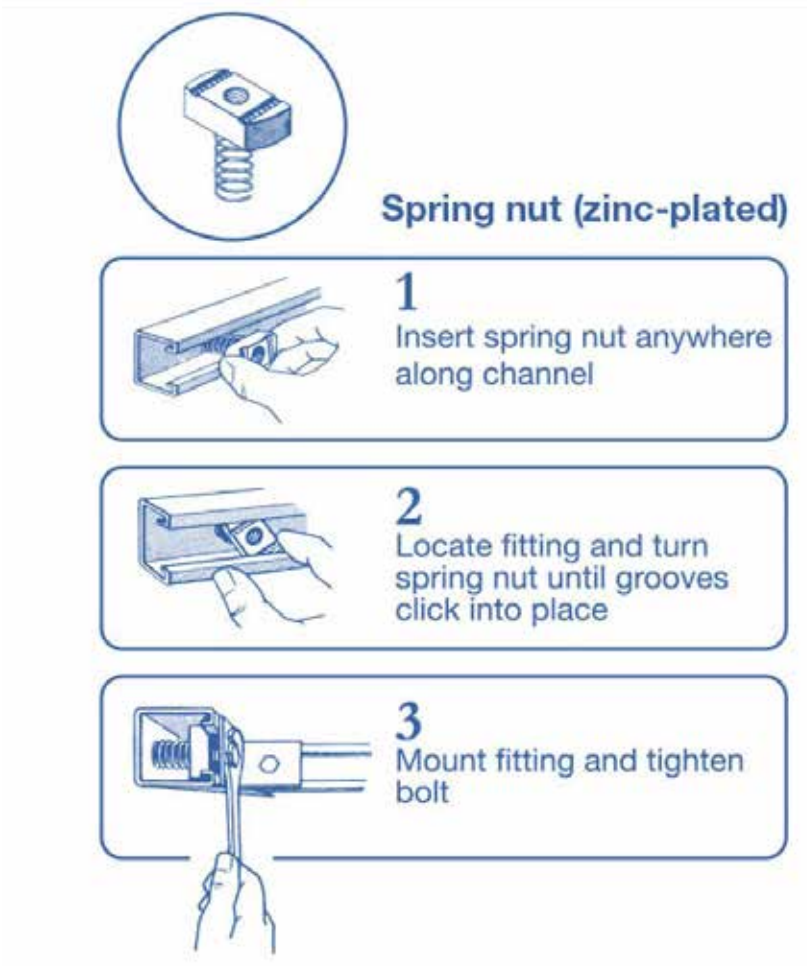
Fast Delivery:

90% of our orders ship in less than a week, a market leader! A large inventory of popular items (ladder-style cable racking) are in stock for immediate delivery.

All-Aluminum Construction:

- Lightweight
  - 1 person can easily install
  - Less weight for the whole site
- Easy to cut and easy to drill (if necessary)
- Connections do not require jumper cables across them
- Non-magnetic properties reduce induction and electrical losses to a minimum
- Very attractive looking
- No painting required
- Never any rust or corrosion problems

Aluminum cable tray systems are clearly superior in construction and appearance to electrical raceway systems made from other metals. Zip has taken that benefit and incorporated the best product design to fully utilize the advantages of aluminium.



Wire Management At Its Best With Zip

There is always a Zip cable tray and wire management solution to fit your needs.
Whether you are doing telecom work or high voltage electrical wiring, routing 1 cable or 1000's of cables, multiple levels, branching off in many different directions, Zip cable trays and cable racks will get the job done right!

We cater to many industries that all have special requirements.
Our priority is to find a cable raceway solution for your specific situation. Whether it is the low profile cable tray (BT Series) or 6" high siderail with a sweeping 36" radius, we have a solution for your project!

Zip's ladder-style cable tray is lightweight, durable and simple to install. With Zip cable tray and cable racking your wire management is in good hands.

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Test Voltage 30,000 VAC
Proof Test 20,000 VAC
Recommended 17,000 VAC

Ul Classified / CSA Approved

Zip cable tray is classified by UL and CSA/NEMA tested and approved for use in Canada and USA and complies with the electrical codes of both countries (CEC and NEC).

