MATERIAL DATA SHEET

STEEL GRADE

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OVAKO

20NiCrMoS2-2 All

General Information

Alloyed case hardening steel for very high strained parts and good toughness at core tensile strength of 700 - 900 MPa. Driving bevel gears, crown wheels, gears, shafts, bolts for automotive and gear components. Suitable for direct hardening.

M-Steel®

The basis for the concept is that non-metallic inclusions are modified and controlled with calcium treatment in a way to minimize tool wear and to maximize chip control in machining operations. Our M-Steel treatment can be applied to any steel grade.

Similar designations

20NiCrMo2-2, MoCN206 M, SAE 8620, BS 805H22, 20NCD2, SS2506

Chemical composition

Variant	Cast	Di	Weldability		C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %
4532	CC	2.3	CEV 0.55_{max}	Min	0.17	0.10	0.60	0.000	0.000	0.35	0.35	0.15
			Pcm 0.32_{max}	Max	0.23	0.25	0.95	0.025	0.025	0.70	0.75	0.25
4542	CC	2.4	CEV 0.581_{max}	Min	0.17	0.15	0.60	0.000	0.025	0.35	0.35	0.15
			Pcm 0.36_{max}	Max	0.23	0.35	0.95	0.035	0.035	0.70	0.75	0.25
4548, MoCN 206 M	CC		CEV 0.581_{max}	Min	0.17	-	0.65	0.000	0.025	0.35	0.40	0.15
			Pcm 0.36_{max}	Max	0.23	0.40	0.95	0.025	0.035	0.70	0.70	0.25

Mechanical Properties

Variant	Condition	Format	Dimension [mm]	Hardness
4532	+AR	Round bar	25 < 160	< 215 HB
	+U	Round bar	< 160	< 230 HB
	+A	Round bar	< 160	< 212 HB
	+QT	Round bar	16 < 40	> 245 HB
4542	+A	Round bar	< 160	< 212 HB
	+U	Round bar	< 160	< 230 HB
	+QT	Round bar	16 < 40	> 245 HB
4548, MoCN 206 M	+A	Round bar	< 160	< 212 HB
	+U	Round bar	< 160	< 230 HB

