



We Deliver Precision®

Divisional Products
& Capabilities

SHAPED WIRE

If you can dream it, we can shape it.

Cold-Rolled Shaped Wire

Our shaped wire rolling facilities offer various dimensional capabilities, producing from the smallest cross-sections to the very largest. Our multiple flat wire rolling mills and Turks head mills roll your custom shapes to size. The process includes intermediate anneals when necessary.



More than
160+ Alloys

Our shaped wire is available in over one hundred alloys and can be produced to specific physical properties. Reduce scrap costs and eliminate outside processing with rolled or shaped wire cut-to-length or in continuous coil form.

Our Services

Beyond supplying best-in-class wire products, we support our customers with supply chain management and metallurgical expertise, plus we consider ourselves partners in pivotal research and development initiatives.



Supply Chain Management

Our logistical expertise and far-reaching relationships can help all the pieces of your production flow work seamlessly together.



Research & Development Support

Almost every wire product that we shape is custom and the result of engineer-to-engineer collaboration. If you can dream it, we can shape it.



Metallurgical Support

Ulbrich's industry-leading metallurgical support can assist the decision-making process when considering the properties to choose.

Our Quality Policy

We are committed to achieving customer satisfaction through continuous improvement and to providing quality products, services, and solutions by promoting operational excellence. Our experienced technicians strive to ensure that every shaped wire product meets our exceptionally high standards and your manufacturing needs.

