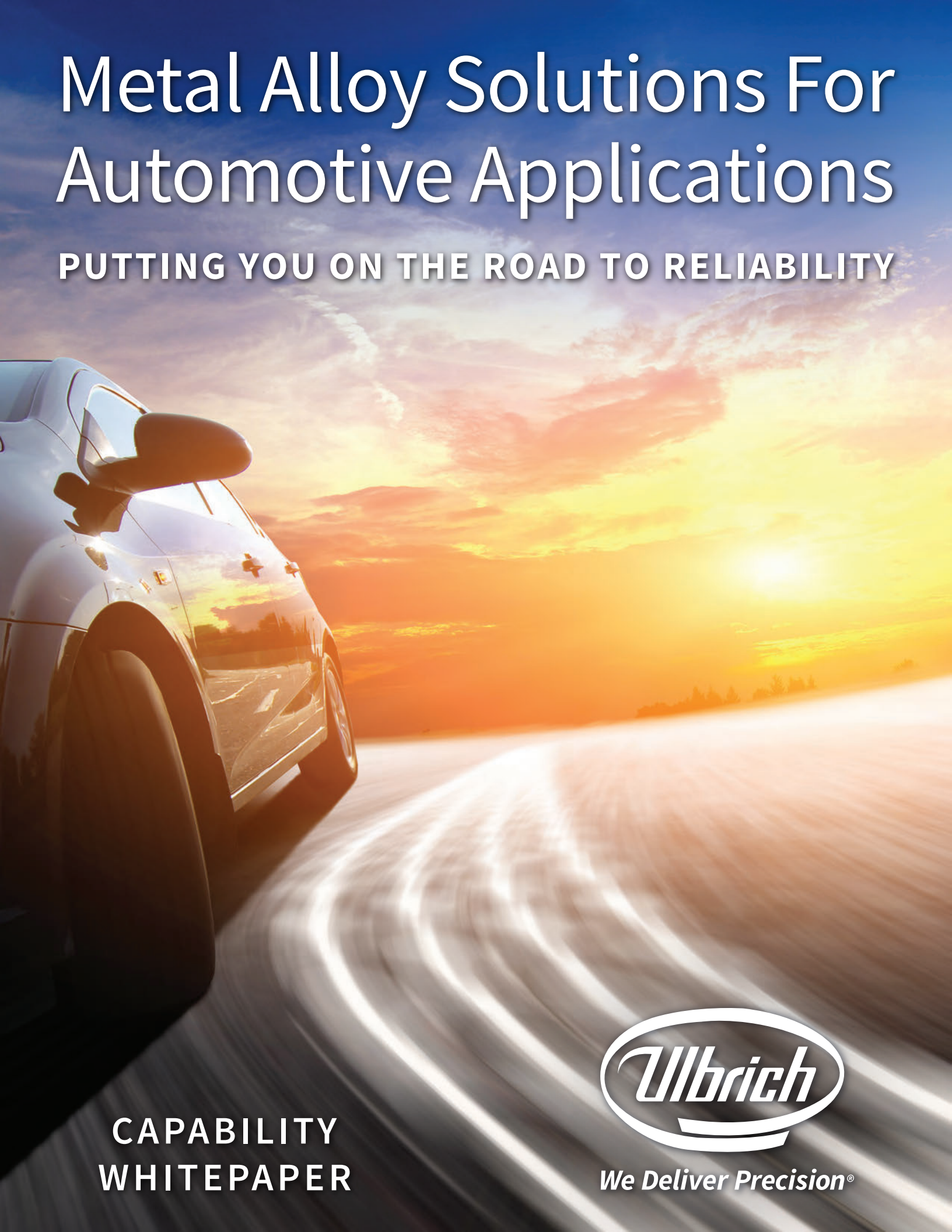
Metal Alloy Solutions For Automotive Applications

PUTTING YOU ON THE ROAD TO RELIABILITY



CAPABILITY WHITEPAPER

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CAPABILITY WHITEPAPER

Steel & Aluminum for Automotive Parts

As technology continues to evolve the automotive industry, so has Ulbrich's dedication to serving the market with material solutions.

Our inventory management system, manufacturing certifications and strong supply chain with mills across the globe allow us to guarantee the highest standards regarding service, quality and on-time delivery to our customers.

20

METALLURGISTS ON STAFF

Access to an unparalleled number of process, product and quality metallurgists, each with expertise that is best suited for your unique raw material needs.

165+

ALLOYS AVAILABLE

Our extensive inventory across multiple product lines allows Ulbrich to supply the highest quality material for your specific requirements.

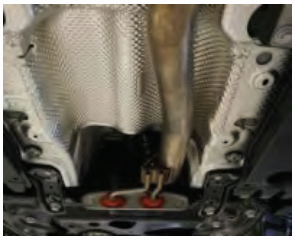
100+

YEARS OF EXPERIENCE

Since 1924, Ulbrich has been a pioneer in the metals industry thanks to a never-ending commitment to quality, innovation and world-class customer service.

AUTOMOTIVE APPLICATIONS BENEFITTING FROM ULBRICH PRECISION ROLLED METALS

Heat Shields



Automotive Bellows

Clamps

Exhaust Systems

Trim & Emblems

Flexible Metal Hoses

Engine Parts & Safety Systems

Stamped Parts

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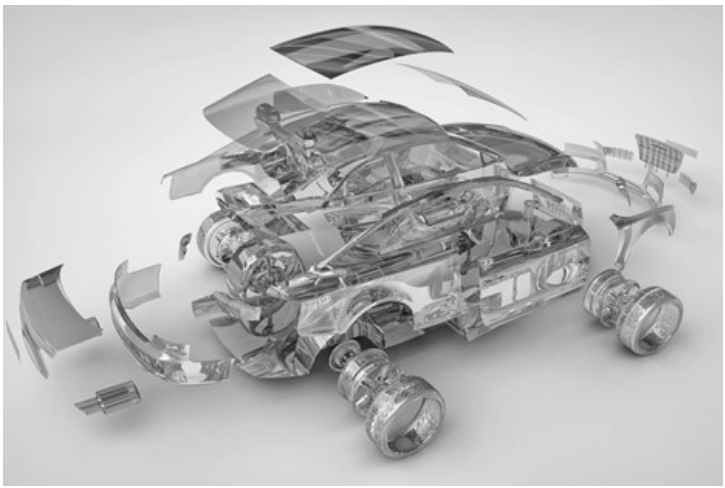
Ideal Materials for Lighter, Stronger and Safer Automotive Applications

