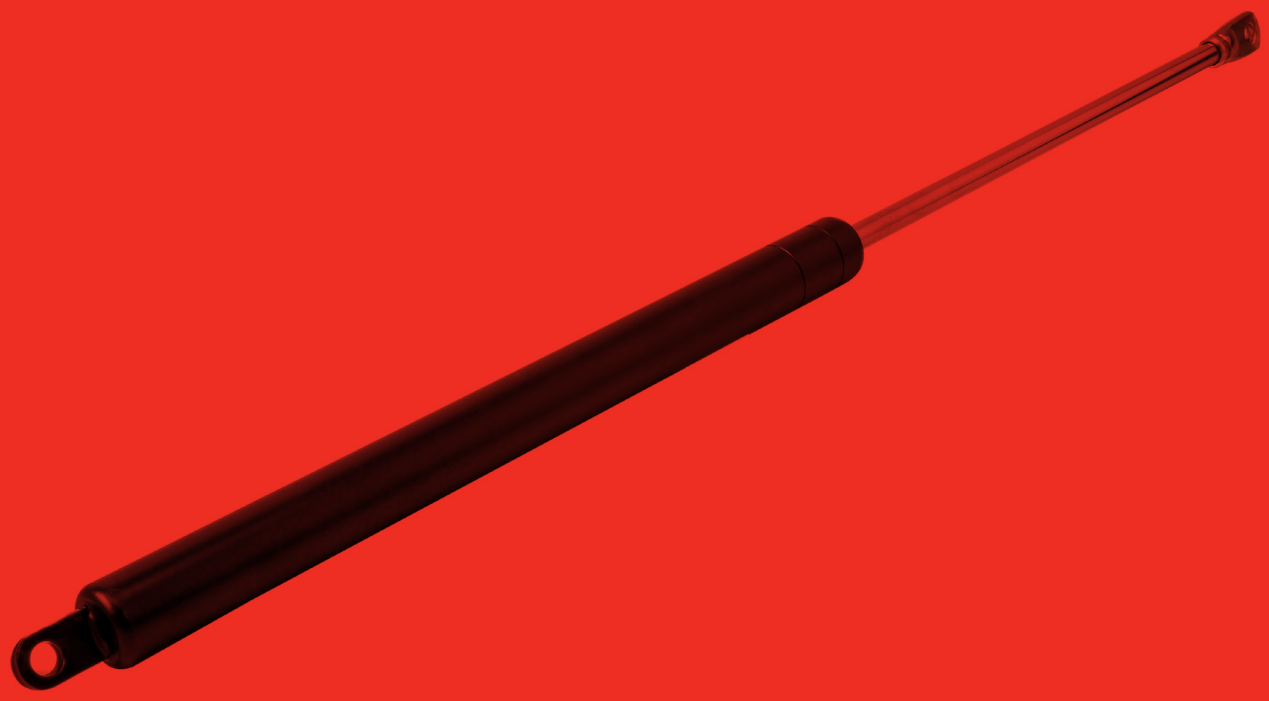


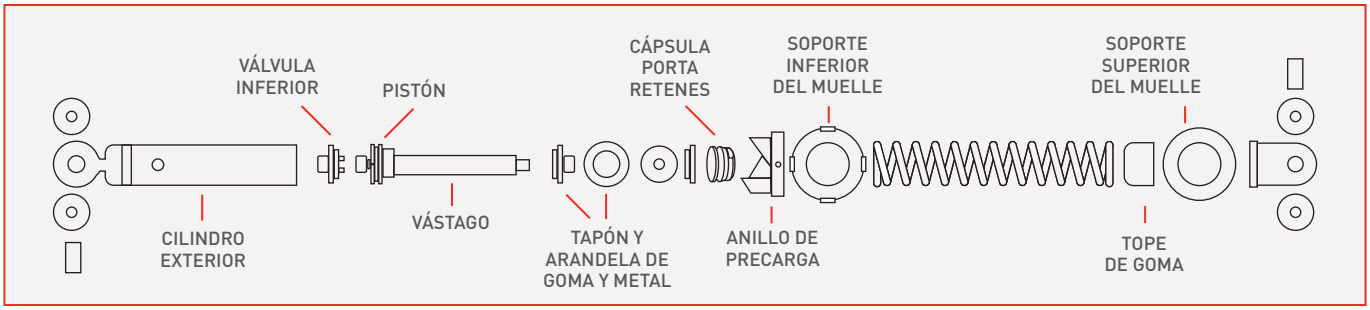
WHITEPAPER

New developments for shock absorber rods

sidenor

New developments for shock absorber rods with savings in manufacturing costs

Sidenor has developed new steel qualities which, applied to the manufacturing process of shock absorber rods, allow for cost savings in the production of shock absorbers, while maintaining all their operational properties.