Certifications



**AS9100D & ISO
9001:2014**

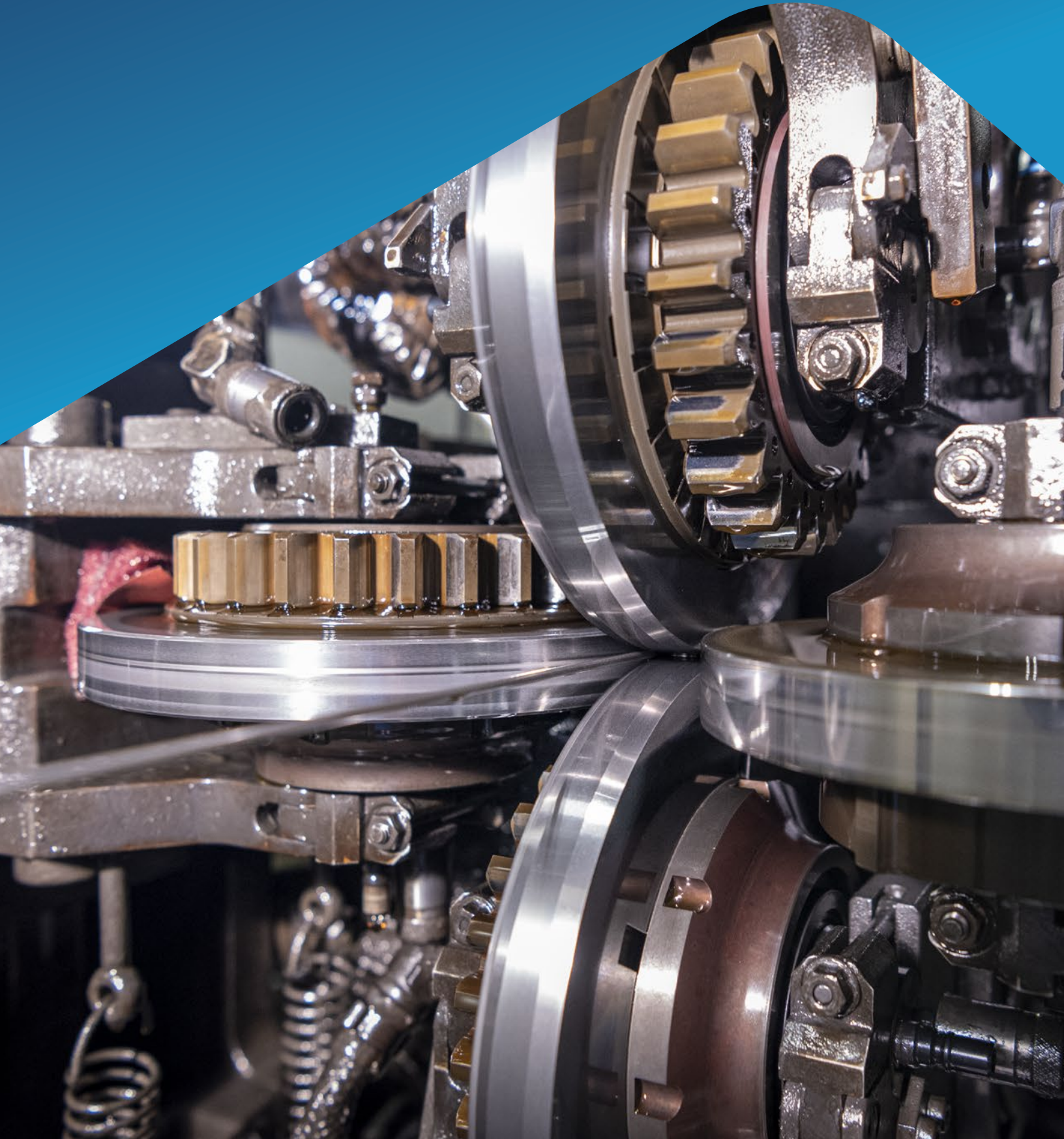


Pratt-Whitney LCS



DFARS

Shaped Wire Products



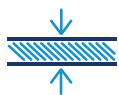
Shaped Wire Profiles

Custom Shaped Wire



Our cutting-edge shaped wire rolling mills allow us to meet the demanding dimensional tolerances your business requires. **Ulbrich has near limitless capabilities to produce custom shaped wire profiles for any application.**

Shaped Wire Gauges Offered



Gauge Range

0.005" to 0.335" (0.120mm to 8.509mm)



Width Range

0.035" to 1.50" (0.89mm to 38.46mm)

Common Shapes & Custom Wire Profiles

Most of the wire products we create are custom-shaped to the exact needs of our customers. These examples are merely starting points to give you a better idea of the custom radiuses, symmetrical or non-symmetrical shapes, custom mechanical properties, and more that we are capable of.

And many, many more!



**60° Keyway
Triangle Wire**



Bevel



Blade



**D-Wire
(Half, Large, Small)**



Dog Bone



**Multi-Gauge
Strip**



Rolled Flat Wire



Seal Strip



Serrated Shape



Star Wire



Rolled Flat Wire



Seal Strip

Our Advantages

- Net or Near Net Shapes
- Close Dimensional Tolerances
- Achieve Specific Tensile/Yield/Temper Range Requirements
- Intricate Specialty and Custom Edges
- Continuous Coils
- No Burr
- In-Process Gauge and Measurement
- State of the Art, In-House Tooling Facility
- Improved Die Wear

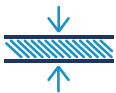
Shaped Wire Profiles

Round Wire



Stainless steel & special metal round wires rolled with the tightest tolerances and absolute precision. Our skilled metallurgists and rolling mill team can deliver finely-tailored round wire products in a wide array of alloys and finishes.

Round Gauges Offered



Gauge Range

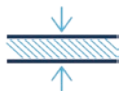
0.040" to 0.200" (1.016mm to 5.08mm)

Flat Wire



Our experienced engineers draw and flatten round wire to achieve consistent flat cross-sections in custom thicknesses and widths. Using pioneering process monitoring technologies, we can also prescribe intermediary annealing stages to remove internal stresses and yield the toughest possible wire products based on a broad range of alloys, from stainless steels to nitinol flat wire.

Flat Gauges Offered



Gauge Range

0.0005" to 0.250" (0.0127mm to 6.350mm)



Width Range

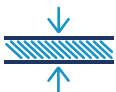
0.001" to 1.50" (0.0254mm to 38.1mm)

Square Wire



Square wire begins with round wire that is flattened during a series of rolling operations and intermediate anneals, if necessary. Ulbrich's wire products are available in over one hundred alloys and can be produced to specific physical properties. Rolled square wire offers many advantages over machined bar and drawn products.