FEATURED ON INDUSTRYNET THE INDUSTRIAL MARKETPLACE

Parts manufactured by stampers and fabricators used to produce airbag systems, automotive engine components, and sensors are made from a variety of alloys that can withstand demanding conditions such as heat, stress & environmental factors. Applications like these are inheriting demands as a result of innovation. Automotive engineers are pushing the envelope for lighter weight, better performance, increasing electrical properties and greater durability for cars. These demands put increasing pressure on the alloys selected and open the door to new alternatives being required to meet the needs of the end use.

Auto part manufacturers are also being charged with focusing on components that allow vehicles to use fuel more efficiently, improve safety, avoid noise and vibration, as well as comply with environmental regulations, which have become increasingly strict. In addition, as manufacturers are crafting a nd r olling o ut t heir e lectrification strategies, the need for lighter weight and higher strength materials are at the forefront.

With this trend of looking for lighter cars, it is necessary to use suitable materials that benefit the cost and production time. For this reason, vehicle manufacturers are in constant search of new alloys which are of the utmost quality and precision for their models. Car lightening is the best way forward and the biggest manufacturing trend for years to come. Fortunately, there are several alloys in the commercial mainstream that have proven themselves in these critical applications. This article will specifically look at the 2 biggest alloys in the automotive industry: stainless steel and aluminum.



STAINLESS STEEL BENEFITS

Stainless steel is resistant to corrosion and oxidation, which allows it to withstand extreme temperatures. This material provides security, can undergo extensive use for long periods of time, has an aesthetically pleasing finish, and does not require continuous maintenance. From its use in light vehicle accessories, to its use in the structure of heavy vehicles, these properties make stainless steel a fundamental material in the automotive industry. Common automotive applications of stainless steel include brackets, springs, exhaust systems, pipes, wheel rims, dash trim, catalytic converters, and much more.

Steel offers many characteristics that make it a predominant material in the auto industry. Its mechanical properties offer great resistance to corrosion and ductility, in addition to its low cost in relation to other alloys or metals. Because of its benefits, steel is preferred by manufacturers. Its advantages include excellent resistance to shocks, minimal maintenance processes, ability to withstand extreme temperatures, attractive design for users since its shape is easy to modify, a long service life, and much more.

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The dynamic energy of the impact is absorbed during an accident. The better the mechanical properties of the material, the more energy it is able to absorb. With stainless steel, the quicker the load is applied, the harder it is for it to give in to deformation. A well-designed system that contains stainless steel in its structural parts has the ability to deform progressively, but in a controlled and predetermined way that offers better protection to users. It functions like a sponge, absorbing all possible damage in order to protect passengers. Stainless steel offers the highest energy absorption capacity in relation to the deformation rate.

Many applications require fasteners that can endure elevated temperatures, atmospheric or chemical corrosion, or both. Products like bolts, nuts, washers, and rivets are made of special metals that can tolerate intense heat, stress and corrosive environments. These applications are becoming more popular as designers push for improved performance and greater durability under challenging conditions. Most alloys used in fasteners are precipitation hardening alloys. These PH alloys are different from other grades of stainless and nickel-based alloys due to small additions of aluminum, copper, phosphorous or titanium in their matrix. Although they have more complex metallurgy, PH alloys are not necessarily more costly than many non-age-hardenable alloys. In fact, performance may be substantially higher in PH alloys without the cost.

ADVANTAGES OF ALUMINUM

Another dominant material in the auto industry is aluminum. Aluminum is regarded as a growing market today; however, it has been a key material for automakers for several decades. Aluminum is strong & light, combines with other materials easily, and is both heat and corrosion resistant. Every kg of aluminum used in a car reduces the total weight of the vehicle by 1 kg. This is especially important given the increasing relevance of fuel efficiency and achieving a reduction in CO2 emissions. This is one of the many reasons that aluminum is becoming increasingly pertinent as the ideal material in manufacturing vehicles and their components.

In the auto industry, lightweight represents the requirement that all parts of a car be optimized sufficiently to achieve the lowest possible weight. Lighter cars mean better fuel economy which is one of the most considered qualities when consumers are faced with choosing a new vehicle. There are strict regulations that have transformed automotive requirements.. Across the globe, manufacturers must now work to reduce their CO2 emissions while also lowering production costs. Now more than ever, it's necessary to look for more innovative processes that allow for increased production and reduced fuel use, all while meeting constantly growing demands. The benefits to lightweight vehicles include better acceleration, breaking and overall handling, milage, as well as the development of state-of-the-art biocomposites and biomaterials to seek a lighter alloy in bodies, and much more.

The easiest way to achieve a lightweight automobile is with aluminum. It is a strong and light material, resistant to heat & corrosion, and easy to combine with other materials. All these characteristics make car manufacturers take them into account for the manufacture of different elements of the vehicle body such as: bumpers, chests, doors, etc. Products made of this alloy, including sheets, coils, plates, bars, and tubes, are becoming increasingly popular in the industry. The most used of these alloys are 5000 series aluminum and 600 series aluminum. As the automotive industry moves forward, the trend towards a better environment and a constant quest to use less fossil fuels represents a technological breakthrough, and aluminum will be a key player in this.

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Stainless Steel

ULBRICH ROLLS ALL FIVE CLASSIFICATIONS OF STAINLESS STEEL ALLOYS IN MULTIPLE PRODUCT FORMS FOR OUR CUSTOMERS.

AUSTENITIC

With exceptional resistance to heat and corrosion, unsurpassed strength and formability, these grades are the most common with many positive characteristics driving demand.

