

SEAMLESS MECHANICAL TUBING

TAILORED PRODUCTS FOR THE WORLD'S HARSHTEST CONDITIONS

We apply our materials and applications expertise to manufacture high-performance seamless mechanical tube products to meet your needs. This includes:

- Carbon, alloy and custom grades
- Thermal-treated solutions
- Value added services

We provide tube products that thrive in demanding applications like:

- Automotive components, where performance depends on reliability and quality
- Industrial applications—ranging from bearings to cylinders and gears—where toughness is essential for functionality
- Oil and gas exploration, where durability and component life are paramount

We produce tubing sizes based on your finished part size, which offers a competitive advantage over machining from forging or general stock sizes. We also offer tubes in sizes guaranteed for cleanup at finished part dimensions, allowing for optimal material use.

We leverage global capabilities and technical expertise to generate value and improve performance for your applications. From metallurgy and engineering to manufacturing, warehousing and distribution, to green and finished components, we offer the options you need for a competitive edge.

SEAMLESS MECHANICAL TUBING

IMPROVED PERFORMANCE

We offer more than 450 grades of steel. Our manufacturing flexibility allows us to produce many of them in smaller quantities, which we determine at the time of order placement. We can meet American Society for Testing and Materials (ASTM), German Institute for Standardization (DIN) and European Standards (EN) requirements as well as your specifications. We are an ISO 9001 registered company.

Our complete offering of value-added solutions includes cut rings, green machined blanks and finished machined components.

TUBE PROCESSING

Piercing (Rotary Forging)

Piercing a seamless steel tube is a forging operation in which the metal is worked from both the inside and outside. We convert a solid bar into a hollow shell by displacing material over a mandrel during rotary drilling, resulting in a refined grain structure and uniform grain flow.

Subsequent tubing processes include elongating to reach desired wall thickness, rolling to achieve outside diameter and rotary sizing to round the tube diameter to the final required dimensions. We continuously monitor these operations to produce a tube with uniform properties.

Thermal Treatment

We house multiple thermal treatment facilities that provide a diverse range of processing options to meet demanding strength and hardness requirements, regardless of order size. These include batch and continuous heat treat lines that utilize induction and combustion furnaces. We can provide the following thermal treat conditions: annealed, normalized, tempered, stress relieved/stress free and quenched and tempered. We continue to advance our capabilities and broaden our sophistication in thermal treatment offerings so you can rely on innovative product designs and proven quality.

TESTING AND FINISHING

The Intermediate Finishing Line (IFL) employs the latest technologies and lean processes for testing and finishing seamless mechanical tubes. This eliminates product touches and minimizes movements, helping improve lead times.

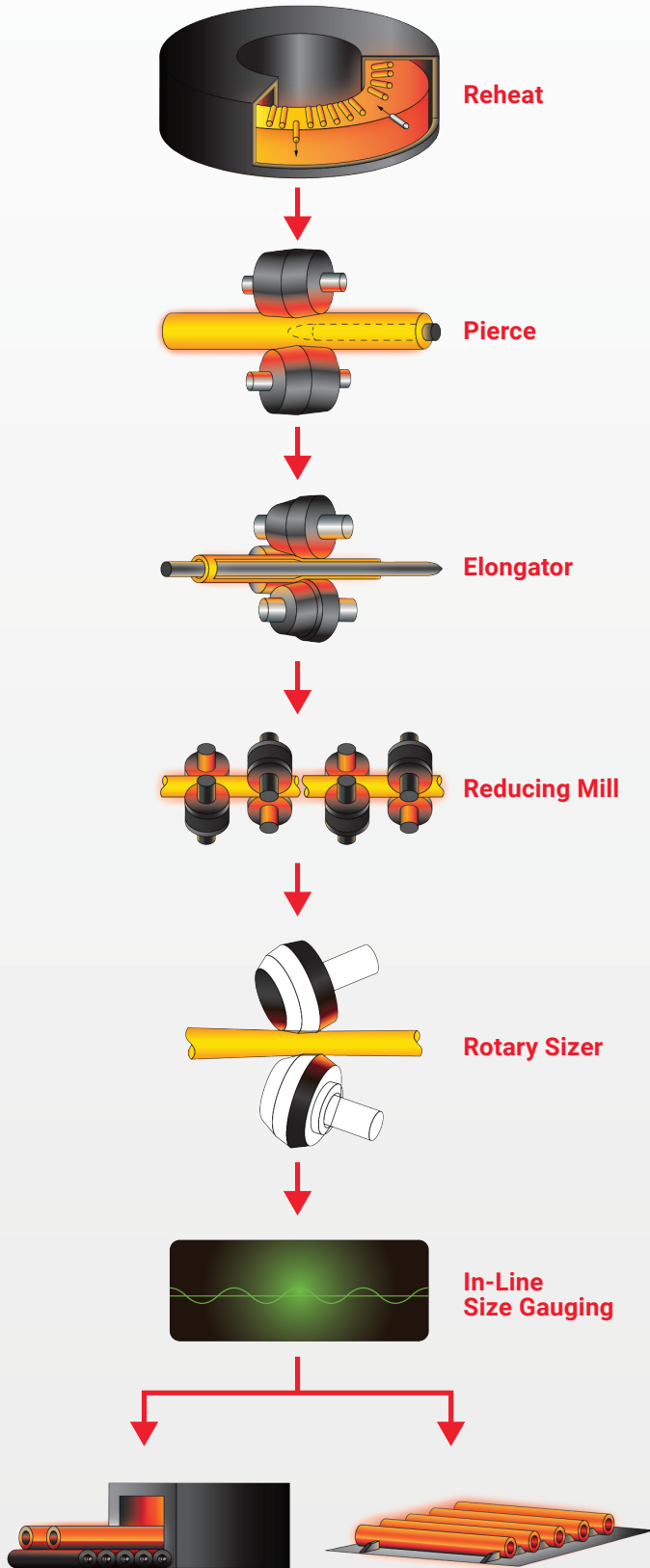
IFL finishing processes include straightening, water blast scale removal, cutting, ultrasonic testing, eddy current testing and dimensional gauging. IFL testing capabilities include hardness, strength, toughness and cleanness testing.