Square Gauges Offered



Gauge Range

0.0005" to 0.250" (0.0127mm to 6.350mm)



Our Quality-Driven Manufacturing Center

55 Defco Park Rd, North Haven, CT 06473

Wire Shaping & Manufacturing Capabilities



Capabilities



Cold Rolled to Your Custom Spec

Our shaped wire rolling facilities offer various dimensional capabilities, producing from the smallest cross-sections to the very largest. Our multiple flat wire rolling mills and Turks head mills roll your custom shapes to size. The process includes intermediate anneals when necessary.

Ulbrich Shaped Wire constantly invests in capital equipment to ensure the highest quality products. Our rolling mills are state-of-the-art and production equipment uses the latest in “on-line” gauging and data acquisition technology, generating full statistical summaries with each production run. This cutting-edge technology lets us control our process and offer tolerances as tight as $\pm .0001$ ” (.0025mm), on our light gauge products.

Rolling

The primary function of our drawing lines is to **reduce the diameter of an annealed rod** by pulling it through a series of dies, each manufactured by our in-house tooling center. Once the rod has been drawn into wire, it is again annealed before we begin rolling it to your custom shape.

Drawn to Your Specifications

Drawing in-house allows us to obtain rods of various sizes, reducing costs and lead times. It also gives us all-too-important control over starting round sizes for production or research and development. And with our drawing line's extremely tight tolerances of $\pm .0002$ ” and variation within 0.0001”, we can start shaping wire at the precise size that your application requires.

Drawing



From Rod to Wire



Annealing

When a wire is worked, either by drawing, rolling, or shaping, it causes fundamental changes to the grain structure of the material, inducing hardness and reducing ductility. We use our annealing line to relieve the internal stresses created by cold work, re-softening the wire so that it can continue to be shaped.

Depending on your needs, we change the process points when we anneal so the finished product has the required tensile or hardness properties.

Continuous Annealing for Consistent Properties

We utilize hydrogen, nitrogen, and argon-controlled atmospheres to properly anneal the broad range of alloys we offer.

Capabilities



Your Shape is Our Command

Shaping

Our state-of-the-art equipment and experienced team allow us to achieve the custom shapes needed for nearly any application. Plus, because we have complete process control, we're better able to impart the mechanical and physical properties demanded by some of the most challenging applications.

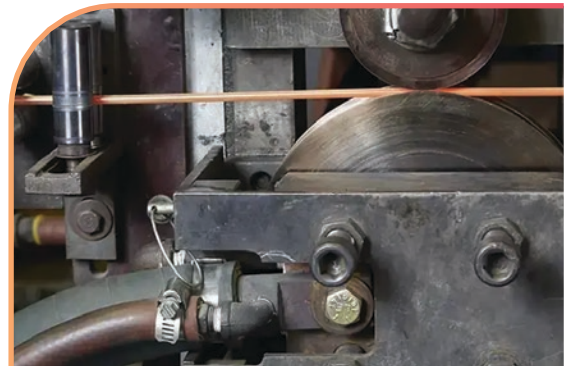
From the smallest cross-sections to the very largest, our facility offers a wide range of dimensional capabilities. Our flat wire rolling mills and turks head mills roll your custom shapes to size, with intermediate anneals when necessary.

Utilizing this cutting-edge technology, we can exercise precise control over our manufacturing process, offering tight tolerances.

Hot-Rolled

While most of our shaped wire products are cold-worked, we also have in-house, **hot-rolling capabilities** to increase the number of alloys we can shape. That's because some alloys, including titanium grades, don't respond well to cold rolling.

Even when hot-rolled, our products maintain the tight tolerances and profiled shapes demanded by the challenging applications of our customers.



Reduce Scrap & Processing



Cut-to-Length

Whether you require precision tolerance cut-to-length wire or random lengths for easy handling, we can cut it for you. Our cut-to-length capabilities include 0.500" precision cut pieces, up to 12' lengths. Your Ulbrich representative will work closely with you to determine custom cut-to-length packaging options.

Ulbrich Shaped Wire's 50+ years of experience allow us to pair your products and packaging perfectly. Your representative will work closely with you to determine the best fit for your manufacturing processes.

Packaging

In-House New England Toolmakers



📍 Shaped in New England

Based in North Haven, Connecticut, we're proud to be part of New England's storied manufacturing past and its promising future. New England toolmakers are renowned for a reason: what we machine, lasts.