- Type 201 UNS S20100
- Type 204Cu UNS S20430
- Type 301 UNS S30100
- Type 301Si UNS S30116
- Type 302 UNS S30200
- Type 302HQ UNS S30430
- Type 303 UNS S30300
- Type 303Se UNS S30323
- Type 304(V/LV) UNS S30400
- Type 304L UNS S30403
- Type 304Cu UNS S30430
- Type 305 UNS S30500
- Type 309 UNS S30908
- Type 310 UNS S31000
- Type 310S UNS S31008
- Type 316 UNS S31600
- Type 316L UNS S31603
- Type 316LS UNS S31673
- Type 316LVM UNS S31673
- Type 316Ti UNS S31635
- Type 317 UNS S31700
- Type 317L UNS S31703
- Type 321 UNS S32100
- Type 330 UNS N08330
- Type 347 UNS S34700
- Nitronic 30 UNS S20400
- Nitronic 32 UNS S24100
- Nitronic 33 UNS S24000
- Nitronic 40 UNS S21900
- Nitronic 50 UNS S20910
- High Carbon Steel Wire
- AL-6XN® UNS N08367
- 20 CB-3® UNS N08020

MARTENSITIC

Because of its chemical composition, Martensitic steel can be hardened & strengthened through heating & aging treatments, making it stronger than other stainless types. The Martensitic grades cover a wide range of applications, from combating comparatively mild corrosive conditions to creating maximum strength & stiffness for cold formed parts.

- Type 420 UNS S42000
- Type 420LC UNS S42000
- Type 420HC UNS S42000
- Type 440A UNS S44002
- Custom 450 UNS S45000
- Custom 455 UNS S45500
- Type 410 UNS S41000
- Type 416 UNS S41600

FERRITIC

Defined as a straight chromium non-hardenable by heat treatment and only slightly hardenable by cold rolling class of stainless alloys which have chromium ranging from 10.5% to 30% and a carbon level under .20%. Ferritic grades differ from other stainless types in two crucial regards: its chemical composition and its molecular grain structure.

- Type 430 UNS S43000
- Type 430Li UNS S43000
- Type 434 UNS S43400
- Type 436 UNS S43600
- Type 444 UNS S44400

PRECIPITATION HARDENING

PH alloys are similar to other stainless and nickel-based alloys, with one major exception: They contain small additions of copper, aluminum, phosphorus, or titanium. Exhibiting high strength & toughness in service, they are good for parts that are extensively drawn.

- 15-7 MO® UNS S15700
- A286 UNS S66286
- 17-4 PH® UNS S17400
- AM 350® UNS S35000
- 17-7 PH® UNS S17700

DUPLEX GRADES

Containing a two-phase microstructure of ferritic & austenitic, Duplex are known for their stress corrosion cracking resistance, excellent strength, and good toughness & ductility.

- Alloy 2507 UNS S32750
- Alloy 2205 UNS S31803, UNS S32205
- Alloy 2304 UNS S32304

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Aluminum

ULBRICH OFFERS 1000, 2000, 3000, 5000, AND 6000 & 7000 SERIES EACH WITH UNIQUE PROPERTIES SUITABLE FOR VARIOUS PARTS.

1000 SERIES

1000 Series Aluminum has a minimum of 99% aluminum with no major alloying additions. These compositions are characterized as a soft & very ductile material with excellent workability and corrosion resistance, high thermal and electrical conductivity, and low mechanical properties. These alloys are non-heat treatable. This material is well suited for applications that involve severe forming because it work hardens more slowly during the forming process. 1000 Series Aluminum takes extremely well to welding and is the most weldable of all aluminum alloys.

- UNS # A91050 | ALUMINUM 99.50 min
- UNS # A91100 | ALUMINUM 99.00 min
- UNS # A91180 | ALUMINUM 99.80 min
- UNS # A91199 | ALUMINUM 99.99 min
- UNS # A91350 | ALUMINUM 99.50 min

2000 SERIES

2000 Series Aluminum are a set of "hard alloys". The aluminum-copper alloys typically contain between 2 to 10% copper, with smaller additions of other elements. The copper provides substantial increases in strength and facilitates precipitation hardening to strengths comparable to steel. The introduction of copper to aluminum can also reduce ductility and corrosion resistance. The susceptibility to solidification cracking of aluminum copper alloys is increased; consequently, some of these alloys can be the most challenging aluminum alloys to weld. These are some of the highest strength heat treatable aluminum alloys.

- UNS# A92011
- UNS# A92017
- UNS# A92024
- UNS# A92048
- UNS# A92219

3000 SERIES

3000 Series Aluminum are alloyed with manganese. They have higher strength than pure aluminum while maintaining good formability and corrosion resistance. These alloys are not heat treatable and are suitable for anodizing and welding. They also exhibit moderate resistance to chemical and atmospheric agents, and offer higher mechanical properties and better formability than pure aluminium.

- UNS # A93003
- UNS # A93004
- UNS # A93105

5000 SERIES

Magnesium is the principal element of these moderate-to high-strength, non-heat-treatable alloys that are readily weldable and have excellent corrosion resistance.

- UNS # A95005
- UNS # A95050
- UNS # A95052
- UNS # A95056
- UNS # A95083
- UNS # A95154

6000 & 7000 SERIES

Magnesium and silicon are the major alloying elements for 6000 series, moderate strength alloys which are achieved by either heat treating or cold working. 7000 series have the highest strength & fatigue and zinc is the primary alloying addition.

- UNS # A96005
- UNS # A96013
- UNS # A96061
- UNS # A96063
- UNS # A96101
- UNS # A96151
- UNS # A96201
- UNS # A97072
- UNS # A97075

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What to Look For in a Strip Supplier for Automotive Manufacturers

Buying metal such as stainless steel and aluminum to use in the manufacturing of your products is a major purchase. Coil used to stamp parts for automotive applications can cost anywhere from a few thousand to hundreds of thousands of dollars or more! The quality of that material and the company you buy it from can affect t he s uccess o f t hat m aterial f or y our business in a variety of ways.

