

# 12NiCrMo13-6\* All

## General Information

12NiCrMo13-6\* or 9313 as it is also named in US standards is a case hardening steel used in forgings to eg rock drilling tools.

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

*\* Designation followed by "\*" is not an official EN standard grade but named according to the rules in EN 10027.*

## Similar designations

AISI 9313

## Chemical composition

Variant	Cast	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	Cu %
254R	IC	CEV 0.8 <sub>max</sub>	Min	0.11	0.20	0.65	-	-	1.40	3.15	0.10	-
		Pcm 0.33 <sub>max</sub>	Max	0.15	0.26	0.75	0.010	0.015	1.50	3.35	0.14	0.25
4708	CC	CEV 0.76 <sub>max</sub>	Min	0.11	0.20	0.60	-	-	1.35	3.15	0.10	-
		Pcm 0.3 <sub>max</sub>	Max	0.14	0.35	0.70	0.015	0.015	1.45	3.35	0.14	0.25

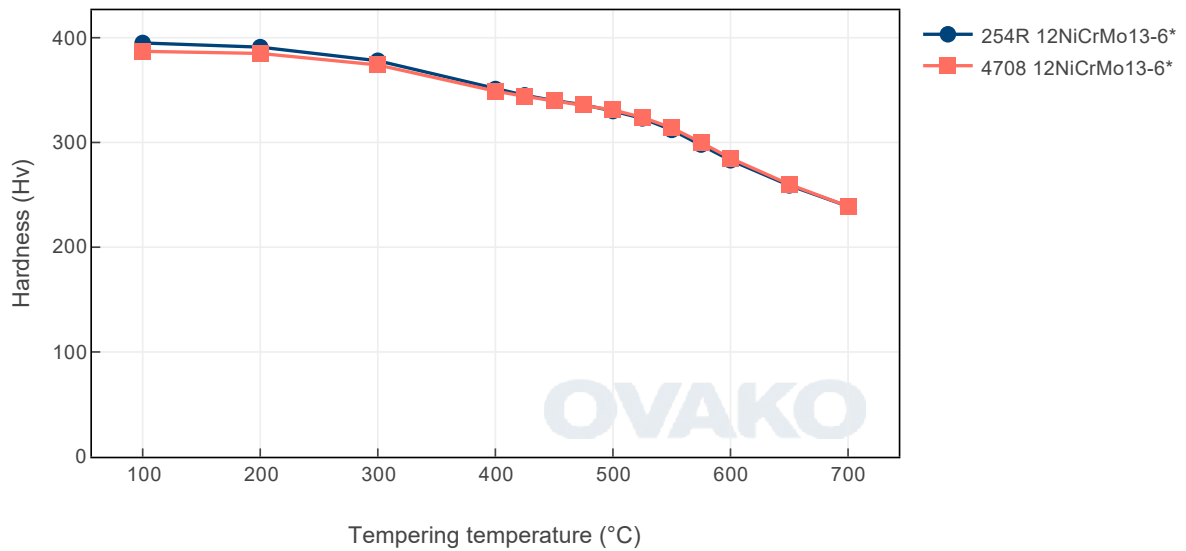
## Transformation temperatures

	Temperature °C
MS	386
AC1	693
AC3	806

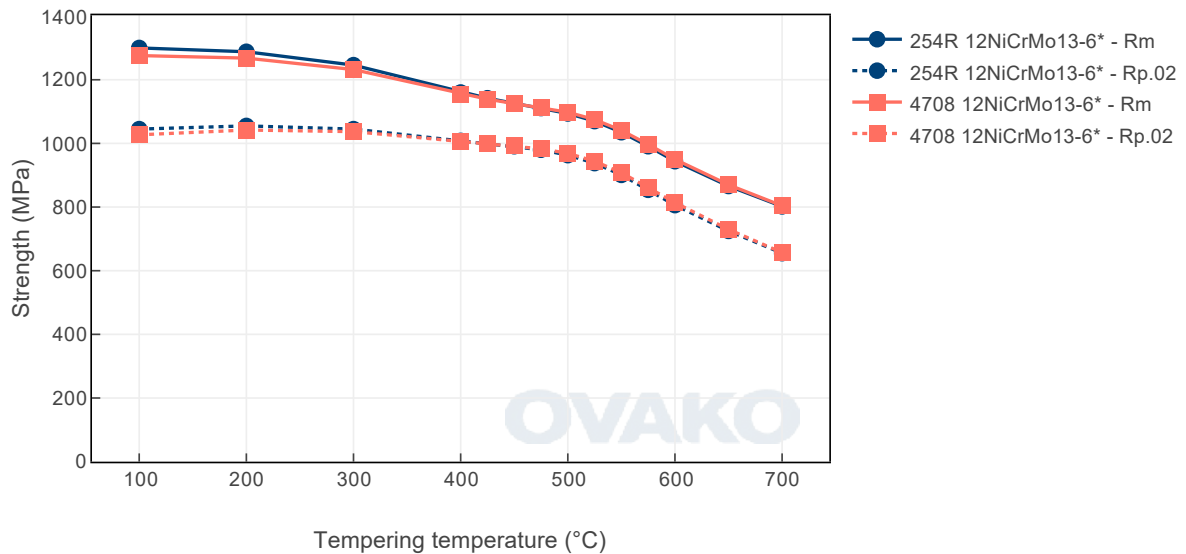
## Heat Treatment Guide generated Graphs

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.