Tooling Center



Turn on a Dime

Our in-house toolmakers allow us to remain nimble and react quickly to customer demands while consistently maintaining the highest quality standards. Because we have full control and oversight of our tools and dies, there's less confusion and fewer mistakes across a wide variety of different shapes and finishes.



If we need to make a change in process to achieve the result you're after, our tooling center is there to support you and your business.

Here for Your Needs



Skilled New England Toolmakers

Our team of expert toolmakers has more than 100 years of combined experience. This vast expertise allows us to prototype things very quickly, rapidly iterating to push the right product through the right equipment - usually within a couple of hours, as opposed to the days or weeks it takes to work with outside toolmaking companies.



SS Stainless Steel Shaped Wire

Stainless steel is the common name for a number of different alloys used in corrosive environments. Stainless is used to keep food surfaces and medical devices safe of microbes as it is self-repairing with its chromium oxide film. Stainless uses chromium as the unifying ingredient, but the addition of additional alloys such as nickel, nitrogen, and molybdenum create different molecular structures for varying applications.

AUSTENITIC

UNS S20100	201 STAINLESS STEEL SHAPED WIRE	UNS S30400	304LV STAINLESS STEEL SHAPED WIRE
UNS S20430	204CU STAINLESS STEEL SHAPED WIRE	UNS S30500	305 STAINLESS STEEL SHAPED WIRE
UNS S30100	301 STAINLESS STEEL SHAPED WIRE	UNS S31000	310 STAINLESS STEEL SHAPED WIRE
UNS S30200	302 STAINLESS STEEL SHAPED WIRE	UNS S31008	310S STAINLESS STEEL SHAPED WIRE
UNS S30430	302HQ STAINLESS STEEL SHAPED WIRE	UNS S31600	316 STAINLESS STEEL SHAPED WIRE
UNS S30300	303 STAINLESS STEEL SHAPED WIRE	UNS S31603	316L STAINLESS STEEL SHAPED WIRE
UNS S30323	303SE STAINLESS STEEL SHAPED WIRE	UNS S31703	317L STAINLESS STEEL SHAPED WIRE
UNS S30400	304 STAINLESS STEEL SHAPED WIRE	UNS S32100	321 STAINLESS STEEL SHAPED WIRE
UNS S30403	304L STAINLESS STEEL SHAPED WIRE	UNS N08330	330 STAINLESS STEEL SHAPED WIRE
UNS S30400	304V STAINLESS STEEL SHAPED WIRE	UNS S34700	347 STAINLESS STEEL SHAPED WIRE

MARTENSITIC

UNS S41000	410 STAINLESS STEEL SHAPED WIRE
UNS S41600	416 STAINLESS STEEL SHAPED WIRE
UNS S42000	420 STAINLESS STEEL SHAPED WIRE
UNS S42000	420LC STAINLESS STEEL SHAPED WIRE
UNS S44002	440A STAINLESS STEEL SHAPED WIRE
	CUSTOM 450® STAINLESS STEEL
UNS S45500	CUSTOM 455® SHAPED WIRE

FERRITIC

UNS S43000	430 STAINLESS STEEL SHAPED WIRE
UNS S43400	434 STAINLESS STEEL SHAPED WIRE

PH GRADES

UNS S15700	15-7 MO® STAINLESS STEEL SHAPED WIRE
UNS S17400	17-4 PH® STAINLESS STEEL SHAPED WIRE
UNS S17700	17-7 PH® STAINLESS STEEL SHAPED WIRE

DUPLEX GRADES

UNS S31803	DUPLEX ALLOY 2205 STAINLESS STEEL SHAPED WIRE
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Ti Titanium Shaped Wire

Titanium is produced as commercially pure or alloyed. Titanium is light weight, corrosion resistant and able to withstand extreme temperatures. Commercially pure titanium is generally used for orthopedic implants while the alloys are commonly produced with the addition of vanadium or aluminum for applications such as aerospace or sports equipment.

