

# MECHANICAL AND OLEODYNAMIC TUBES

METALLURGICA VENETA distributes a wide dimensional range of cold-drawn seamless precision tubes used to manufacture hydraulic cylinders, and mechanical seamless tubes, warm drawn, for applications in the mechanics and the construction of machines, tamplus.

## Precision seamless tubes for hydraulic cylinders.

They are produced with two dimensional series with limited tolerance values to undergo, on the inner diameter, to peeling and rolling or polishing.

Two different grades of easily weldable steel are used, both of which can be supplied with a treatment of the inclusions so as to guarantee improved tool machinability.

The product can be supplied with two different machining allowances, either the 'DL Series' or the 'DP Series'.

The DL series is characterised by a limited internal machining allowance which makes the tubes suitable for honing and/or lapping operations.

The DP series includes a kind of machining allowance which makes it possible for the tubes to undergo both skiving treatments with detachable chips and roller burnishing on their internal diameter.

Steel grades :The supplied products can be made out of two different types of steel, either the PHC 355 or the PHC 460 type, and they can be supplied in two different supply conditions, either SR (stress relieving thermal treatment after the last cold-drawing operation) or N (normalizing treatment after the last coldrawing operation). Such supply conditions correspond to the following standards:

### \* A Option

The PHC 460 grade can be produced with a controlled sulphur content of  $0.020 \div 0.035\%$ , so as to allow a better tool machinability.

### \* B Option

It is possible to ask for different heat treatments, mechanical properties and steel grades.

## Hot rolled seamless tubes for mechanical applications.

They are in Metallurgica Veneta in accordance with UNI EN 10297-1. These products are to be used in the fields specified by the "Machinery Directive 98/37/EC", as well in mechanics and in the field of machinery construction. Particular applications, such as pressure vessels and structural applications, are not included. These applications refer to other EN standards, EC Directives or national laws in force in the different countries where the products are used. Metallurgica Veneta has various Service Centers at its disposal, where it is possible to ask for additional machining operations, such as cut to measure, chamfering, drilling and boring, as well to agree on quantities, markings, and packaging. Steel grades : the following tables contain data on the applications, chemical analysis and mechanical properties of the stocked steel types. The products are designed in accordance with the EN 10297 standard and fulfill all the requirements foreseen by the relevant national regulations.

Steel Grade	Application
E235	Steel for mechanical applications
E355	Steel for mechanical applications
E355K2	Steel for mechanical applications, with guaranteed toughness

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To this family belong also the tubes suitable for mechanical applications exceeding the standard for:

- **Workability:** micro-incisions of manganese sulfide in steel, thanks to the lubricant in the interface tool - chip, delay the wear of the cutting edge and help crush the chips and thus facilitate the workability of the piece.

Advantages:

- Lower temperatures of the tool, with the same pass, with the possibility of increasing the cutting speed.
- Reduction of the shear stress, less wear and increase tool life.
- Reduction of the edge.
- Chip evacuable more easily.

- **Tight tolerances on thickness:** through the process of cross-lamination.

Advantages:

- No rough spots, after machining.
- Reduction of the weight of the pipe to effect a thickness smaller than necessary to obtain, by machining, the size of the finished piece.
- **Straightness:** the controls of the process, allow to obtain a straightness equal to or less than 1 ‰ accumulated over the entire length of the tube.

Advantages:

- Improved concentricity with consequent reduction of the chip to be removed.
- Reduced vibrations / oscillations inside the machine.
- Reduce downtime.
- Increased productivity.

METALLURGICA VENETA has various Service Centres at its disposal, where it is possible to ask for additional machining operations, such as custom-made cuts, chamfering, drilling and boring, as well as to agree on quantities, markings, and packaging different from the ones included in this catalogue.