Powder coating with any colour is available, but note that adding a painted coating to the cable tray negates the UL and CSA/NEMA certification! Jumper cables will need to be installed across cable tray splices to maintain electrical continuity.

Electrical Continuity

Zip's cable tray systems couplings do not require additional equipment grounding conductor's (EGC), also known as 'jumper cables', across splices. This is a significant cost saving. In accordance with the harmonised CSA/NEMA cable tray standard, a strict electrical continuity test was performed on all Zip cable trays. This test measures the electrical resistance across a splice and the result must be less than 0.00033 ohms!
All Zip cable trays easily passed the electrical continuity test.

Some clients create their own, much stricter standards. For example, in order to qualify for the Motorola R56 standard, jumper cable across each splice is a necessity.

Zip Has Succeeded In Satisfying Many Industries:

- National cell phone network providers (eg: Bell, Telus, Rogers, Videotron, AT&T, Verizon Wireless, Sprint, US Cellular and T-Mobile)
- National railway company signal houses (eg: Amtrak, CN, CSX)
- Cable TV network providers (eg: CBC, RDS, Cogeco, Videotron)
- Cabling contractors
- Electrical contractors for various commercial and industrial projects, eg:

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- Solar panel installations
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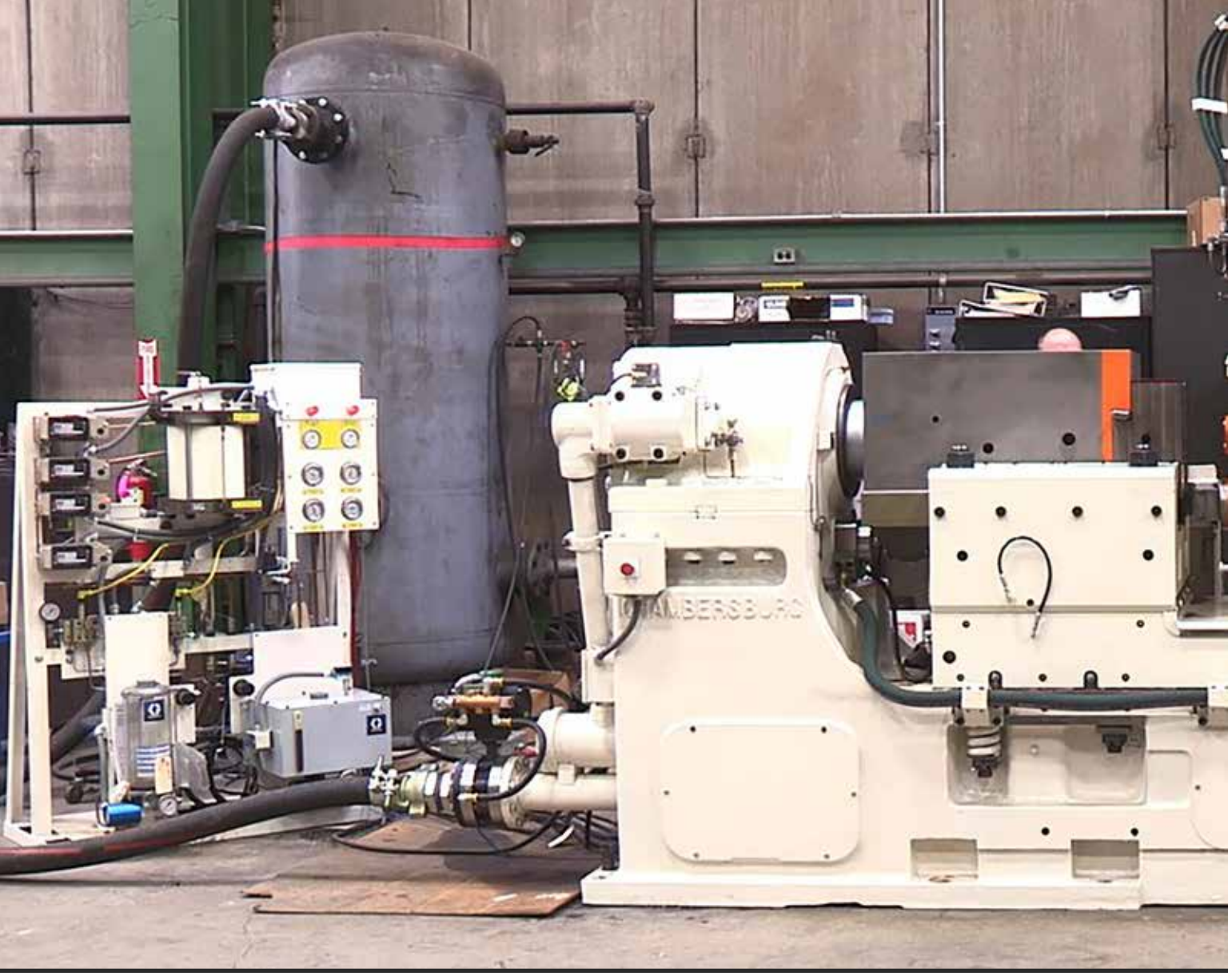