TITANIUM ALLOYS

UNS R56400	GRADE 5 TITANIUM (Ti-6AL-4V)
UNS R58153	TITANIUM 15-3-3-3
UNS R54620	TITANIUM 6-2-4-2
UNS R58210	TITANIUM BETA 21S GRADE 21

COMMERCIALLY PURE TITANIUM

UNS R50250	TITANIUM GRADE 1 COMMERCIALLY PURE A35
UNS R50400	TITANIUM GRADE 2 COMMERCIALLY PURE A40
UNS R50550	TITANIUM GRADE 3 COMMERCIALLY PURE A55
UNS R50700	TITANIUM GRADE 4 COMMERCIALLY PURE A70

Alloys



Ni Nickel

Nickel Alloys are named for the significant amount of nickel used as it's unifying or principal ingredient. Nickel alloys were developed for use in highly corrosive environments or for use in high-temperature environments (or both). The addition of other alloys such as Molybdenum, Chromium, and Iron modify the alloys for uses.

CORROSION RESISTANT

UNS N10675 **HASTELLOY® B-3**
SHAPED WIRE

UNS N10276 **HASTELLOY® C-276**
SHAPED WIRE

HIGH TEMPERATURE

UNS N06002 **HASTELLOY® X**
SHAPED WIRE

UNS N06230 **HAYNES® 230**
SHAPED WIRE

UNS N06625 **INCONEL® 625**
SHAPED WIRE

UNS R30188 **HAYNES® 188**
SHAPED WIRE

HIGH PERFORMANCE

UNS N08800 **INCOLOY® 800**
SHAPED WIRE

UNS N08825 **INCOLOY® 825**
SHAPED WIRE

UNS N06600 **INCONEL® 600**
SHAPED WIRE

UNS N06601 **INCONEL® 601**
SHAPED WIRE

UNS N04400 **MONEL® 400**
SHAPED WIRE

UNS N04401 **MONEL® 401**
SHAPED WIRE

UNS N04404 **MONEL® 404**
SHAPED WIRE

UNS N05500 **MONEL® K500**
SHAPED WIRE

UNS N02200 **NICKEL 200**
SHAPED WIRE

UNS N02201 **NICKEL 201**
SHAPED WIRE

THERMAL EXPANSION

UNS N10675 **HASTELLOY® B-3**
SHAPED WIRE

UNS N10276 **HASTELLOY® C-276**
SHAPED WIRE

Co Cobalt

Cobalt Alloys are also sometimes referred to as “super alloys”. Cobalt alloys perform well in corrosive environments and high temperatures while retaining strength. It is also used when wear resistance is required. Typical uses for Cobalt Alloys are jet engines, turbines, and dental implants.

UNS R30605 **HAYNES® 25 L-605**
SHAPED WIRE

UNS R30035 **MP35N®**
SHAPED WIRE

UNS R31233 **ULTIMET®**
SHAPED WIRE

UNS N07001 **WASPALOY®**
SHAPED WIRE

NiTi Nitinol Shaped Wire

Nitinol is a shape-memory alloy. This nickel-titanium alloy “remembers” its original, cold-forged shape: returning the pre-deformed shape by heating. Shape-memory alloys have applications in industries including medical and aerospace.

NITINOL



People & Products You Can Rely On

We are committed to becoming your most reliable partner by offering a superior business experience, exceptional knowledge in product development and prototyping, outstanding customer service, and the best technical support in the industry.

State-of-the-Art Equipment

Failure is not an option for our products, and we know it. Our team of skilled engineers and product specialists use top-of-the-line testing equipment to ensure our customers receive the highest-quality products in today's marketplace.



Markets We Serve

AEROSPACE

CONSUMER

MEDICAL

OIL & GAS

INDUSTRIAL

POWER



Stamped Parts Manufacturing:

THE BENEFITS OF SHAPED WIRE

Insights from industry

Mike Geiger
General Manager

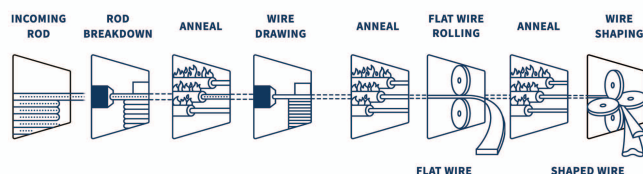
Can you give us an introduction into stamped parts?