It should come as no surprise that buying coil is a purchase that you should never take lightly. For many of you, your ability to successfully hit your company's KPIs when buying steel and aluminum from melt mills, service centers, or precision rerollers hinges on a variety of factors from price to quality. There are also many other factors that play a role including tolerance and mechanical properties.

When sourcing stainless steel or aluminum, it's important to understand that some metal suppliers and manufacturers such as reroll mills supply metal to multiple markets, while some prefer to specialize in one or two, whether it's automotive, construction, or aerospace.

It's easy to understate the complexity of metal purchasing but when you look at the landscape of providers you're faced with another tough choice—which of the top service centers or precision metal manufacturers should you source stainless or aluminum strip coil from?

There is a lot of research that you need to do before buying material and a lot of decisions that need to be made. If you leap in without doing your homework, you could overpay, purchase a coil that has quality issues or lacks the appropriate temper, or has sub-optimal corrosion resistance or mechanical properties, etc. Doing your research can help you make educated and informed decisions about the type of metal you buy and its properties.

10 THINGS TO LOOK AT WHEN EVALUATING RAW OR ENGINEERED MATERIAL SUPPLIERS

1) Capability
2) Alloy Selection
3) Compliance
4) Quality Control Measures
5) Inventory Availability
6) On-Time Delivery
7) Supplier Development
8) Low Scrap Rates
9) Customer Satisfaction
10) Financial Stability

Ulbrich's goal with this article is to help you understand the key elements to consider when selecting your supplier of stainless steel or aluminum coil with high corrosion resistance and high malleability, especially for those of you located within the Mexican automotive industry. If you still have questions after reading this article, please contact us, and we'll do our best to answer as completely as we can!

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1) CAPABILITY

The first thing to look at is capability. Is this service center or reroll mill able to produce the material I need, to the specification I'm working with? Are they able to slit material to the widths that you need with the skived edge you require? Capability is paramount because if they don't have the capability to produce or supply the material how you need it, there is no relationship to be made.

Autopart manufacturers in North America have varying needs in regard to the capability their suppliers need to have in order to execute successfully. There is a wide range across manufacturers regarding the level of precision, their alloy processing capabilities, and their means to deliver on thickness, width, tolerance, mechanical property and temper requirements.

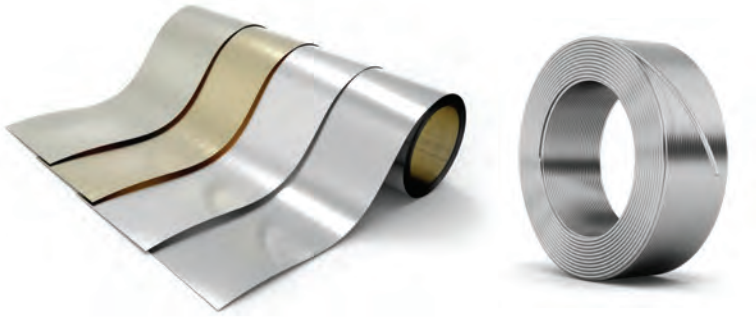
Do your research and look closely at the supplier's website and industry directory profiles to get an understanding of their capabilities. Then, reach out to the best candidate(s) for more information.

When working through the initial quote process with a metal manufacturer you should be sure to include as many details as possible about the specification and provide as many specific details about your request as possible including estimated annual usage. This will help the service center self-identify whether your request is something they're able to provide.

2) ALLOY SELECTION

Today, auto engineers and designers are tasked with developing cars that are lighter in weight, have better performance, increased electrical properties & greater durability for safety. These demands put increasing pressure on the alloys selected and open the door to new alternatives being required to meet the needs of the end use. Automotive part manufacturers like yours are also advancing its components to allow vehicles to use fuel more efficiently. Alternatively, as EV strategies evolve, manufacturers also need to find lighter weight & higher strength materials.

With this trend of producing lighter cars, it is necessary to use suitable materials, which not only benefit the cost but also production time. Because of this, vehicle manufacturers are in constant search of new alloys which are of the utmost quality and precision for their models. Mainly, looking for them to be attractive to their customers and to allow them to improve the safety they can offer in each car, avoiding noise, vibration and reducing fuel consumption, in addition to complying to the letter with increasingly strict environmental regulations.



Fortunately, there are several alloys that make the grade for these requirements. At Ulbrich, buyers can obtain just-in-time deliveries when specified and select from generous inventories covering more than 165 grades of stainless steel, aluminum, nickel, cobalt, and titanium alloys in a range of thicknesses, shapes, sizes & tempers. They include foil and strip in a variety of gauges, as well as wire, round bar, centerless ground bar, hex bar, rod, sheet and plate.

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3) COMPLIANCE

Compliance can be a crucial factor for manufacturers supplying parts to the auto industry. You need to ensure that the supplier or rolling mill partner you are buying material from has the necessary certifications to satisfy your compliance requirements. In the auto industry, there are a few major certs that you might require your supply chain partners to have in order to give them business on a particular part.

IATF 16949

These standard certs include IATF 16949, which affects the vehicle manufacturing process and the supply chains that provide materials to auto manufacturers. The primary objectives of this regulation are to prevent waste in the supply and assembly process, avoid manufacturing defects, improve the quality of manufacturing processes and increase the safety and reliability of vehicles. The International Automotive Task Force developed this regulation to coordinate the quality standards of different countries.

If your organization is IATF 16949 recognized, it would be preferable for you to source materials from a metal service center or precision reroll mill that is also IATF 16949 compliant. Ulbrinox, a division of Ulbrich located in the heart of the Mexican auto industry, has this certification and has supplied stainless steel and aluminum to countless automotive manufacturing partners. IATF certified (or in process) is a requirement for many of the top contract auto manufacturers supplying parts into the major OEMs.

ULBRINOX IS THE TIER 1 AND 2 SUPPLIER OF STAINLESS STEEL WITH HIGH MALLEABILITY AND CORROSION RESISTANCE PLUS HIGH RESISTANCE ALUMINUM IDEAL FOR THE FORMABILITY OF VARIOUS APPLICATIONS IN THE MEXICAN AUTO INDUSTRY.

