

Induction hardened chromium plated bars

When to use them

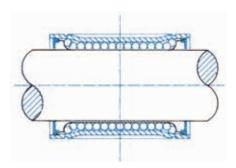
When the specific pressure in service is very high or there is a risk to damage the chromium plated surface by shocks or abrasions, it is advisable to use the induction hardened chromium plated bars. In this case the chromium overlay receives a better support by the hardened base material and is, therefore, less delicate.

Which one to choose

For the piston rod of a hydraulic cylinder, a hardness of 54-55 HRC (HV 577-613) for the surface lying under the chromium overlay is enough.

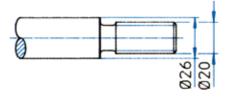
These hardness values are reachable with steel grades like UNI C43 or DIN Ck45.

In case of very high specific pressure as the one met with ball bearing systems like Ball Bushing, it is necessary that the hardness reaches 60 HRC (HV 697). In this case a steel grade like UNI C50, which gives HV 700-750, has to be chosen. For rods subjected to high mechanical stresses and for which the impact strength is important, the quenched and tempered steel grade 42CrMo4 (SAE 4140) induction hardened, is requested.



How to machine them

Use ceramic inserts for turning; with these inserts the induction hardened and chromium plated skin should be eliminated in one pass. Do not use lubrication even if the high temperature generates dull red turnings, the thermal shock could destroy the inserts. Once the induction hardened layer is eliminated, the machining can be completed with conventional tools and cooling.



In the components design, the section reduction on the machined areas should always be big enough not to involve the hardened layer; the threads in particular must not be located inside the induction hardened layer.

Steel grade	Steel hardness	
	HRC	HV
UNI C45	53,2 - 60	580 - 660
UNI C50	56 - 64	700 - 750
42 CD4	55,2 - 61,9	620 - 750
20Mn V6	42 - 48	410 - 485
38Mn V6	46 - 54	455 - 580