WELDING JOURNAL

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FABTECH

ORLANDO 2024 PREVIEW

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Advertising

Senior Sales Executive Scott Beller
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Subscriptions

Subscriptions Representative Giovanni Valdes
gvaldes@aws.org

aws.org

8669 NW 36 St., # 130, Miami, FL 33166-6672
(305) 443-9353 or (800) 443-9353

AWS Mission Statement

The mission of the American Welding Society is to advance the science, technology, and application of welding and allied joining processes worldwide, including brazing, soldering, and thermal spraying.

AWS Promotes Diversity

AWS values diversity, advocates equitable and inclusive practices, and engages its members and stakeholders in establishing a culture in the welding community that welcomes, learns from, and celebrates differences among people. AWS recognizes that a commitment to diversity, equity, and inclusion is essential to achieving excellence for the Association, its members, and employees.

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FABTECH Makes Its Orlando Debut



Robert Roth
AWS interim executive director and CEO

Whether you are in welding management, sales, engineering, or production, you should schedule time to attend FABTECH 2024 from October 15 to 17 in Orlando, Fla. Orlando is a new city for FABTECH. The city and convention bureau have been welcoming and working hard to accommodate our needs. Everyone wants FABTECH 2024 to be the best ever. The FABTECH team has sold out the show, the exhibitors are bringing their latest technology, and the experts can help you determine the best products for your application. All that's left to make the show a success is your attendance. AWS has partnered with the Fabricators and Manufacturers Association (FMA), SME, the Precision Metalforming Association (PMA), and the Chemical Coaters Association International (CCAI) to create the largest metal fabricating show in North America. It brings together in one place the latest technology in welding, metal fabricating, metal forming, and finishing equipment. Additionally, there will be conferences, keynotes, and panel discussions where ideas and insights to improve your business's competitiveness and quality are shared.

The Orange County Convention Center in Orlando provides over 700,000 sq ft of exhibit space with welding equipment and products spanning 172,000 sq ft, of which 52,000 sq ft will specifically spotlight automation. As a testament to its power in driving manufacturing forward, the show is expected to attract about 35,000 visitors.

North American manufacturers, constructors, and fabricators are poised to benefit from a surge in North American production. During the pandemic, we discovered how fragile our globalized supply chains had become. The true cost of cheap products sourced half a world away was revealed. There is a fair amount of evidence that we are transitioning from a global economy to a regional economy. North America is poised to be a significant beneficiary of this transition, and the continent's high-quality products, speed to market, skilled talent, flexibility, and minimized transportation risk will position your company for success. We want to be a partner in your success, and the FABTECH show will bring together the technology and knowledge you can apply to your business.

FABTECH 2024 will offer up-front, hands-on demonstrations of new and innovative equipment. There will be many opportunities for networking, learning from industry experts, and gaining valuable know-how. The show's targeted technical, operational, economic, and management sessions will give you the necessary answers to increase both productivity and profits. Additionally, FABTECH will offer more than 225 education sessions. For example, AWS will present a comprehensive lineup of welding education sessions led by industry professionals, with programs focusing on best practices and new commercial developments in welding. With more than 100 years of experience serving the welding community, AWS is a reliable source for a wide range of educational tools. There are online learning products, the fundamentals of welding curriculum, and customizable in-person or virtual training solutions for corporate and academic markets. You can also purchase AWS codes and standards, reference books, and other publications. Visit a sales associate to explore the answer to your company's needs at AWS booth numbers W4481, W4685, and W4689.