With forged part demand ramping up worldwide, working with an experienced OEM to rebuild equipment is often the fastest, most cost-effective way to increase production.

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 equip-

Forging Ahead: Worldwide Demand for Forged Parts Spurs Drive to Rebuild Equipment

By Del Williams

ment 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.

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.

"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.

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.

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.

Please visit the Ajax/CECO/Erie Press website at www.AjaxErie.com or email them at info-sales@AjaxErie.com. Or, if you prefer, call 814-455-3941.

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Purpose-Built Forged Parts Optimized for "End Use"

Working with an experienced supplier of open die forgings, seamless and contoured rolled rings, and complex forged parts that prioritizes the "end use" of the part form in the early stages of the process helps ensure quality, performance, safety, and compliance in critical applications.

When forging seamless rolled rings for diverse sectors such as industrial machinery, pulp and paper, turbines, and oil & gas exploration, it is crucial to tailor components for their specific applications, or "end use." In the realm of metal parts, this term commonly denotes the ultimate form and state of the final machined part, along with a comprehension of the operating conditions it will face during service.

"By understanding the final application or purpose – the end use – for which these parts are designed and manufactured, forged parts suppliers can determine the appropriate materials, manufacturing processes, and quality standards necessary to ensure that the metal parts perform effectively and reliably

By Royce Lowe


K52.2

in their intended applications," says Jeff Klein, Director of Sales for All Metals & Forge Group. The ISO 9001:2015 and AS9100D-certified manufacturer produces open die forgings, seamless and contoured rolled rings, and complex forged parts to industry standard specifications in 8-10 weeks.

According to Klein, open die and forgings and seamless rolled rings play a crucial role as components in gears, turbines, bearings, clutches, couplings, drives, flanges, valves, machines, and rollers for a wide variety of end uses. As such, these items must exhibit exceptional attributes such as strength, durability, precision, and resistance to fatigue, deformation, and harsh environments in saltwater or downhole uses to meet precise performance standards when deployed in the field.

In some cases, failing to consider the end use can even introduce serious risk, including catastrophic failure of a part while in operation.

For example, aircraft engines include seamless rolled rings. If such a part fails catastrophically during takeoff, flight, or landing, the engine can tear itself apart or explode, sending pieces of hot metal at high speed though the engine housing and into the plane wing, compromising structural integrity, or the passenger cabin, causing dangerous depressurization, passenger death, or an airliner crash.

In the oil and gas exploration industry, the failure of a forged part can occur more than a mile underground, causing a well shutdown and the withdrawal of the failed part that may be more than 10,000 feet below the surface. In machinery, a part failure can cripple production and a replacement part may not be obtainable for several months.

Consider End Use, from the Start

The consideration and planning to meet end use requirements should begin with the service requirements outlined during the engineering phase of design and conclude when the part is in its operating position, performing as intended.