I'd be glad to! Stamping, or pressing, typically involves continuously running flat metal in coil form through a tool and die. The output of that process results in a stamped product manufactured to the specification needed for the part. Some manufacturers also utilize blanks for their production, which are also used for individual stamping.

A stamping press is designed specifically for stamping metal parts out of raw material, and upon running material, a tool and die will form the metal into a specified shape. Several types of stamping techniques may be used to achieve an end product, including punching, blanking, bending, coining, and more. Each of these processes can be effective in arriving at the desired shape, and there are different cost variables involved with each.

How does starting with a shaped wire product differ from the above, and how can it be used as a supplement to stamped parts?

Glad you asked! At Ulbrich Shaped Wire, we produce a shaped material manufactured into its final profile by rolling round wire flat and then shaping the material by pulling or pushing the material through steel rolls. Shaped Wire can supplement the stamping process by pre-rolling in features to the material that cannot be stamped in. This is a tremendous benefit to stampers!



Using a pre-formed profile allows the stamper to start with a near-net shape, potentially replacing some initial stamping or forming steps. The elimination of these steps could increase overall production yield by reducing processing time, tooling costs, and scrap. An example would be rounded sides or bladed and razor-like edges.

What benefits does shaped wire offer to stamped part manufacturing?

More and more manufacturers are focusing on reducing scrap from production. This is not only beneficial to the environment and the manufacturer's bottom line, but customers also see a reduction in cost and turnaround time, making the manufacturer more competitive. As many stamping processes are multi-step, progressive processes, less scrap is typically produced since a shaped wire product may eliminate certain stages or steps that may otherwise be necessary.

Generally, using a Shaped Wire product can provide tighter tolerances over the alternative, which might help eliminate these when using regular flat material. This is possible through our capabilities to pre-shape material.

Another benefit that the ability to pre-shape wire presents is in reducing costs due to the potentially high expense of tooling/dies. Quite often, tooling is the costliest part of the stamping process, outside of a press's initial cost. The dies must be acquired, and if there is a custom aspect to them, the time it takes to have them manufactured translates into even more cost. As we all know, time is money in the manufacturing world. Suppose a pre-shaped product might afford the manufacturer the chance to eliminate the need to buy tooling while also reducing the number of potential die changes that must be made. In that case, there is an added cost reduction benefit to be had.



Can you tell us about Ulbrich Shaped Wire (USW) and the different types you provide?

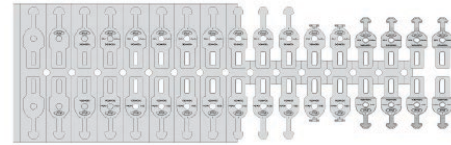
I'm incredibly proud of the fact that Ulbrich Shaped Wire has become synonymous with metallurgical and technical excellence. It's a core part of who we are and something we have always hung our hat on, in addition to our broad product offering and robust supply line. This enables us to leverage a wide selection of alloys in our wire rolling mills, which furthers our rapid prototyping and custom wire profiling capabilities to develop superior wire for customers whether they require a standard or custom cross-section. We work with 300 series and 400 series stainless steels, Titanium, and Hi-temperature Nickel Alloys. Overall, Ulbrich has worked with more than 165 alloys through the years. Some of the basic profiles that we provide are half rounds with special corner radii, bladed or razor-edged flats, wedge wire and Kamm profiles, and many other custom profile products.

How does USW contribute to process improvement that benefits multiple stamping operations?

USW can provide material that may offer a stamper the opportunity to eliminate the need for tooling steps by getting the material closer to the final stamped part outcome. By minimizing the amount of setup time due to the number of tooling changes, there is an improvement in process time and cost reduction. Additionally, we can add features to the profile that cannot be achieved during the stamping process. Some of these features might include rounded sections, bladed edges, or unique dimensional requirements. One of our most powerful capabilities is our ability to partner with our customers in order to understand their operations and material needs completely, which enables us to collaborate on the design of the wire material's profile to meet their needs and optimize their production processes.

Can you tell us about how shapes allow stampers to start from a material profile?

Starting with a "near net" shape may allow stampers to remove early press operations necessary when starting with a flat blank. Reducing the number of stamping operations may reduce processing time, tooling costs, and scrap.