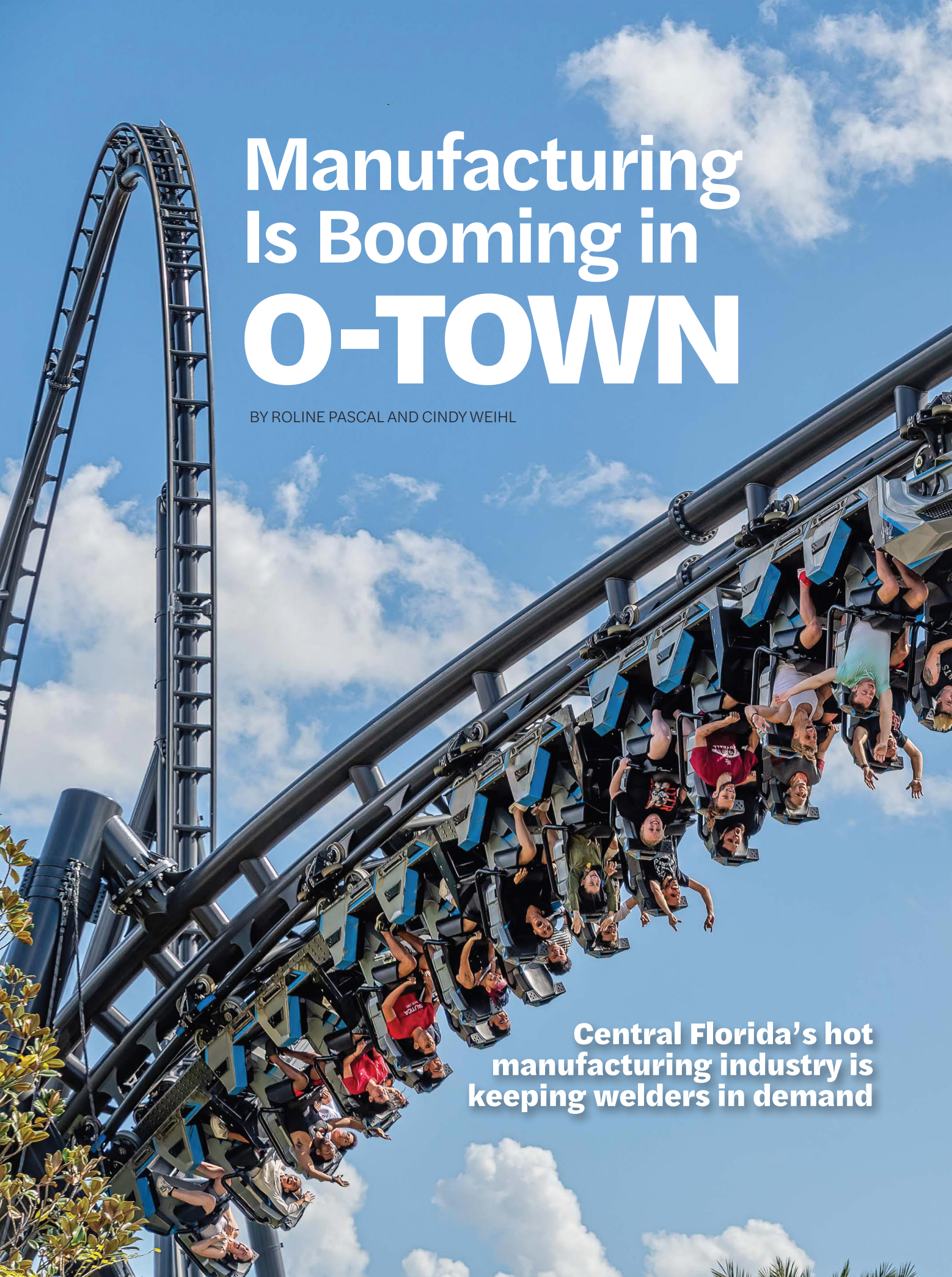
The FABx Tech Talks will feature a powerful lineup of visionary leaders driving manufacturing forward. These presentations are organized as keynotes and panel discussions. The topics include the state of the industry, attraction and retention of next-generation talent, women leaders in fabrication, and advanced manufacturing. On Wednesday, October 16, in the FABTECH Theater, NFL Hall of Fame Quarterback Steve Young will give a presentation on performance under pressure that is sure to inspire.