ISO 9001:2015

Another commonly required certification is ISO 9001:2015. ISO 9000 is a comprehensive set of standards that provides goals to help various businesses improve their practices. Several Ulbrich facilities around the world including Ulbrinox have ISO 9001 certification. The ISO 9000 family of standards includes seven quality management principles: leadership, customer focus, engagement of people, improvement, process approach, evidence-based decision-making, and relationship management. The ISO 9001:2015 certification shows that a company complies with the ISO 19000 family of standards in their practices. It can demonstrate that a business is committed to excellence and improvement in its customer relationships.

ISO 14001

A certification that has come into increasing focus and importance in recent decades has been ISO 14001. The ISO 14001 certification is an important certification for some auto part manufacturers that is looked for as it shows a company's dedication to environmental responsibility. It's based on a business's compliance with the ISO 14000 series of standards. The ISO 14001 shows that a firm is working to reduce their negative environmental impact in all their processes and can help companies build a more positive relationship with their customers and avoid environmental sanctions. At Ulbrich, we strive to meet the main requirements of this standard, even at locations who are not officially 14001 accredited.

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4) QUALITY CONTROL MEASURES

Quality, reliability & innovation are the driving forces that not only make up the DNA of Ulbrich and Ulbrinox, but describe the responsibility of every manufacturer that comprises the supply chain for automotive stainless and aluminum.

In order to know that you are working with the right supplier and maintain a seamless supply chain, you need to work with a service center or reroller with highly advanced quality control. Working with a partner who provides support from metallurgical experts for technical insight who can help your team anticipate and avoid problems that arise during the development of new projects is key to ensuring speed to market. In addition, a team of technical experts play big roles in providing unparalleled quality control.

Wavy or scratched material is unworkable. Coil used for automotive applications needs to be flat, with the right surface finish, temper, and edge condition. When surveying vendors, ask about their capabilities for achieving flatness and consistency in material, and about how their metal can provide for uniformity within your finished products.

Quality control is extremely important to your business & your ability to keep your machines running material. Your supply chain partner and your organization should both be obsessed with reducing scrap, eliminating material defects, and ensuring quality. This starts at sourcing and extends through the processing and shipment of materials to your loading dock. For example, Ulbrinox shares Ulbrich's commitment to quality which means delivering precision tolerances for our customers demanding specifications to keep scrap attributed to poor material quality or imperfections low & yields high. Our team pays meticulous attention to detail and utilizes vision assist systems and other industry 4.0 technology to ensure your exact specs are met, every time.

5) INVENTORY AVAILABILITY

Do they have or have access to the material? Seems like a no-brainer question to investigate, and it is. Inventory availability, and consistency of that availability, are key when looking at potential material suppliers. You need to know that they have the metal and that they will be able to source it regularly so that your machines can keep running. In today's metal landscape, oftentimes that is easier said than done.

Acquiring metal is tough in this climate and it takes your service center partner having deep, long-term relationships with a wide range of suppliers who can provide the material you need. Not every service center or reroll mill has the same buying power as the source of supply. Service centers who have the material you need in stock or have expertise and the relationships in place to acquire that material regularly should float to the top of your list when identifying supply chain partners.

6) ON-TIME DELIVERY

Few things can sour your buying experience than delays in receiving your metal. Finding a supplier with an IATF certification ensures that your auto manufacturing jobs deliver on time. Through process control and the efficiency Quality Management Systems, you will be working with a metal service center who is able to meet your objectives for deliveries per year, on-time, as well as deliveries without defects.

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7) SUPPLIER DEVELOPMENT

If you're making exhaust systems, automotive bellows, heat shields, moldings, emblems, trim, clamps, or EV Battery components, you need material to make your product. Whoever is supplying your coil needs to be committed to supplier development and give you metal when you need it. Along similar lines to inventory availability, you need your supply chain partner to be actively involved in developing their own supplier base, building those relationships, and fighting to get the metal you need at all times.

Proactive supplier development reflects an organization that is reliable, dependable, and committed to its customers as well as their role in the supply chain. An important consideration when you go to buy coil to make products that go into vehicles is whether that company is working towards expanding their source of supply. There is a reason Supplier Development is one of the areas audited by the IATF so intensively during their certification process. If you see that in the metal service center you are looking into for your stainless steel or aluminum materials, you can rest assured that they will be obsessed with getting you the metal you need on time with pristine quality.

8) LOW SCRAP RATES

Slit coil suppliers with high scrap rates are something else to investigate as an automotive manufacturer. Elevated scrap can mean that the service center isn't efficiently purchasing the correct master coils, or that they don't have efficient production. Either of these things might result in higher final pricing being passed on to the customer because of the supplier's inability to properly minimize and efficiently manage scrap rates. Having a low scrap percentage matters when selecting a stainless steel or aluminum raw material supplier as it is a good sign of the operation's resource optimization.

9) CUSTOMER SATISFACTION

The automotive industry has changed radically over the course of recent decades. It stopped being a traditional industry, which focused on manufacturing, and migrated to new business models where there are more participants and where technology giants are changing the rules of the game. This shift has also disrupted and transformed expectations placed on suppliers & manufacturers throughout the supply chain.

Meeting those expectations and delivering promises throughout the spectrum of qualities listed throughout this article translates into elevated levels of satisfaction from customers such as yourself. Direct customer service, and person-to-person relationships matter as well, but the overall satisfaction you can expect trickles down from all the other dimensions we have walked you through. If you can find a supplier who treats your project as being as big of a priority to them as it is to you, you know you have hit the mark.

Suppliers who are IATF certified are special in this regard, and it's why so many automotive-focused companies look for it, because it's also a measured KPI for them. IATF 16949 compliant service centers have demonstrated that they care deeply about their customers in the auto market and are able to deliver a high level of customer satisfaction, ensuring their Customer Specific Requirements are met.