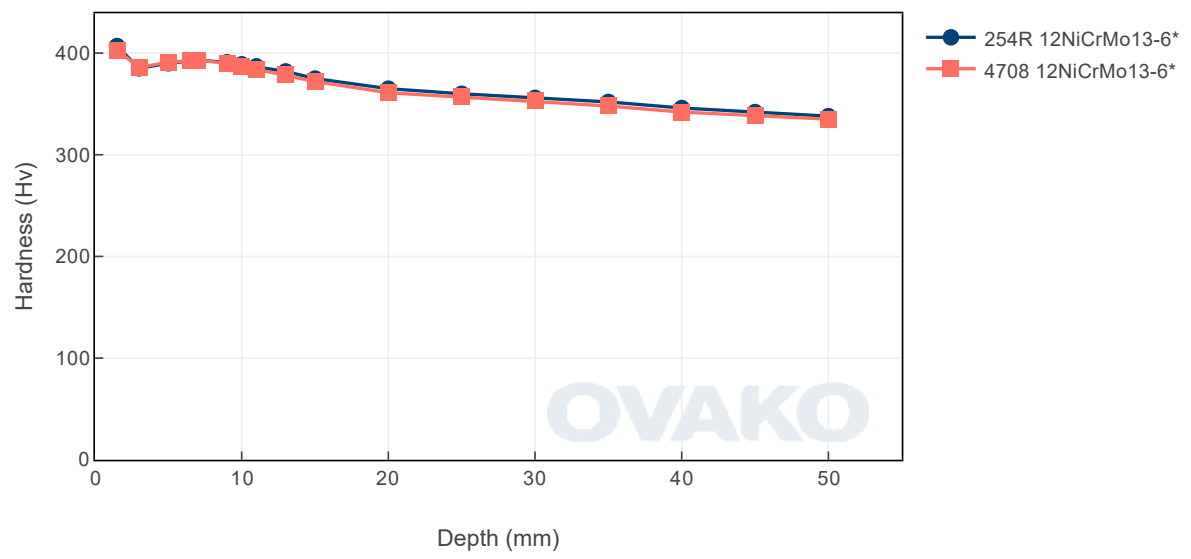
Tempering Diagram (hardness)



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 CO<sub>2</sub> 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 <sub>2</sub> e/kg	120	62	76

To get the full picture of our products environmental impact we have to look at all of our CO<sub>2</sub> 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 <sub>2</sub> e kg /1000 kg steel)	Climate compensated Net emission = Scope 3 (CO <sub>2</sub> e kg /1000 kg steel) Scope 1 - 2 = 0 (compensated)
254R	Round bar	+AR	1175	779
254R	Round bar	+A	1188	783
254R	Tube,wall	+AR	1231	829
254R	Tube,wall	+A	1234	829
4708	Round bar	+AR	1031	729

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 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:

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Via telephone: +46 8 622 1300

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

### Disclaimer

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