"It is vital that the manufacturer specify the end use of each part and ensure it is communicated throughout the production chain, from the design engineer, through purchasing, the forging operation, heat treating, finish machining, and final assembly of the end use, including the mechanical property requirements and the heat or corrosive conditions in which the forged part will perform," says Klein.

According to Klein, different industries, such as food processing, paper manufacturing, machinery building, oil and gas exploration, or energy have unique specifications and standards that metal parts must meet. The specific function of the part will dictate its design, dimensions, material selection, forging, heat treating and finishing processes. In all cases, the part must be manufactured to industry standard specifications such as ASTM, AMS, AISI, or API unless the OEM has developed their own requirements by modifying one of those standards. In short, the finished product must comply with all quality, durability, chemistry, and mechanical properties within the selected standard.

Seamless rolled rings can be produced in a variety of alloys, sizes, and shapes specific to fit end use requirements. However, by collaborating closely with the forging supplier, engineers, buyers, and machinery builders can ensure the ideal selection of chemistry, mechanical properties, heat treatment, machining, and testing ultimately required

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for each part's end use.

The process often begins with the selection of the alloy grade used in for open die forging or seamless rolled ring production, which can apply to many specific end uses. These range from low and medium carbon steels, through high-carbon steels, aluminum alloys, alloy steels, stainless steels, nickel alloys, tool steels and titanium alloys. The precise alloy for the intended end use should always be specified and stated in the purchasing process according to final mechanical property requirements and service conditions.

Material properties can also be altered for specific end uses by hot working as well as by using various chemistries, temperatures, heat treatment times, and cooling methods. This facilitates the production of seamless rolled rings or forged parts with optimized mechanical properties and structural integrity, before the part moves on to finish machining.

Each metal possesses unique alloy chemical compositions formed during the steel mill process, along with diverse production procedures for generating ingots or billets of different grades and purities tailored for industry specifications. Consequently, the quality of steel mill output is critical.

In the case of All Metals & Forge Group, end use is emphasized from the very beginning in the request for quote (RFQ) process. The company works with its steel mills to purchase the correct starting stock to achieve the specified properties and operating reliability required of every part. In addition, rough machined parts are tested at least three times to prove chemistry, mechanical properties, and soundness before shipping.

According to Klein, there are groups of alloys within each metal material that lend themselves to specific end uses.

High-nickel alloys (I625, I718, I825), for example, are used at high temperatures in such applications as jet engine parts, nuclear power generation, and heat-treated fixtures where high oxidation resistance is required. Other alloys within this group find use in the pulp and paper or oil and gas industries where corrosive conditions may be severe.

The Inconel 600 and 700 series were developed for specific end uses. Inconel 600 resists chloride-ion stress corrosion cracking. Inconel 690 resists sulfur-bearing gases. Inconel 718 is a precipitation-hardening alloy designed to give very high yield, ultimate tensile strengths, and resistance to creep rupture at temperatures up to 1300°F (705°C).

End use is equally important with stainless steels, where the various groups of martensitic (hardenable), ferritic, and austenitic cover a very wide range of properties and applications when resistance to corrosion and heat are critical.

Basic type 410 martensitic grade stainless, with around 13% chromium, is sufficient for mild corrosive conditions, whereas the ferritic type 430, with 17% chromium shows resistance to more severe environments. The performance of the austenitic stainless steels, based on the 18% chromium/10% nickel in type 304 is selected for certain end uses when correctly heat treated and not subject to carbide precipitation. The various additions to the base 304, such as molybdenum, improve resistance to pitting corrosion. The resultant molybdenum-containing grades are types 316 and 317, normally supplied in the low-carbon versions, 316L and 317L.

The range of stainless steels continues through types 329 and 2205 duplex alloys – austenite and ferrite – that provide good resistance to pitting and stress corrosion cracking, to precipitation

hardening grades such as 13-8Mo, 15-5PH, 15-7Mo and 17-4PH. These latter grades reach high yield and ultimate tensile strengths from a single, low-temperature heat treatment following a solution anneal. This makes these types of stainless steels suitable for challenging applications such as oil field valve parts, chemical process equipment, forged aircraft fittings, nuclear reactor parts, and jet engine components.