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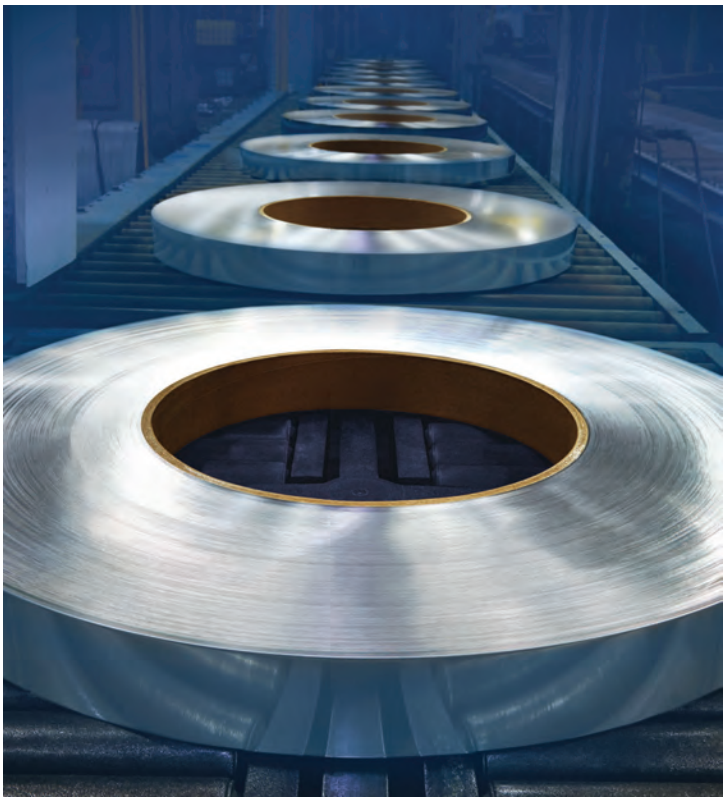
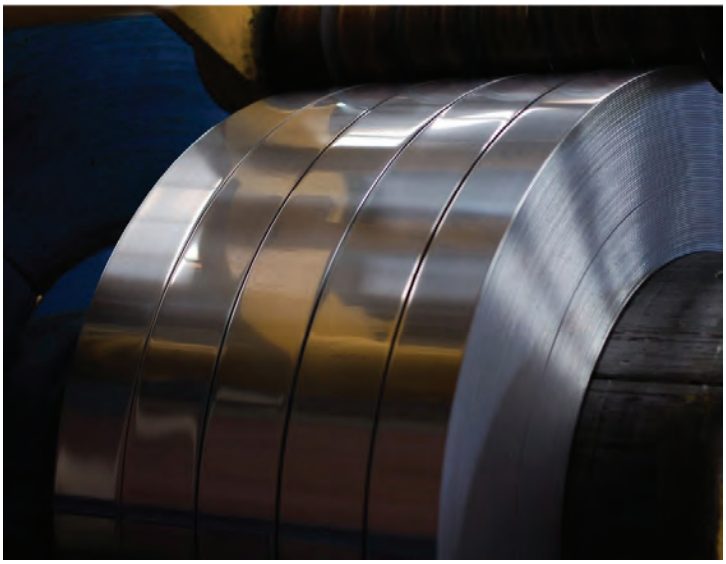
10) FINANCIAL STABILITY

Many of us who have been in the manufacturing world for a while have experienced it — The dreaded day a key supplier calls you up to tell you they're going out of business. It sends us scrambling, and can lead to chaos depending on the state of our own supplier development & diversity. This event can have a major impact on our materials management and production depending on how much that supplier was relied on for their products. That's why it's so important to ensure that any supplier you're working with for your aluminum strip coil or stainless steel, and really any material or part key to your production, are financially stable.

Your business needs the companies that make up its supply base to be stable financially, and avoid any that will be a potential risk for your supply chain in the short or long term. Your operations require partners that will be paying their bills on time, who you can put your trust in. Financial stability, after all, is reflective of the entire business' overall level of responsibility, reliability, organization, and priorities.





Again, buying coil is a purchase that you should never take lightly. For many of you, your ability to successfully hit your company's KPIs when buying steel and aluminum from melt mills, service centers, or precision rerollers hinges on a variety of factors.

Through our division in Mexico, Ulbrinox, we supply the highest quality precision aluminum and stainless steel strip coil to automotive manufacturers throughout North, Central, and South America. Our business is IATF 16949 as well as ISO 9001:2015 certified and committed to providing a best-in-class experience & product to automotive customers regardless of where they may fall within the supply chain. Whether you're an OEM or a contract manufacturer, if you're producing parts for ICE vehicles, or the next generation of EV's & FCV's, we're here for you. Our expert team has seen it all. Ulbrich and their industry leading metallurgical prowess are here to help solve your material challenges of tomorrow, today.

We'd love to hear about the automotive parts you're producing at your manufacturing shop. Engineer to engineer communication is key to a successful partnership in the metal business. If you're in need of stainless steel or aluminum or other specialty metals, contact us and speak to one of our material experts today!

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We Deliver Precision®

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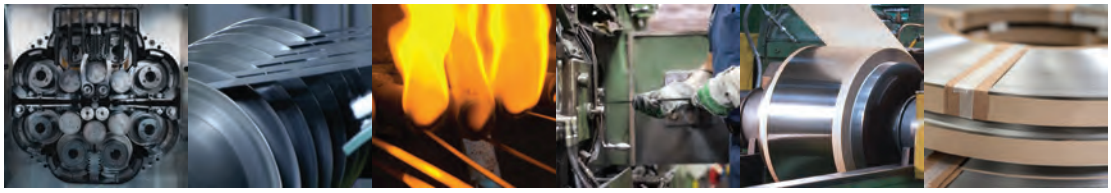
Our Industry Leading Capabilities

TAILORED TO YOUR EXACT SPECIFICATIONS



OVERVIEW OF MANUFACTURING

Our state-of-the-art equipment, technology, and staff make us the go-to stainless steel and special metals producer for numerous manufacturing markets, including the medical, aerospace and automotive industries.