Metallus is the only company in North America with this type of operation for seamless mechanical tubing.

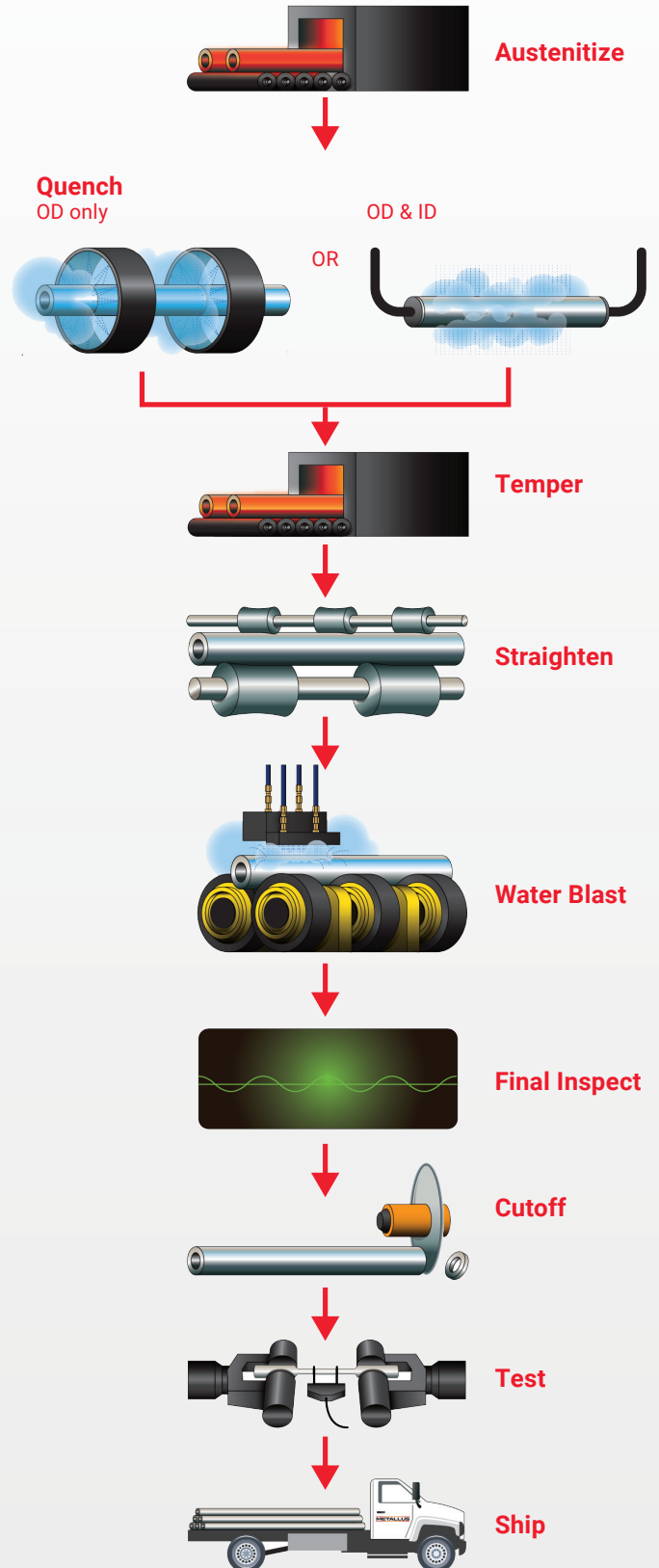
HOT-ROLLED TUBE TOLERANCES

Tube Diameter	Diameter Tolerances for Hot-Rolled or Single Thermal Treat	Diameter Tolerances for Quenched and Tempered or Normalized and Tempered (OD and Wall or ID and Wall Dimensions Only)	Tube Wall Tolerances
Up to and including 10.75" (273mm)	inches: $T_{OD} = \pm (0.0045 OD + 0.005)$ OR ± 0.015 min. mm: $T_{OD} = \pm (0.0045 OD + 0.130)$ OR ± 0.38 min.	inches: $T_{OD} = \pm 1.5 (0.0045 OD + 0.005)$ OR ± 0.023 min. mm: $T_{OD} = \pm 1.5 (0.0045 OD + 0.130)$ OR ± 0.58 min.	OD to Wall ratio over 10:1 = $\pm 10\%$ or ± 0.020 " min. (0.51mm) OD to Wall ratio of 10:1 or less = $\pm 7.5\%$ or ± 0.020 inch min. (0.51mm)
Over 10.75" (273mm) through 12.0" (305mm)	inches: $T_{OD} = \pm 0.095$ mm: $T_{OD} = \pm 2.41$	inches: $T_{OD} = \pm 0.113$	$\pm 10\%$ or ± 0.020 min.
Greater than 12.0" (305mm)	inches/mm: $\pm 1\%$	inches/mm: $\pm 1\%$	Walls less than 1.5" (38mm) = $\pm 12.5\%$ Walls 1.5" (38mm) and greater = $\pm 10.0\%$

TYPICAL STEEL PIERCING PATH



TYPICAL QUENCH AND TEMPERED TUBE FINISHING PATH



TUBE QUESTIONS AND ANSWERS

What grade and quality do you need?

We produce more than 450 grades of steel in quality levels, including aircraft, bearing and commercial, electric furnace and Parapremium™.

Does your order require thermal treatment?

We offer annealed, normalized, quench and temper, stress relieved and temper treatments.

What quantity do you need?

A minimum order is 10,000 pounds (4.5 t). For foot weight over 100 pounds (45kg) per foot, the minimum order is 20,000 pounds (9.1 t).