With so many options available, a thorough grasp of the end use is vital for establishing the correct material, dimensions, and properties needed during forging to guarantee peak performance in the eventual application.

By collaborating with an experienced seamless rolled ring manufacturer that can tailor the forging process to the specific end use, OEMs can ensure their final product meets all the necessary requirements and industry standards for their specific application.

For more information, contact All Metals & Forge Group, LLC at 75 Lane Road, NJ 07004; (973) 276-5000; Canada 416-363-2244, toll-free (800) 600-9290; fax (973) 276-5050 or visit ***www.steelforge.com*** •

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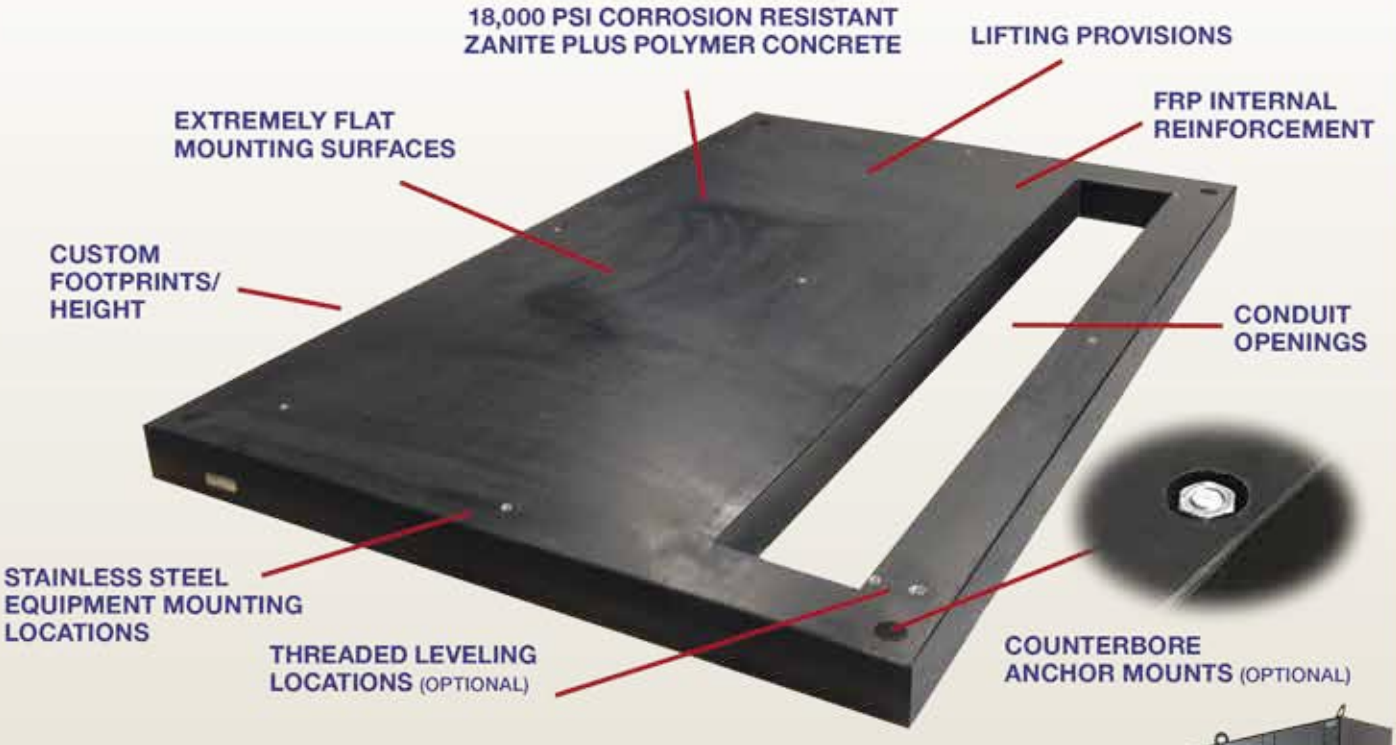

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