

## AUTOMOBILE INDUSTRY

### Tubes

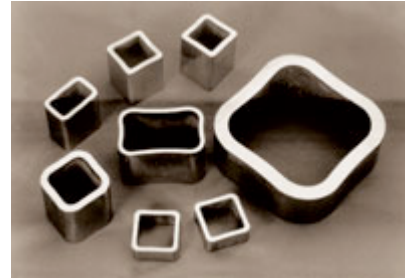
BERAL supply automobiles tubes to virtually all international specifications and in a large range of steels. In addition to using standard steels BERAL can also supply tubes from customized steel grades for instance Tellurium steel, which it is able to source in-house.

The steel used for the manufacture of these tubes is produced by the electric arc furnace route, is fully killed and vacuum degassed. As a result, these tubes have a very high strength-to-weight ratio and good fatigue-resistance properties. In addition, because of the Assel-Mill process used by BERAL these tubes are characterized by their very tight tolerances and excellent concentricity, thus minimizing the requirement for final machining.

In the automobile industry BERAL tubes are used extensively for the manufacture of steering columns, front and rear axle casings, tie rods, bearing races, CV cages and other annular components.

#### Tube Tolerances

Description	OD (%)	Wall t (%)
Hot rolled D/t 3.5 - 9.9 D/t > 9.9	+/- 0.75% +/- 1.0%	+/- 7.5% +/- 10%
Cold rolled	+/- 0.5% subject to +/- 0.25 mm minimum	+/- 5.0%
ID Calibrated Tubes	Higher of +/- 1mm or +/- 1%	As per Category



Note: Closer tolerances can be offered upon special request.

#### Straightness

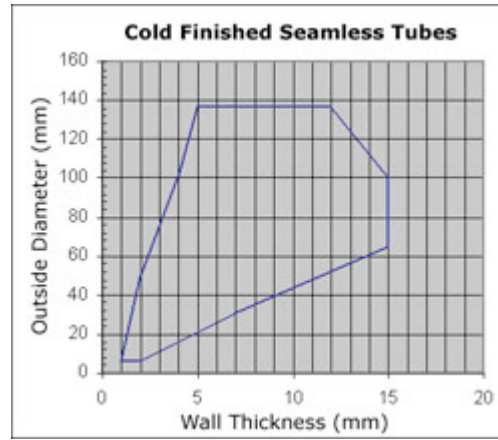
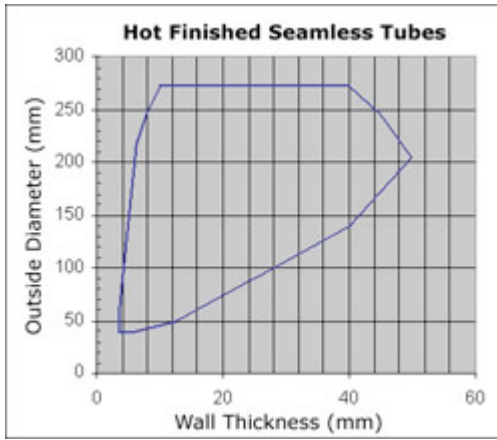
Hot finished tubes - 1 : 600

Cold finished tubes - 1 : 1000

Note: For special applications better straightness can be offered.



**Size Range**



### **Lengths**

Tubes are generally supplied in random lengths of 4 to 7 meters (or in a different range as per customer specifications.) Tubes in exact lengths, multiples of specified unit lengths or long lengths can also be supplied.

### **Specifications**

BS980, DIN 2391, BS 1717, IS 1601, IS 1074, JIS Gr. 6, STK 45 or any other equivalent specifications

### **Steels Grades Used**

SAE 1019, 1518, 1035, 1040, SAE 4130H, SAE 4140H, SAE 8620, 20MnCr5, 16NiCr4 and ST-62-N. Other steel grades may also be used on specific request.



### **Machined Gear Blanks**

BERAL supplies CNC turned gear blanks in case carburizing, direct hardening or nitriding steels with any desired profile and in a form that is ready for broaching, hobbing, shaving or other finishing processes.

### **Fuel Injection Tubes**

BERAL supplies precision diesel fuel injection tubes. These tubes have a very smooth, polished inner bore to ensure the laminar flow of diesel at extremely high pressures.

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