What lengths are most appropriate?

You can order random lengths, multiples or lengths cut to your specifications.

Do you have certain required specifications?

We make all of our steel to order, so we can meet your specifications.

What tube size do you need?

We can calculate a size based on the size of your finished part and your machining parameters.

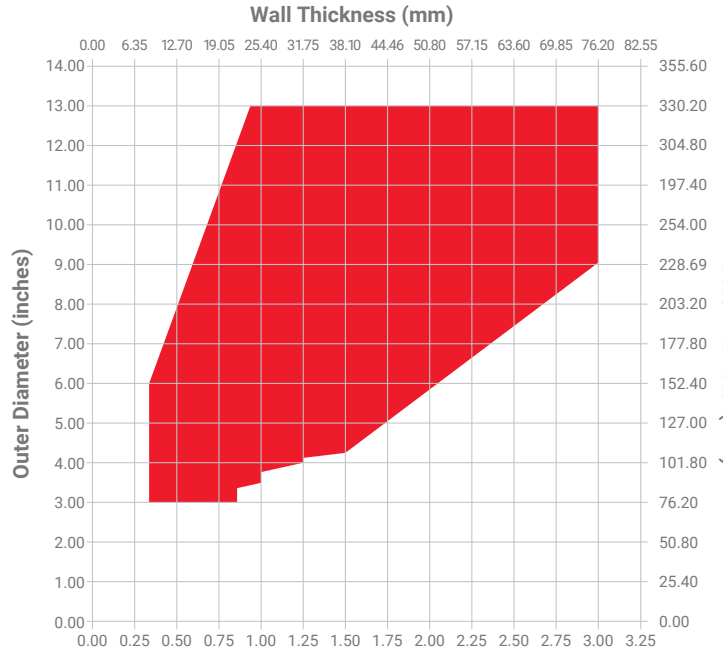
What is the machining sequence?

Is the part chucked on the OD or ID? Is it chucked at one or both ends? Your machining sequence affects your optimal tube size recommendation.

What type of cleanup of OD and ID do you need?

Full cleanup is the removal of all surface imperfections (seams, decarb, scale, etc.). See the warranty information on your order acknowledgment sheet. In addition, bright metal cleanup is the removal of the as-supplied surface, but not necessarily all surface imperfections.

SEAMLESS MECHANICAL TUBE SIZE RANGE



WE SEE METAL DIFFERENTLY

SELECTION

500+ common grades

Metallus-exclusive steels

Cleanest air-melt steel

SIZE

SBQ bar 1" to 16" (25mm–406mm)

SBQ rounded-corner squares 3.1" to 12.5" (79mm–318mm)

Seamless tubing 3" to 13" (76mm–330mm)

STRENGTH

Centralized operation (Canton, Ohio)

1.2 M tons annual melt capacity across three plants

Premier heat treat capabilities; largest vertical bloom caster in NA

SERVICE

End-to-end program and supply chain management

Technical support and testing

Application and conversion services

STEWARDSHIP

100% of products include recycled material

EAF process with less emissions than a blast furnace

44% drop in combined Scope 1 and 2 GHG emissions since 2018

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