

# DOM Mechanical Steel Tubing



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ArcelorMittal

## Tubular Products Division of ArcelorMittal: A Pioneer in DOM (Drawn-Over- Mandrel) Tubing

Tubular Products is a North American pioneer in the manufacture of DOM (Drawn-Over-Mandrel) mechanical tubing, having produced this product for more than 60 years. During this period, we have forged a reputation for innovation and technical superiority in its production and use.

Today Tubular Products produces DOM mechanical tubing at two of its locations—Shelby, Ohio, and Woodstock, Ontario.

Our DOM tubing is available in one of the most extensive size ranges in the world—one that continues to grow. It is supplied in as-drawn condition unless otherwise specified. A specialized product, *TuffDOM*<sup>®</sup> tubing, is designed for the most demanding applications, in particular those involving fluid power. It is described in a separate brochure.

Our lengthy experience in the manufacture of DOM tubing has allowed us to reduce the guaranteed machining, honing and centerless grinding allowances for this product as much as 50% from normal industry standards, and to guarantee OD and ID tolerances that are tighter than commercial standards.

We also produce quenched and tempered DOM tubing for specialized applications, as well as Special Smooth ID (SSID) tubing for hydraulic and pneumatic cylinder and similar applications.

Most commonly produced from low and medium carbon steels such as 1020 and 1026, Tubular Products' DOM tubing is also available in other standard steel grades such as 1008, 1010, 1015



and 1035; in special grades such as 1024, 1040, 1045 and 1050; in alloy analyses (ALDOM<sup>®</sup>) 4118, 4130, 5130, 8617 and 8620; and in near-equivalent DIN grades.

## Building Quality Into Our DOM Tubing

All of Tubular Products' manufacturing facilities for DOM mechanical tubing are certified as meeting ISO 9002 quality standards. The Shelby Facility recently was awarded the auto industry's demanding TS:16949 quality management system.

A major contributor to this performance is our use of Statistical Process Control (SPC). Our short-run SPC technology

has been accepted by the federal government and was instrumental in achievement of quality certifications.

Short-run SPC has been adapted, for example, to control size in cold drawing. Target values transform dimensional data so that a single continuous control chart can be utilized at each bench. A multitude of sizes in our "job shop" environment are controlled by the same SPC chart.

Extensive testing and inspection programs at each plant include sophisticated in-line equipment and fully equipped metallurgical laboratories. As a result, our DOM product is subjected to a full range of nondestructive and destructive tests, as well as visual and instrumental inspections, to assure strict compliance with specifications.





## Advantages of Our DOM Tubing

Tubular Products manufactures DOM tubing to ASTM Specification A513, types 5 and 6, using the Electric Resistance Welding (ERW) process. This process produces the highest weld strength possible. Because it is cold-drawn after forming, DOM also offers a number of other advantages:

- The uniform wall thickness of DOM, with closer OD and ID tolerances, provides maximum concentricity.
- Thermal treatment prior to cold drawing crystallizes the grain structure of the tubing and weld area, giving it a uniform, controlled hardness.
- Cold working gives DOM higher yield and tensile strength than as-welded product. Thermal treatment following drawing can give increased ductility when desired.
- The OD and ID surfaces of DOM are cleaner, smoother and more dense than as-welded product. The reduction of the tube during cold drawing removes all dimensional evidence of the weld.
- DOM tubing can be manufactured to an almost infinite range of diameters and walls by varying the sizes of the die and mandrel. This size range



allows end users to achieve material savings and lower machining costs through selection of a size that matches the dimensions of the finished product.

- The tight tolerances, controlled mechanical properties and uniform, dense surface of DOM all result in good machining characteristics.
- Shock absorbers
- Gas springs
- Printing, textile and paper mill rolls
- Bearing races and spacers
- Machined tubular parts of many types.

## DOM Mechanical Tubing Applications

Tubular Products' DOM tubing is the preferred choice for a wide range of static and dynamic applications. Some of these are among the industry's most demanding:

- Hydraulic applications including telescopic cylinders, barrels and plungers
- Axles
- High-speed shafts

Primary markets for DOM tubing in these applications include autos and trucks, construction equipment, farm machinery, oil and gas industry tooling, and industrial machinery. Tubular Products DOM tubing may also be purchased—in less than mill production quantities—from leading steel service centers throughout North America and abroad.



## The Manufacturing Process

Tubular Products' DOM tubing is roll-formed, electric-welded and sized on modern mills designed especially for high-quality, high-speed tube production. Inside and outside weld flash is removed during the process, and every foot is tested for weld integrity with sophisticated in-line equipment. Tubing is cut to length as it comes from the mill.

The tubing then goes through a cold drawing process which creates a uniform, precision product with substantially improved tolerances, surface finish and tensile strength, increased hardness and good machinability.



Prior to the cold drawing operation, tubing undergoes a thorough cleaning in a caustic wash; normalization in a continuous, controlled-atmosphere annealing furnace; cold pointing of one end of each length; pickling and lubrication.

The tubing is then cold-drawn over a mandrel and through a die. This operation transforms it in size, appearance and homogeneity and improves its dimensional accuracy and strength. The best characteristics of the as-welded tube are retained and refined, and the DOM product assumes dynamic new characteristics.

The cold drawing operation reduces the diameter of the as-welded tube shell and thins its wall to required dimensions in a controlled fashion to provide the properties desired in the finished product. This process improves the tube's concentricity, tensile strength, hardness and machinability. Close dimensional accuracy is achieved through positive control of both inside and outside diameters.

## Customer Service Hot Lines at Tubular Products

Tubular Products operates a highly efficient, customer service organization for the convenience of DOM mechanical tubing customers. The telephone numbers to call are:

Shelby, OH 800-345-8823  
Woodstock, Ont. 800-265-4082

### MECHANICAL TUBING BUSINESS

Contact us at the following location:

132 West Main Street, Shelby, OH 44875-1471  
Telephone 800-345-8823 • Fax 800-552-9943

[www.arcelormittal.com/tubular](http://www.arcelormittal.com/tubular)



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