I am honored to lead AWS as its interim executive director. I am proud to serve with the talented team that makes FABTECH happen, and I look forward to greeting you in Orlando at the show this year. WJ

"The FABTECH team has sold out the show, the exhibitors are bringing their latest technology, and the experts can help you determine the best products for your application. All that's left to make the show a success is your attendance."

Manufacturing Is Booming in O-TOWN

BY ROLINE PASCAL AND CINDY WEIHL



Central Florida's hot manufacturing industry is keeping welders in demand



The Jurassic World VelociCoaster at Universal Islands of Adventure.

Mention Orlando, Fla., and minds will conjure images of thrilling amusement parks. After all, the city is a leading tourism destination and is considered the world's theme park capital, with Walt Disney World®, Universal Orlando®, and SeaWorld® calling it home. However, theme parks and tourism only scratch the surface of what's happening in the area. Most visitors are probably unaware that manufacturing is booming in the Orlando region. Central Florida is quickly becoming a national and global center for manufacturing, passing both Georgia and New York to become the tenth-largest state in the country for manufacturing employment (Ref. 1), which means lots of work for welders. It also makes Orlando the ideal host for the 2024 FABTECH show.

This October 15–17, Orlando will welcome thousands of attendees to the annual FABTECH show, North America's largest metal forming, fabricating, welding, and finishing event, which will take place at the Orange County Convention Center for the first time in the show's history (the show is typically held in Chicago, Ill., on odd years and alternates between Atlanta, Ga., and Las Vegas, Nev., on even years). It's an exciting opportunity for visitors to see what the Orlando industry has to offer and for local manufacturers, fabricators, and engineers to see the latest technology available.

Welding Makes Magic in the Amusement and Theme Park Industry

According to Visit Orlando, the official tourism association for Orlando, the city welcomed 74 million visitors in 2022, making it the number one U.S. travel destination (Ref. 2). The main reason visitors come is theme parks. That industry is one of the main drivers of manufacturing growth in Orlando and one that keeps welders busy.

From twists and turns, loop structures, corkscrews, and inversions to elaborate track layouts and supports, welding is at the heart of bringing to life the imaginative ride concepts and intricate designs of roller coasters and other attractions, and skilled welders are being called on to assemble the frameworks, support structures, and track systems of these rides, ensuring strong and secure joints that can withstand high speeds and extreme conditions.

Ironworkers Create Epic Thrills

Universal Epic Universe is a new and highly anticipated theme park scheduled to open in Orlando in 2025. The 750-acre park will offer visitors more than 50 attractions, entertainment, shopping, and dining spots in five themed



Fig. 1 — (top) Ironworkers Union Local 808 has been building the Stardust Racers, one of the roller coasters that will debut at Universal Epic Universe in 2025. The dueling coaster will reach speeds of 62 mph and heights of up to 133 ft on a 5000-ft steel track. (Photo courtesy of Ironworkers Union Local 808.)

Fig. 2 — (bottom) An overview of the construction at Universal Epic Universe.



Fig. 3 — Ironworkers 808 members work on Mobile Launcher 2, a new ground structure that will be used to support the Space Launch System rocket at the Kennedy Space Center. (Photo courtesy of Bechtel.)

worlds: The Wizarding World of Harry Potter™ – Ministry of Magic™, SUPER NINTENDO WORLD™, How to Train Your Dragon – Isle of Berk, Dark Universe, and Celestial Park.

Universal outsourced Ironworkers Union Local 808 as its primary third-party construction and maintenance firm to build the theme park — Figs. 1, 2. Local 808 employs or contracts skilled craftspeople to create the custom structures seen in Central Florida's space center and theme parks.

"You name it, we've done it, and we're building the new Universal Epic Universe," said Richard Watford Jr., training director and apprentice coordinator at Ironworkers Union Local 808. "Right now, we have seven or eight contractors out there, about 300 guys, and have been there for over two years."

The organization has built most of Universal Islands of Adventure,Disney's Hollywood Studios, LEGOLAND®, and SeaWorld® Orlando. In addition to their current theme park work at Epic Universe, the ironworkers are also rehabilitating EPCOT's Test Track coaster.