How does USW reduce scrap, and what is the importance behind this?

We start with a round wire product that progresses through the wire shaping process, where it is drawn down to what we require as our starting size. The drawing process elongates the wire and leaves an extremely low percentage of product leftover as scrap. This wire is then used to begin our rolling and shaping process. Fortunately, the overall scrap levels remain low, and this savings is essential as it helps provide our customers with the most competitive pricing we can offer. By combining this process with what a shaped or profiled product can offer, the stamper receives raw material that positions them very competitively once they begin running their jobs. This same benefit is afforded to our customers. When it hits their shop floor, the shape being near-net allows them to avoid the scrap that would otherwise be produced by performing the operations to achieve the shape they need to start their manufacturing. This can be incredibly advantageous from a scrap prevention perspective but also has advantages in production speed.

When it comes to developing products at USW, what are some of the critical steps taken to arrive at a product the customer will realize benefits from?

At Ulbrich Shaped Wire, we constantly analyze our operations and offerings in a never-ending quest to optimize what we do and innovate. We are extraordinarily data-driven and continually learning and iterating on the things we do and the products we sell.

On the customer side, developing a process that will provide a customer with value-added raw material begins with initial inquiry and investigation. Working together with our team of experts, Ulbrich Shaped Wire often takes concepts provided by our customers and works with them in a highly collaborative way to arrive at an outcome that will provide cost savings.

Technical conversations are very common as we ultimately want to provide a functional profile and save costs for our customers. These conversations surround the determination of alloys, material properties, tolerances, and individual needs. We take extra care to review any specifications with our customers and our best-in-class engineering and metallurgy teams to ensure quality and compliance. Upon agreement, a technical drawing is provided for approval to make sure that it meets our customer's needs. We also have a team of product managers available at all times throughout the development process for additional commercial support. Once we have ensured that we are aligned with our customers on the concept and material needs, we will produce the final profile.

How does shaped profile wire minimize costly machining?

It's all about maximizing yield and reducing scrap. I mean that by rolling the material to shape rather than removing material, we can take full advantage of the entire metal wire material. When machining metal products, there is ultimately a lot of material lost in the process. Unlike machining, when shaping wire to a specific profile, the process is essentially "squeezing" (and elongating) the material through a group of steel rolls/dies. The amount of material you started with is preserved. Since coils can potentially weigh a thousand pounds, the possibility of eliminating countless hours of machining time due to a near-net-shape result is very real.

Can you give us some real-life examples/applications of USW?

One good example of what we can provide includes blade products for specific applications. We have one customer initially using a flat strip product and needed to add processing to skive the edges. In contrast, we have been able to supply them with a shaped profile, allowing them to eliminate the additional edging operations. This was a boon to their entire manufacturing operation as it saved them a ton of time and money.



About Ulbrich Shaped Wire

Ulbrich Shaped Wire specializes in the manufacture of custom-made shapes and flats for a wide variety of industries. Depending on the profile's complexity, shapes are provided in net or near-net suitable for stamping, coining, forming, or machining. All tooling is custom manufactured in-house by our state-of-the-art New England tooling center. We also offer metallurgical and engineering support for all customers. Ulbrich Shaped Wire supplies a wide range of alloys, including advanced nickel alloys such as Inconel, Monel, and Stainless Steel, which can be provided as a flat coiled wire product.

About Mike Geiger

Mike Geiger is General Manager for Ulbrich Shaped Wire in Wallingford, Ct. Mike has over 33 years of experience in the metals industry, having served in several consultative, technical, sales, and management positions. He has worked extensively with a wide range of customers in markets including aerospace, medical, oil & gas, metalworking, industrial, consumer, and more.



Mike Geiger

General Manager
Ulbrich Shaped Wire

Where can readers find more information?
More information can be found at our website

www.ulbrichshapedwire.com

SCAN ME!





SHAPED WIRE

If you can dream it, we can shape it.

DISCOVER WHAT'S POSSIBLE



SCAN ME!

"Shaped Wire is a vital part of Ulbrich's business and I'm enormously proud of the products this division's best-in-class people and processes create."

– Chris Ulbrich, CEO of Ulbrich Stainless Steels & Special Metals



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