Conventional tourism shock absorbers are composed of various parts, among which the rod is an essential operational element. It is a cylindrical, cut-to-size and chromed part, which is made of special steel rods with guaranteed mechanical properties and high surface quality for easier subsequent chrome-plating.

The rod manufacturing process generally includes the following steps:

Piston Rods Flow

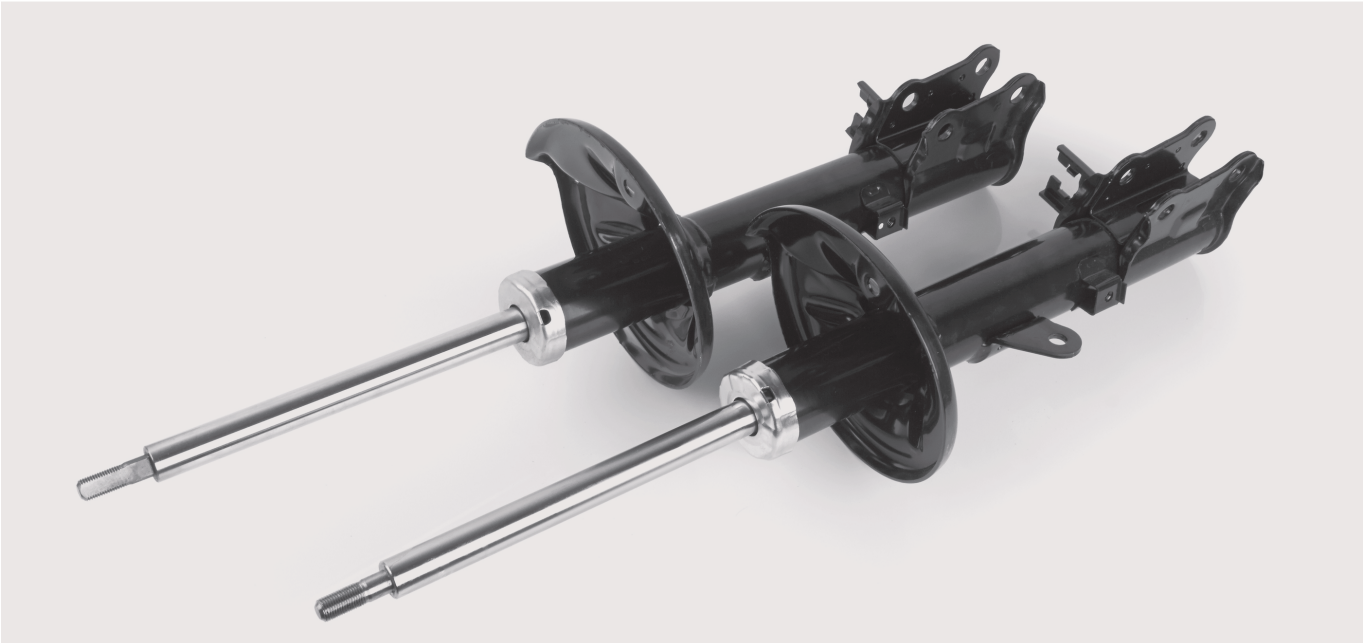
The material used to manufacture this component is an elongated or elongated + turned SAE1040 with diameters between 15 and 30 mm, which shall ensure a minimum limit of elasticity of around 600 MPa.

The manufacturing process of the rod includes induction hardening, which ensures a minimum hardness on its back side and, thus, reduces the appearance of marks or shocks from handling, which would negatively affect the chrome-planting and, therefore, the sealing of the component.

Sidenor has developed two pre-treated special steel qualities where induction hardening is not necessary anymore, as the same levels of hardness suitable for chrome-plating are reached.

For diameters under 18 mm, Sidenor presents its DUCTIL, which is based on highly formable tetragonal martensite and can be elongated and turned. And for diameters over 18 mm, Sidenor presents Micro 900 which, with its perlite ferrite structure and controlled micro-precipitation hardening, achieves the same results.

Both qualities underwent testing under industrial conditions and showed excellent results regarding all required rod properties: machinability, hardness after grinding, roughness after grinding, suitability for chroming, roughness after chrome-plating, micro-hardness, chrome thickness, risk of cracks, bending, corrosion in saline mist...



To conclude, both qualities presented by Sidenor meet the needs of the shock absorber rod, while providing cost savings related to the elimination of induction hardening.

Besides, the previous hardening of both qualities enables a reducion in grinding costs, as the material will generate less marks or shocks.