Material data sheet
Steel grade

Last revised: Thu, 23 Feb 2023 16:19:48 GMT

OVAKO

41Cr4 All

General Information

41Cr4 is a steel for quenching and tempering recommended for components with strength requirements lower than the steel 42CrMo4. It is suitable for induction surface hardening, min hardness 52 HRC. It through hardens in oil up to appr. 40 mm diameter.

For additional Heat Treatment Data, please visit the Heat Treatment Guide

Similar designations

41CrS4, SS2245, 530M40, 530H40, EN18, SCR440, 42C4, 1.7035, 1.7039

Chemical composition

Variant	Cast	Di		C%	Si%	Mn%	P%	S%	Cr%
5515	CC	4.4	Min	0.38	-	0.60	-	0.020	0.90
			Max	0.45	0.40	0.90	0.025	0.035	1.20

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A_5 [%]	Reduction of area Z_{min} [%]	Hardness	Impact (ISO-V) $strength_{min}$
5515	+A	Round bar	20 < 160	-	-	-	-	< 241 HB	-
	+QT	Round bar	20 < 40	660*	900-1100	12	35	-	20 °C 35 J (long)
		Round bar	40.1 < 100	560*	800-950	14	40	-	20 °C 35 J (long)

$Rp_{0.2}$ * R_{eh}, ** R_{el}

Transformation temperatures

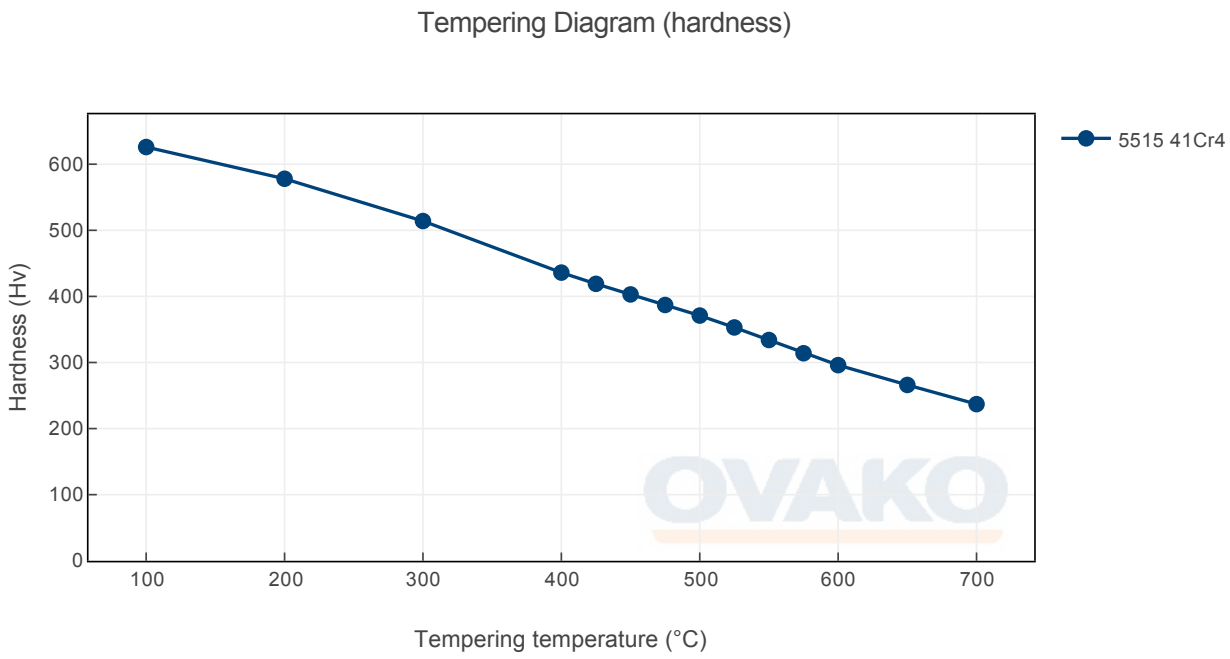
	Temperature °C
MS	320
AC1	735
AC3	790

Heat treatment recommendations

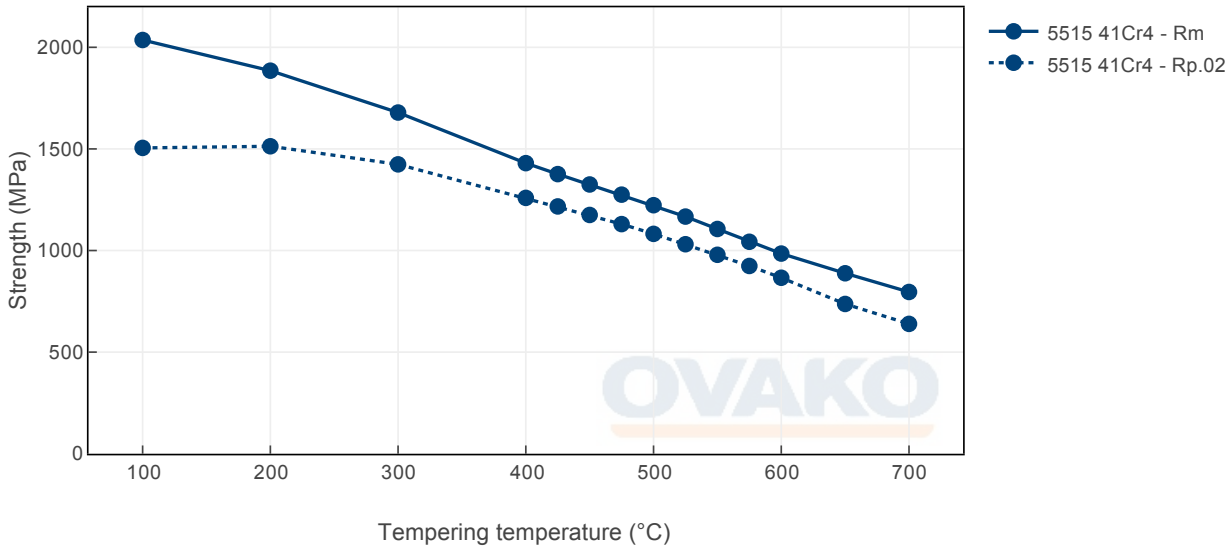
Treatment	Condition	Temperature cycle	Cooling/quenching
Soft annealing	+A	670- 710ºC	In air
Quench & Tempering	+QT	Austenizing 830 - 860ºC Tempering 540 - 680ºC	Water or oil

Heat Treatment Guide generated Graphs

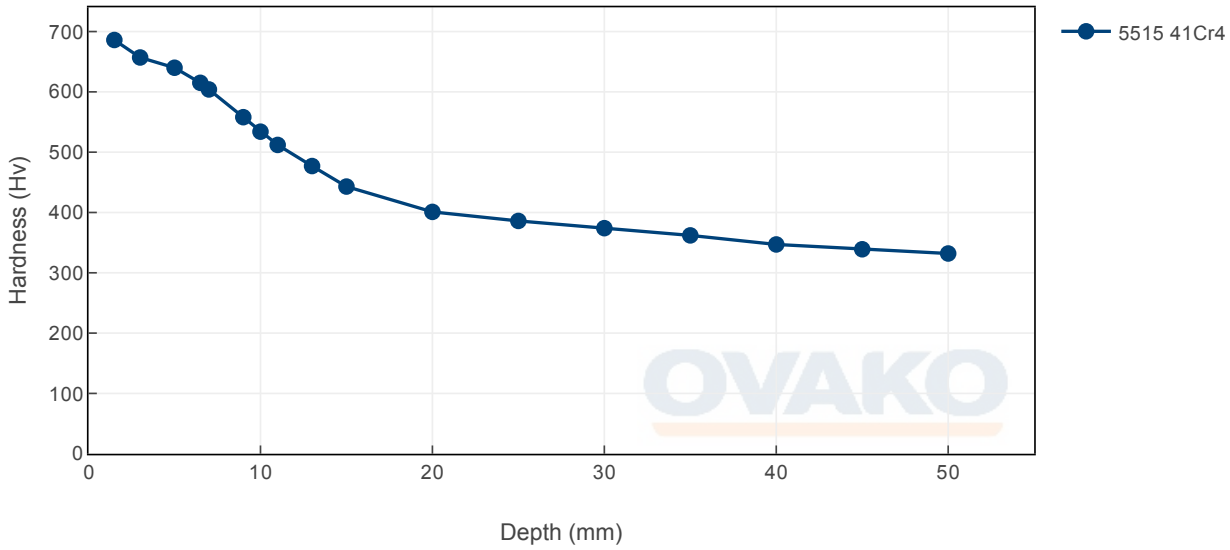
The following graphs are generated from a theoretical model. For further info see the Heat treatment guide module. Select a specific grade version for individual display.