With nearly 1000 members, the ironworkers do a lot of specialty welding on aluminum, bronze, copper, and stainless dissimilar metals. They also reinforce foundations and concrete structures, install support buildings, and set stairs and handrails, fences, glasswork, structural and ornamental iron, precast structures, space frames, and parking decks.

Welding Repair Wizardry

Some theme parks, such as Disney World®, have an in-house maintenance and construction facility. Disney's in-house construction organization, Buena Vista Construction Co. (BVCC), performs work exclusively at the Disney theme parks and resorts.



Fig. 4 — Jason Becker (right) teaches gas metal arc welding to a student at UnderGround Metal Works.

Maintaining the safety and functionality of amusement park rides is an ongoing effort, and the ironworkers also play a significant role in this process. Because Orlando theme parks have no off-season, most work is done at night.

BVCC runs a night and day shift year-round for Disney. The night shift does in-the-park maintenance when there are no guests. The day shift does prefabrication and installation behind the scenes while guests are in the park, with the occasional shutdown when they have to reservice.

"They'll have to shut it down, and they'll be working inside the park behind the construction wall during the days," added Watford. "Usually, they try to do that stuff at night when no one is there. They'll do the behind-the-scenes work during the days, everything from repair and maintenance to replacements of corroded handrails and old rusty stuff, and they typically do replacements at night, from repairing gate hinges to building little bus stands and parking bollards and anything you could think of."

Welders have been in high demand, and the supply has been strong.

"I definitely see the desire, the want, the need growing. I find a lot of candidates, a lot more than ever before, coming to me, wanting to be welders," said Watford.

Central Florida's Aviation and Aerospace Industries Are Soaring

Outside of theme parks, two other industries keeping welders and tradespeople busy in Central Florida are aviation and aerospace — Fig. 3. Florida is sometimes referred to as the gateway to space, and Orlando is at the center of a large number of aerospace and defense companies and just an hour west of the Kennedy Space Center, one of ten NASA field centers, and a premier multiuser spaceport with more than 90 private-sector partners and nearly 250 partnership agreements.

According to the *2023 Florida Manufacturing* report (Ref. 1), aerospace manufacturing has been the fastest-growing segment of Florida's manufacturing industry in recent years. As home to the Kennedy Space Center™ and Cape Canaveral Space Force Station, the Florida Space Coast heavily focuses on aerospace research and development.

More than 17,144 aerospace-related companies call Florida home, contributing $19 billion in revenues to Florida's economy (Ref. 1).

This fall, Boeing will operate a new engineering facility within the Cici & Hyatt Brown Center for Aerospace Technology at Embry-Riddle Aeronautical University in Daytona Beach. French aviation company Aura Aero will also open a facility at Embry-Riddle to deliver hybrid electric regional aircraft to U.S. customers.

Semiconductors, Infrastructure, and Commercial Manufacturing Keep Welders in Demand

The manufacturing and fabrication growth in Central Florida isn't expected to slow down soon.

Earlier this year, a group of Central Florida organizations received a multimillion-dollar grant from the National Science Foundation to develop the semiconductor corridor known as NeoCity®. Semiconductors are key in creating smart technology in phones, computers, and vehicles.

Florida Governor Ron DeSantis has also proposed an investment of $80 million for the University of Florida's Florida Semiconductor Institute in the 2024 legislative session. The allocation would build on the success of previous investments, including a $35-million grant for educational institutions through the Florida Department of Education's Workforce Capitalization Incentive Grant Program and the $28 million invested in key institutions like NeoCity, Valencia College, Santa Fe College, Eastern Florida State College, and Lake Technical College.

A plethora of infrastructure projects also promises to keep skilled workers busy. It's estimated that constructing Epic Universe will cost $1 billion. Additionally, Disney has recently announced it will invest $17 billion into its Florida properties and a potential fifth major theme park over the next ten to 20 years, with at least $8 billion in capital investment in the first ten years.

