

31CrMoV9 All

General Information

31CrMoV9 is a steel which in general is intended for the fabrication of quenched and tempered parts, which are generally machined and subsequently nitrided.

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

Similar designations

30CrMoV9, 1.8519

Chemical composition

Variant	Cast	Di		C%	Si %	Mn %	P %	S %	Cr%	Mo %	V %
6140	CC	8.26	Min	0.27	0.10	0.40	-	0.010	2.30	0.15	0.100
			Max	0.34	0.40	0.70	0.025	0.035	2.70	0.25	0.200
EN 10085	Std		Min	0.27	-	0.40	-	-	2.30	0.15	0.100
			Max	0.34	0.40	0.70	0.025	0.035	2.70	0.25	0.200

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A ₅ [%]	Hardness	Impact (ISO-V) strength _{min}
6140	+AR	Round bar	25 < 150	-	-	-	< 420 HB	-
	+QT	Round bar	25 < 40	900*	1100-1300	9	-	20 °C 25 J (long)
		Round bar	40 < 100	800*	1000-1200	10	-	20 °C 30 J (long)
		Round bar	100 < 150	700*	900-1100	11	-	20 °C 35 J (long)

$R_{p0.2}$ * R_{eh} , ** R_{el}

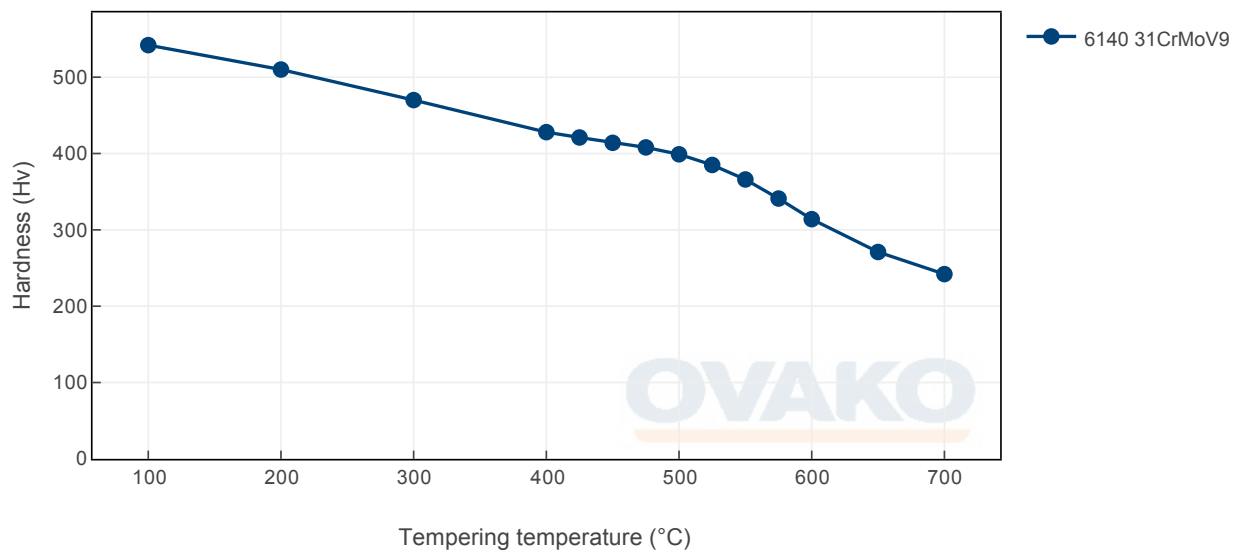
Transformation temperatures

	Temperature °C
MS	341
AC1	755
AC3	815

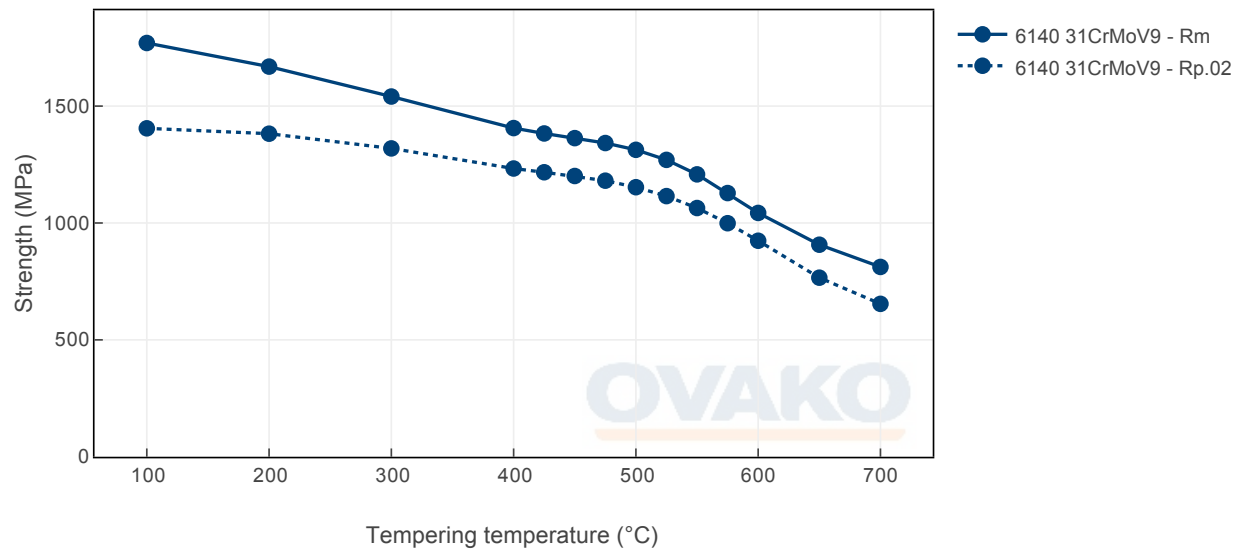
Heat Treatment Guide generated Graphs

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.

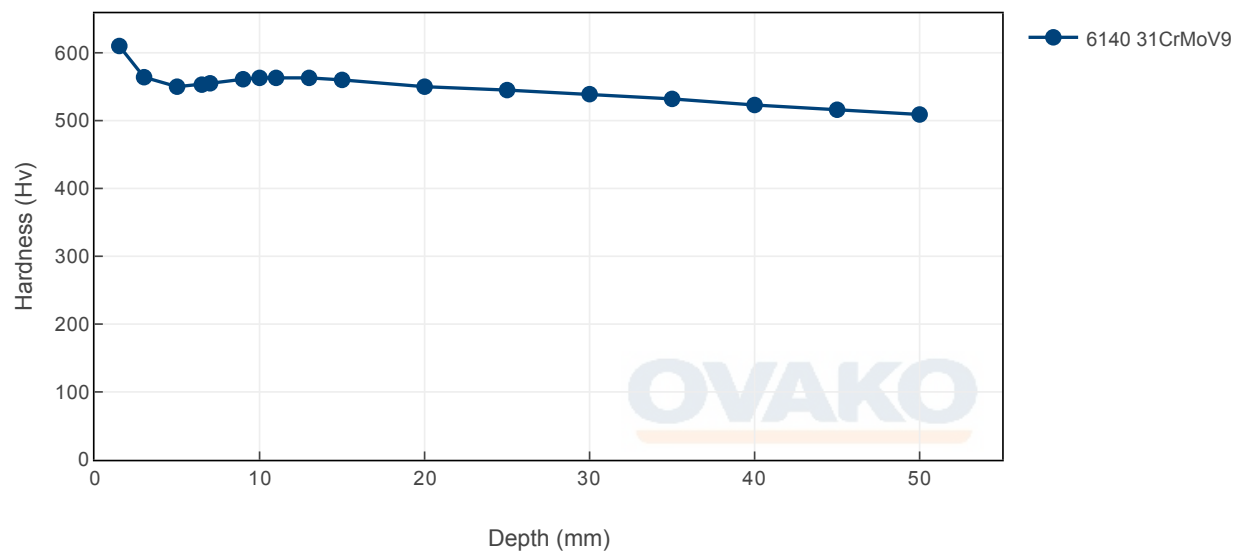
Tempering Diagram (hardness)



Tempering Diagram (strength)



Jominy



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 CO₂ 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
CO ₂ e/kg	120	62	76

To get the full picture of our products environmental impact we have to look at all of our CO₂ 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 (CO ₂ e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO ₂ e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
6140	Round bar	+AR	546	262
6140	Round bar	+QT	803	315

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/m ³)
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 resistivity Ambient 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:

Via e-mail: info@ovako.com

Via telephone: +46 8 622 1300

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

Disclaimer

The information in this document is for illustrative purposes only. The data and examples are only general recommendations and not a warranty or a guarantee. The suitability of a product for a specific application can be confirmed only by Ovako once given the actual conditions. The purchaser of an Ovako product has the responsibility to ascertain and control the applicability of the products before using them. Continuous development may necessitate changes in technical data without notice. This document is only valid for Ovako material. Other material, covering the same international specifications, does not necessarily comply with the properties presented in this document.