

## **TUBES SUITABLE FOR SHAFTS**

These are **SEAMLESS** tubes with tolerances on the OD thanks to whom they are suitable to be used, after a proper machining, as shafts or hollow pistons. This solution gives the possibility to reduce the weight of the total equipment, in comparison to the use of a solid bar.

## **APPLICATIONS**

These tubes are mainly used for cylinders on self-propelled cranes, hydrauilc systems for lifts, tipping pistons and telescopic cylinders for automotive and hydraulic platforms. They can replace solid piston rods for pneumatic cylinders in order to reduce mass forces in high speed pistons. Besides this application, these tubes can be used also for: high speed rotating cylinders and shafts, hollow drilling rods, guiding rods for linear actuators, drive shafts etc.

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## **WEIGHT SAVING**

The tube section optimizes the ratio between mass and stability. The following figures highlight that the ratio section modulus-stability "W:G" (stability feature) is better for a hollow section rather than for a solid bar.

Figure 1 Stability feature W: G of the solid bar and of the hollow bar.

60 W:G=1,29 50. 50 50,3 40 40 W:G=1,99 39,2 Elastic section modulus W (cm³) 34,4 30, W:G=2,12 28,4 Mass G (Kg /m) 20. 17,3 13,4 10. Solid bar Tube Tube Ø 80 mm 80 x 10 mm 80 x 7,5 mm

Figure 2
Replacement of a 70 mm dia solid bar with a 80 mm OD hollow bar.