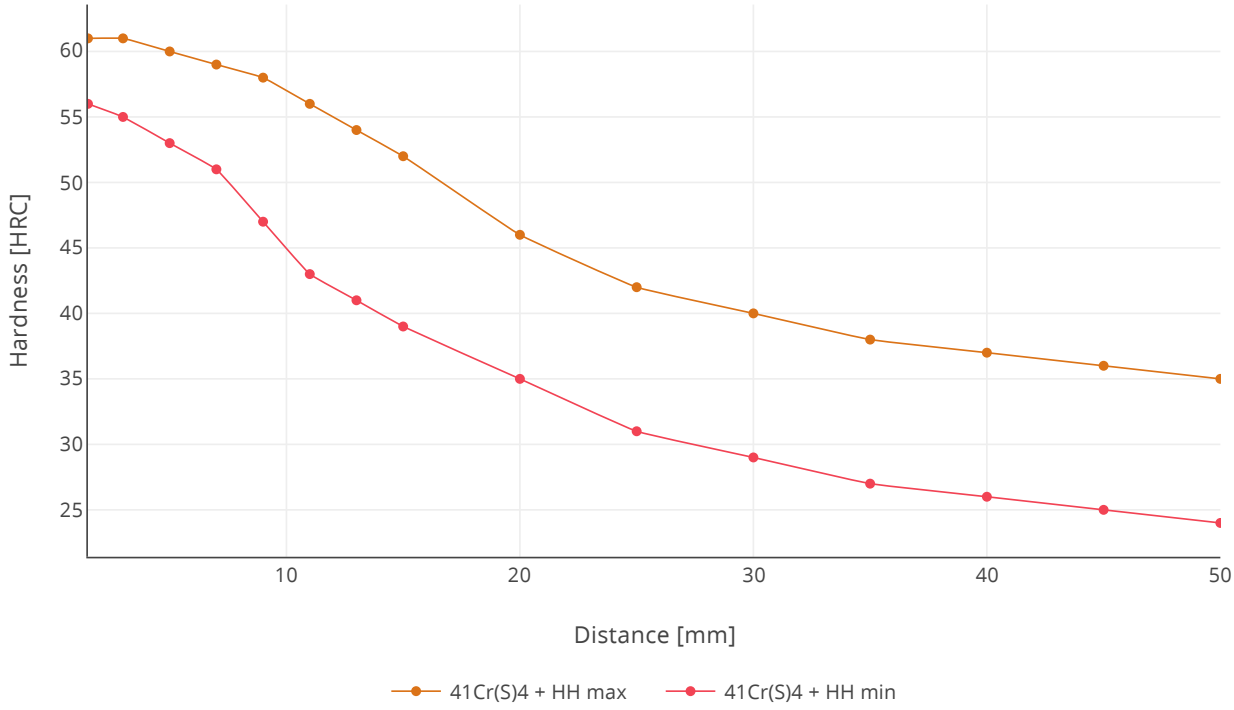


Tempering Diagram (strength)



Jominy


Hardness (Hv)
700
600
500
400
300
200
100
0
0
10
20
30
40
50
Depth (mm)
5515 41Cr4



SUSTAINABILITY-ENVIRONMENTAL IMPACT DATA

At Ovako sustainability and reduction of our environmental impact is a major focus in everything we do.
Further information is found here.

In many international comparisons the crude steel Scope 1-2 emission is a key parameter, ie. the CO_2 emission from the steel works itself.
As of 1 January 2022 we carbon offset all our scope 1 and 2 volume shown below.

Steel works	Hofors	Smedjebacken	Imatra
CO2e/kg	120	62	76

To get the full picture of our products environmental impact we have to look at all of our CO_2 emission sources. Not only the steel work Scope 1-2 itself, but all operations downstream in our production, heating and heat treatment furnaces etc (full scope 1-2) as well as all the emission from input material, eg. alloys, scope 3.

Steel Grade	Format	Condition	Scope 1-3 (CO2e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO2e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
5515	Round bar	+AR	517	233
5515	Round bar	+QT	768	280

As of 1 January 2022 we use carbon offset for all our scope 1- 2 emissions, so in practice the climate compensated data is the same as the full Scope 3 level.
All above data are to be seen as typical values for the specified format and condition. Detailed information about your specific product please contact your sales contact.

Other properties (typical values)

Youngs module (GPa)	Poisson´s ratio (-)	Shear module (GPa)	Density (kg/m3)
210	0.3	80	7800
Average CTE 20-300°C (µm/m°K)	Specific heat capacity 50/100°C (J/kg°K)	Thermal conductivity Ambient temperature (W/m°K)	Electrical resistivityAmbient temperature (µΩm)
12	460 - 480	40 - 45	0.20 - 0.25

Contact us

Would you like to know more about our offers? Don´t hesitate to contact us:

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For more detailed information please visit http://www.ovako.com/en/Contact-Ovako/