With tourists flocking to amusement and theme parks throughout the Orlando region, hotels, restaurants, shopping centers, and entertainment complexes are always in high demand. This spring, Orlando approved a $500-million mixed-use project named Westcourt Orlando. The development will be next to the Kia Center, home of the NBA's Orlando Magic, and feature high-rise residences, a full-service hotel, office and meeting spaces, retail shops, and a live events venue. The project will break ground in late 2024 with an expected completion date of spring 2027.

Training the Much-Needed Workforce

Central Florida's infrastructure boom has exponentially increased the demand for skilled welders. Florida's welding workforce is rising to meet these challenges.

"People don't think of manufacturing when you think Florida, but there's all these little industrial areas where it's just packed full of manufacturing centers, which made it easy for me as an instructor to go up to a lot of these manufacturing companies and say, 'Hey, I train welders, and you're looking to hire welders,'" said Jason Becker, owner and operator of Orlando-based UnderGround Metal Works and Weldworks Training Center and host of the *Arc Junkies* podcast. "'Let's work together and make sure that whatever you're looking for in a potential employee is being taught in my class.' That way, I can develop a pipeline because, at the end of the day, my goal is to train my students well enough to be hired and place them in the industry. The company's goal is to have good, productive workers to continue to manufacture parts of products and services for Central Florida and nationwide."

Some of Becker's students go on to various industry jobs nationwide, but many choose to stay close to home — Fig. 4.

"A lot stay here locally and mostly do structural and fabrication work. They do theming for the theme parks, movie sets, sound stages, all that stuff," he said.

However, Becker isn't just busy training welders. He also ensures they are properly certified.

"I've been getting a lot of subcontractors reaching out who need to get their employees certified because contractors want to see welder certifications, and that's kind of what prompted me to become an accredited testing facility here because that need for that demand wasn't being fulfilled," he said.

Ironworkers Local 808 currently has 100 apprentices in its program. Apprentices learn not just welding but also everything from structural ironwork to blueprint reading to rigging and machinery.

The four-year apprenticeship combines classroom knowledge and work experience to produce successful journeymen who can support the growing fabrication industry in Central Florida.

Conclusion

Whether Orlando's welders are building the latest theme park attraction, fabricating aircrafts to visit the next frontier, or advancing in the semiconductor industry, the city is not only at the forefront of tourism but also paving the way as a manufacturing center. WJ



BY TONY HUFFORD

When choosing grinding and cutting wheels for stainless steel, you should look for products specifically designed to avoid contamination.

TIPS FOR CUTTING & GRINDING Stainless Steel with BONDED ABRASIVES

Three ways to maximize your efficiency are outlined

While not as common as its workhorse cousin, carbon steel, stainless steel offers corrosion-resistant benefits that make it a popular choice for many applications across numerous industries, including construction, shipbuilding, storage, and food and beverage processing.

Stainless steel has a protective coating — a chromium oxide layer across the surface — that grants it good resistance to corrosion, rust, and oxidation. However, this characteristic presents some challenges when properly storing, handling, and working with stainless steel.

Learning to avoid common mistakes when cutting and grinding stainless steel using bonded abrasive products helps ensure successful results when working with the material.

What Makes Stainless Steel Different?

Stainless steel and carbon steel have the same basic composition of iron and carbon, but stainless steel has a higher chromium content as its alloying element, which helps provide the protective layer. When working with stainless steel,

one of the most critical challenges is avoiding contamination or damage to that oxide layer.

In addition, stainless steel is a high-value material compared to basic carbon steel. It costs more to produce and purchase, so any mistakes that cause rework or scrap of parts and material can be especially costly for an operation. Not only are the damaged or scrapped parts costly, but so is the added labor time for any rework. Companies often have their most skilled operators working on high-value parts, like those made from stainless steel, which can increase the labor costs of rework.

Often, an operator can feel like they're doing less work when cutting or grinding stainless steel vs. carbon steel. This may cause them to change their cutting or grinding style or apply more pressure, which is a big no-no. Here are some tips for maximizing efficiency and eliminating contamination when cutting and grinding stainless steel.