ROLLING TOLERANCES

Our largest H-mill can handle incoming strip material up to .125” thick, while our smallest Z-mill can roll foil as light as .00039″: an order of magnitude thinner than a human hair.

SLITTING & EDGING

From Round to Square edge, our slitters have the ability to separate a wide strip into “mults” or narrower strips to achieve your desired width with as much minimized burr as possible.

ANNEALING

Ulbrich utilizes continous in-line annealing with hydrogen, nitrogen, and argon controlled atmospheres to satisfy the most demanding specs.

MATERIAL PROPERTIES

From Bright to Dull or Quarter Hard to Extra Full Hard, Ulbrich has the ability to control your desired surface finish and mechanical properties.

CUSTOM COATINGS

We expertly apply several peelable Plastisol PVC coatings with various thicknesses, adhesion properties, colors & opacity to protect the surface of the coil during your processing operations. To ensure your product is successfully brought to completion, Ulbrich works with several outside vendors so you don't need to send your coil to a coater and deal with the additional logistics, scrap, and paperwork. Available Adhesive Coatings:

- PTFE , Molykote® which act as a permanent lubricant on steel
- Nitrile Rubber coating for sound dampening and sealing applications
- Adhesives to bond EPDM and TPV to steel
- Coatings for decorative trim applications
- Paints for color coding of steel

PACKAGING

With production and shipping capabilities spanning the entire globe, we are able to accommodate steel and metal product packaging and transit to almost any international destination.

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Strip Coil Rolling & Slitting Capabilities

OUR ROLLING TOLERANCES

Our rolling divisions, Ulbrich Specialty Strip Mill (USSM) and Ulbrich Precision Alloys (UPA), provide specialized strip metal coil, not readily available from others, engineered to exacting specifications. Cold Rolling is the cornerstone of Ulbrich, and the heart of the conversion process. Rolling at Ulbrich is considered “cold rolling” because we do not increase the temperature of the material before we roll it. Our ability to deliver a customized and consistent product within precision and ultra precision tolerances allows us to provide our customers the material they need to create enhanced products and processes. The Ulbrich strip mills' diversity of equipment and experienced staff enables us to establish robust processes capable of supplying a precise and consistent product for use in a wide variety of applications across multiple industries.

THE SLITTING PROCESS

Slitting can serve as both the initial and final operation in the conversion process at Ulbrich. All of the slitters are similar in concept and operation, but vary greatly in size. Our larger machines are dedicated to slitting the heavy gauge incoming coils up to 54″ wide to mults used for re-rolling. At the other end of the process, slitting is used to separate a material at finish gauge and temper into the width ordered by the customer. Apart from width: edge condition, coil inner diameter, coil support, coil size, interleaf and accumulation method are all characteristics of the final product that are realized during final slitting. Our operators will make adjustments to the clearance as they are preparing to slit the material in order to minimize the edge burr as much as possible. Once a coil is slit to final width, it can be packaged and delivered to the customer.

ULBRICH ROLLED STRIP SIZE RANGES

Thickness Range: .0003″ – .125″ (0.0075 – 3.175mm)

Thickness Tolerance (Standard): +/- 3% standard
(Tolerances better than 1% can be achieved based on criteria)

Thickness Tolerance (Extreme): +/- 1%

EDGING AVAILABLE

#1 ROUND EDGE

#3 SLIT EDGE

#5 SQUARE EDGE

PRECISION ROLLED STRIP COIL SIZE RANGES

Width Range: .016″ – 48″ (0.406mm – 1219mm)

Width Tolerance (Standard): +/- .005″ (+/- 0.127mm)

SERVICE CENTER SLIT COIL SIZE RANGES

Width Range: .065″ – 52″ (0.8128mm – 1320mm)

Width Tolerance: +/- .005″ (+/- 0.127mm)

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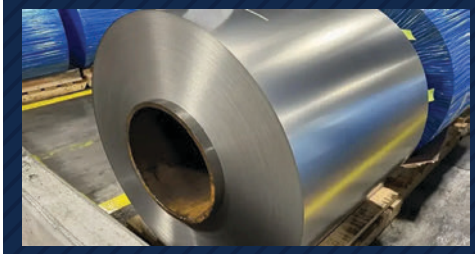
Wide-Width, Light-Gauge Precision Strip Rolled for Peak Performance

From titanium and stainless steels to high-performance nickel and cobalt alloys, Ulbrich provides the right material, rolled to precise specifications, to meet the most demanding requirements in aerospace, medical, semiconductor, automotive, and many other critical industries.

Unmatched Precision Rolling Capabilities

AVAILABLE AT ULBRICH PRECISION ALLOYS AND ULBRICH SPECIALTY STRIP MILL



Wide Width

WIDTH RANGE:

.016 – 48”

(.406 – 1219 MM)

Tolerance: +/- .005" (+/0.127mm)

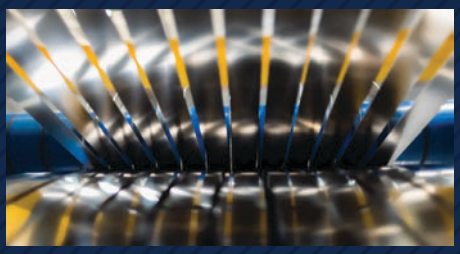
Light Gauge

THICKNESS RANGE:

.0003 – .125”

(.0075 – 3.175 MM)

Tolerance: +/- 1-5%



165+ Alloys

SPECIALTY ALLOYS AVAILABLE

Including titanium, stainless steel, nickel-based & other special metals

Wherever You Are in Product Development, Ulbrich Can Be Your Strategic Partner

Whether you're developing a new product or ramping up full-scale production, our metallurgical expertise, advanced manufacturing facilities, and commitment to engineered excellence help you move faster, minimize risk, and deliver higher-performing parts.

