

#### General product description

The quenched and tempered steel 41Cr4 or 41CrS4 is a versatile material mainly used in the automotive industry. 41Cr4 is used for components that do not require as high strength as components made of the quenched and tempered steel 42CrMo4. It is used for components such as gears, bevel and ring gears, axles, and tools.

#### Individual bar hardening - homogeneity makes the difference

Compared to conventionally heat-treated products, the microstructure, strength, toughness, straightness, and residual stress state are significantly improved after single bar quenching. Additionally, this process operates with low decarburization and scale formation and drastically reduces hardness deviations. The dimension range for single bar quenching is  $\varnothing$  15-80 mm.

#### International designation

Steel number	EU/DE	ASTM	JIS	AFNOR	B.S.	AISI
1.7035	41Cr4		SCR440	42C4	530M40	
1.7039	41CrS4	-	SCR440H	42C4u	530H40 EN18 EN18D	-

#### Chemical composition (cast analysis by mass-%)

Element	C	Si	Mn	P	S	Cr
min.	0,38	0,10	0,60	-	(0,020)	0,90
max.	0,45	0,40	0,90	0,025	0,035 (0,040)	1,20

Deviation of piece analysis from melt analysis according to DIN EN 683-2:2018 Table 4.  
Customized analyses are possible upon consultation.

#### Mechanical-technological properties

Characteristic d [mm]	R <sub>p0,2</sub> [MPa]	R <sub>m</sub> [MPa]	A <sub>5</sub> [%]	KV <sub>RT</sub> [J]
16 < d ≤ 40	660	900 – 1100	12	35
40 < d ≤ 63	560	800 – 950	14	35
40 < d ≤ 100	560	800 – 950	14	35

In accordance with DIN EN 10277:2018,  
customized mechanical properties and other dimensions are possible upon consultation..

#### Dynamic properties

41Cr4 +HH +QT +SH	Bending fatigue strength $\sigma_{bw}$ [MPa]	Tensile strength $R_m$ [MPa]
Ø 27 mm	540	1090

Smooth samples from the core

#### Physical properties

properties	approx. value
Density in kg/dm <sup>3</sup>	7,72
E-Module in GPa	210
Electrical resistance at 20 °C in $\Omega$ mm <sup>2</sup> /m	0,19
Thermal conductivity at 20 °C in W / (m K)	42,6
Specific heat capacity at 20 °C in J / (kg K)	470

#### Microstructure

Surface hardness minimum 53 HRC according to EN ISO 683-2:2018. The microscopic oxide purity grade according to DIN 50602 can be agreed upon. The grain size according to ASTM E 112 is > 5.

#### Condition of delivery

Peeled, quenched, and tempered bright steel.

#### Miscellaneous

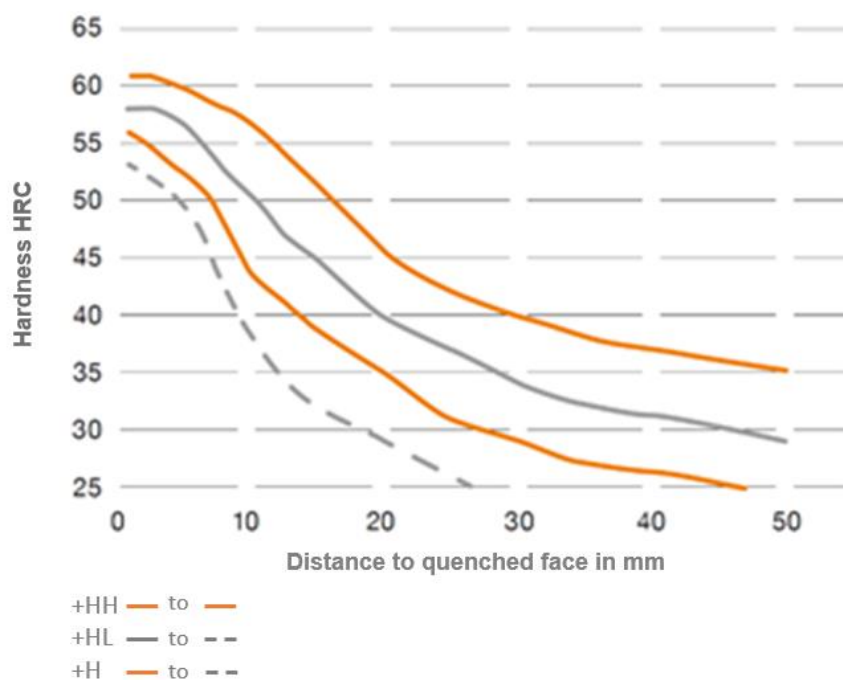
Other agreements according to order.

#### Surface finish

The surface condition complies with the requirements of EN 10277. Ultrasonic volumetric testing is possible. In the standard version, the rod ends up to 50 mm are not tested.

#### Hardenability

42CrMo(S)4



Without further specifications, we use the quality +HH according to DIN EN 683-2:2018.

For further info on our product range of tool steel, stainless steel and Engineering steel please visit [www.swisssteelgroup.com](http://www.swisssteelgroup.com)

30.06.23 Rev. N°1

Discover our Green Steel portfolio on [www.swissgreensteel.com](http://www.swissgreensteel.com)

The information and data contained in this document represent standard or average values and do not constitute a warranty or guarantee of minimum or maximum values. The information contained in our material test certificates is solely authoritative. Application recommendations for the materials described in this document are provided for guidance only to enable the reader to make their own decisions and do not constitute an express or implied warranty or guarantee that a material is suitable for a particular application.

Subject to change, errors and printing mistakes. The desired performance characteristics are only binding if they are exclusively agreed upon at the time of contract conclusion.

**Swiss Steel Group**  
 Steeltec AG / Steeltec GmbH:  
 Emmenbrücke / Düsseldorf / Gebze  
[info.engineering@swisssteelgroup.com](mailto:info.engineering@swisssteelgroup.com)