TIP 1: Choose Products Designed for Stainless Steel

A key factor is ensuring that the correct product is being used. When using bonded abrasives like grinding and cutting wheels on stainless steel, look for products designed to avoid contamination. These contaminant-free products, typically labeled INOX, contain little to no iron, sulfur, and chlorine, resulting in a worry-free solution for stainless steel applications. Many general-purpose abrasive products contain iron, and using these products on stainless steel can leave residue that results in after-rust.

While contaminant-free products labeled as INOX can also be used to cut or grind carbon steel, a wheel that has been used on steel should never be used on stainless steel because it can cause cross-contamination.

TIP 2: Use Proper Storage and Handling

Companies that work with stainless steel face several challenges to eliminating the chance of cross-contamination. The following are some typical occurrences that can happen to even the most experienced workers.

Cross-contamination commonly occurs when the wrong abrasive product is used on stainless steel or when a stainless steel wheel that has already been used on carbon steel is used on stainless. However, contamination can also happen through improper storage and handling practices.

Storage and handling are more important than you think. For example, don't store stainless steel and carbon steel in the same bin or place stainless steel material on a carbon steel shelf, as this can cause it to pick up contaminants. To avoid this, many companies place a piece of wood or some noncontaminating barrier between a carbon steel shelf and stainless steel parts or materials.

Some large end-users build physical barriers between steel and stainless/aluminum production and keep operations in separate bays or cells as an added step to prevent cross-contamination.

Because cross-contamination can occur in multiple ways, it's important to take steps to safeguard against all possible contamination sources.

TIP 3: Be Careful with Heat

Stainless steel is typically more labor intensive to grind, especially when using the wrong abrasive. Operators may grind with more force or dwell too long in spots. As a result, more heat is produced, which is the nemesis when working with stainless steel. Too much heat or dwelling in the same area too long can cause discoloration on the material surface, leading to rework or even product scrap.

Again, choosing high-performance products designed for stainless steel will help reduce the labor involved with grinding the material. Abrasives that are contaminant-free and use ceramic grains are a great choice. They self-sharpen and maintain a consistent cut rate throughout their life, which allows the operator to achieve the desired results without heavy pressure. In addition, using proper technique can help reduce heat buildup. Be sure to use constant, fluid movements and longer strokes when working with stainless steel and avoid dwelling in one spot. It's also important to avoid using too much pressure with stainless steel. When operators have to press hard to get the performance they want from a product, they are likely using the wrong product.

Learning to avoid common mistakes when cutting and grinding stainless steel using bonded abrasive products helps ensure successful results when working with the material.



When an operator is working with stainless steel, one of the most critical challenges is avoiding contamination or damage to the oxide layer. Choosing the appropriate cutting and grinding products for stainless steel is a key first step.



Heat is the nemesis when working with stainless steel. Too much heat or dwelling in the same area too long can cause discoloration. Abrasives that are contaminant-free and use ceramic grains self sharpen and maintain a consistent cut rate throughout their life.

Products Available for Stainless Steel

All the same basic styles of abrasive products used for cutting and grinding carbon steel are also available for stainless steel. As previously mentioned, products specifically designed for INOX and/or that contain ceramic grains are the best options for most stainless applications.

The self-sharpening crystals of ceramic grains in those products allow operators to use lighter or medium pressure, which helps prevent heat discoloration and allows them to cut through the material more easily.

Aluminum oxide is also a good general-purpose grain that is available in contaminant-free wheel options. In addition, new technologies are helping to drive advancements in cutting and grinding stainless steel.

Optimizing Results with Stainless Steel

When working with stainless steel, never cut corners when selecting or storing abrasives. Because stainless steel offers specific characteristics, it is often used on high-value parts, and mistakes can be costly. Following these tips for abrasive product selection, operator technique, and handling and storage of stainless steel can help operations get better results when cutting and grinding the material. WJ

TONY HUFFORD (*thufford@weilerabrasives.com*) is category manager, metal fabrication, Weiler Abrasives, Cresco, Pa.

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