Ulbrich

We Deliver Precision®

BUILT FOR CRITICAL APPLICATIONS

- Edge-Welded & Hydroformed Bellows
- Heat Shields & Thermal Insulation
- Nuclear Reactors & Land-Based Gas Turbines
- Plate Heat Exchangers & Titanium Shims
- Flexible & Heater Circuits
- Medical Devices & Implantable Components

START BUILDING WITH PRECISION

Ulbrinox Receives IATF 16949:2016 Accreditation

Ulbrinox is pleased to announce that it has been International Automotive Task Force certified. The IATF is a group of automotive manufacturers whose mission is to provide improved quality products to auto customers across the globe. Ulbrinox has been ISO 9001:2015 for several years now, and having that certification was a prerequisite to acquiring IATF 16949:2016. Although Ulbrinox has received the IATF cert, it will continue to uphold the ISO 9001:2015 certification in tandem. The IATF certification focuses on quality in specific ways and in all facets of the automotive market.

The process of achieving this certification took over 2 years' worth of planning, implementing, and completing the final execution. The process required extreme diligence; with all processes regarding automotive manufacturing calling for stringent documentation. The IATF 16949:2016 certification ensures overall quality, from the products themselves to customer service. This means that all Ulbrinox products undergo rigorous testing to be free of defects and flaws.

Ulbrinox is committed to ensuring that their automotive customers, as well as customers in other markets, receive extremely efficient and reliable service. With large auto manufacturers moving to Mexico, Ulbrinox will be a local IATF certified option, and one of the few available in North America. Its strategic location in the state of Querétaro allows them to satisfy the needs of the market in Mexico, as well as North, Central & South America. Ulbrinox has provided global solutions to the metals industry since 1997. Being a division of Ulbrich, they are supported by our inventories & the benefits of a worldwide company with nearly a century of experience.

This is a huge milestone for the company, as being IATF 16949:2016 certified recognizes the level of service & quality of metal products that Ulbrinox supplies to the auto manufacturing industry. Ulbrinox has a long track record of handling the challenging demands of the auto market and is happy to be recognized through this certification as a premier supplier to the growing Automotive Industry in Mexico.

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Manage Global Risk by Reshoring Your Supply Chain

In today's volatile supply chain environment, manufacturers are under increasing pressure to reduce risk, maintain consistent quality, and improve lead times. Find stability, speed, and strategic control with Ulbrich's sourcing strategies, tailored to your unique needs.

Need metal melted and manufactured in the U.S. to avoid tariffs? We offer it. Prefer global sourcing? We're a domestic partner that can manage its complexity for you. Unsure which? We can help you find the most effective path forward.

Why Leading Manufacturers Choose Ulbrich

MATERIALS WE SUPPLY

We provide leading manufacturers Precision Strip, Shaped & Fine Wire in 165+ specialty alloys, including:

- Stainless Steels (300 & 400 series, PH grades)
- Nickel & Cobalt Alloys (Inconel®, Hastelloy®, Haynes®)
- Titanium & Titanium Alloys

- **Hybrid Sourcing Model:** Global and domestic material access with regional reliability.
- **Custom-Engineered Material:** Tight tolerances, tailored specs, and consistent quality.
- **Speed & Flexibility:** Support for rapid prototyping and quick-turn production.
- **Inventory Optimization:** Buy in smaller, more frequent batches to improve cash flow.
- **Expert Support:** From metallurgical guidance to supply chain planning, we help you navigate complex challenges and stay production ready.

INDUSTRIES WE SUPPORT

- Automotive
- Aerospace & Defense
- Energy & Power Generation
- Medical Devices
- Oil & Gas
- Industrial Components
- Electronics & Semiconductors

BRIDGING GLOBAL REACH WITH DOMESTIC SUPPORT

Whether you're seeking tariff relief, shorter lead times, or more control over critical inputs, Ulbrich can help. Our domestic reroll mills and service centers are backed by a global sourcing network, giving you options without the headaches.

Ulbrich®

We Deliver Precision®

DISCOVER HOW ULBRICH CAN HELP YOU CREATE A MORE RESILIENT SUPPLY CHAIN

Dedicated Leadership in Automotive Metal Distribution

ALWAYS LOOKING FOR WAYS TO INNOVATE & IMPROVE UPON AUTOMOTIVE APPLICATIONS

In addition to our state-of-the-art capabilities in rolling, slitting, and annealing, Ulbrich is continuously testing, researching, and analyzing alloys and their chemical and mechanical properties to maximize performance potential. What does this mean for you? It means when you partner with Ulbrich, you not only get the best of the best in personnel, process, and product—you also get a promise of a team that truly cares about making your automotive parts as consistently successful and effective as possible.

GLOBAL REPRESENTATION WITH SERVICE & DISTRIBUTION CENTERS LOCATED WORLDWIDE

Ulbrich Stainless Steels & Special Metals, Inc., is a family owned company in its fourth generation of leadership. Established in 1924, Ulbrich has become a critical supplier of stainless steel & special metals to various industries throughout the globe. During this time, we have participated in the development and manufacturing of hundreds of innovative applications. With industry leading Dimensional Control, real time gauging and Statistical Process Control (SPC), a large variety of specialty alloys, and the best customer service available, we strive to produce and distribute the highest quality materials to you. Ulbrich is comprised of a series of manufacturing divisions that supply precision strip and foil, round, flat, fine, and shaped wire, as well as sheet, plate, bar & tube, all with local management and designed to provide custom metal products to satisfy the needs of automotive manufacturers around the world.

YOU HAVE IDEAS. WE HAVE RESOURCES. PARTNER WITH LEADING EXPERTS.

With Ulbrich's world-class Development Innovation Team, you can gain access to product specialists and quality metallurgists, each with expertise that is best-suited for your unique raw material needs. Our team can deliver custom material solutions to maximize the performance of your application. Talk to a specialist today to learn about what finishes, edge capabilities, mechanical properties, packaging and lengths we can offer for your project! Learn more about Ulbrich's Development Partnership online at **www.ulbrich.com/company/development-partnership** or call **1-800-243-1676**

CONTACT *Ulbrinox* FOR YOUR MEXICAN AUTOMOTIVE MARKET NEEDS!

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