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

Transformation temperatures

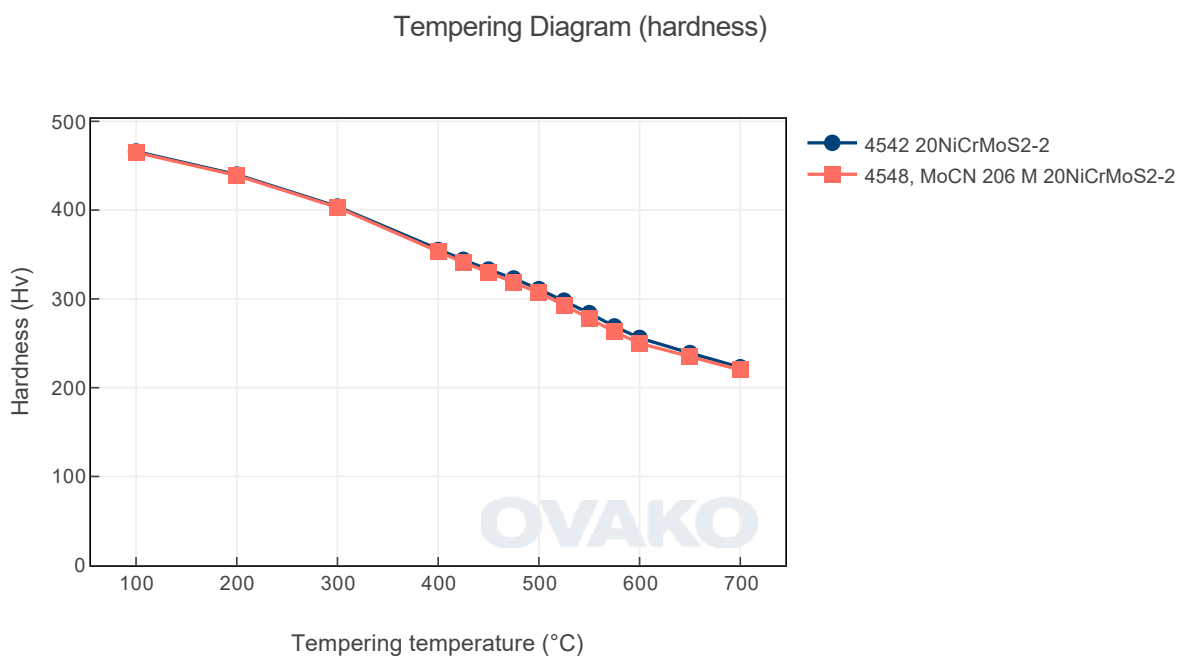
	Temperature °C
MS	400
AC1	723
AC3	827

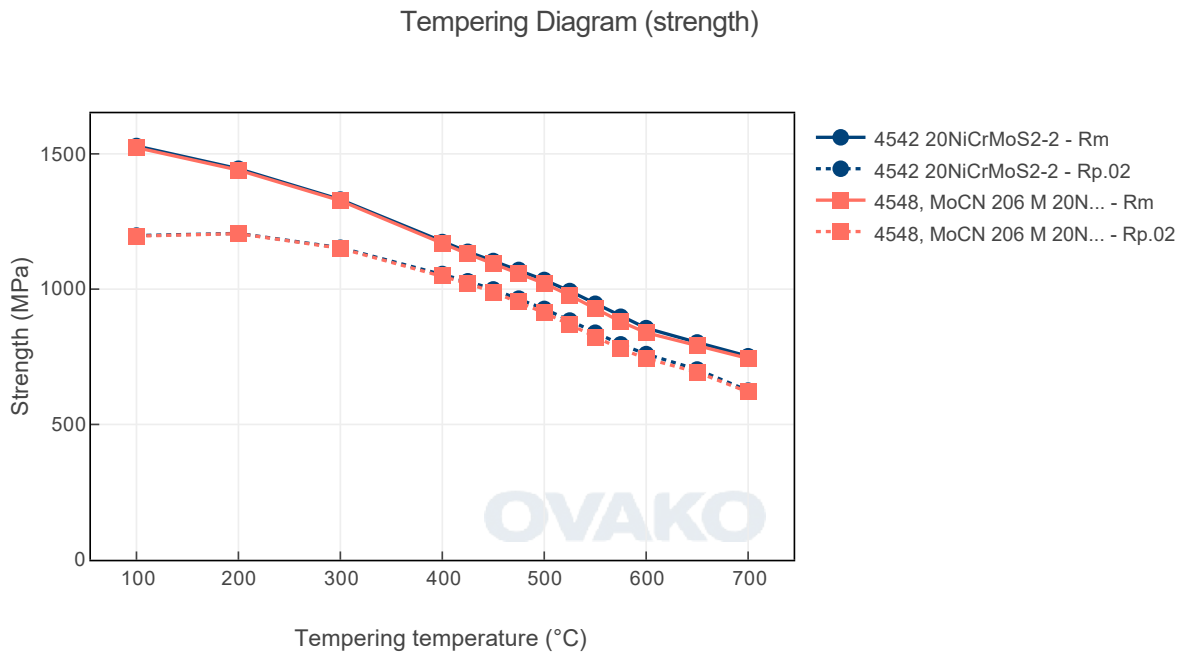
Heat treatment recommendations

Treatment	Condition	Temperature cycle	Cooling/quenching
Hot forging	+U	800-1200°C	In air
Normalizing	+N	860-890	In Air
Soft annealing	+SA	600-670 °C 2h	In Air
Carburizing	+C	850-900°C	

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)
Strength (MPa)
1500
1000
500
0
100
200
300
400
500
600
700
Tempering temperature (°C)
4542 20NiCrMoS2-2 - Rm
4542 20NiCrMoS2-2 - Rp.02
4548, MoCN 206 M 20N... - Rm
4548, MoCN 206 M 20N... - Rp.02
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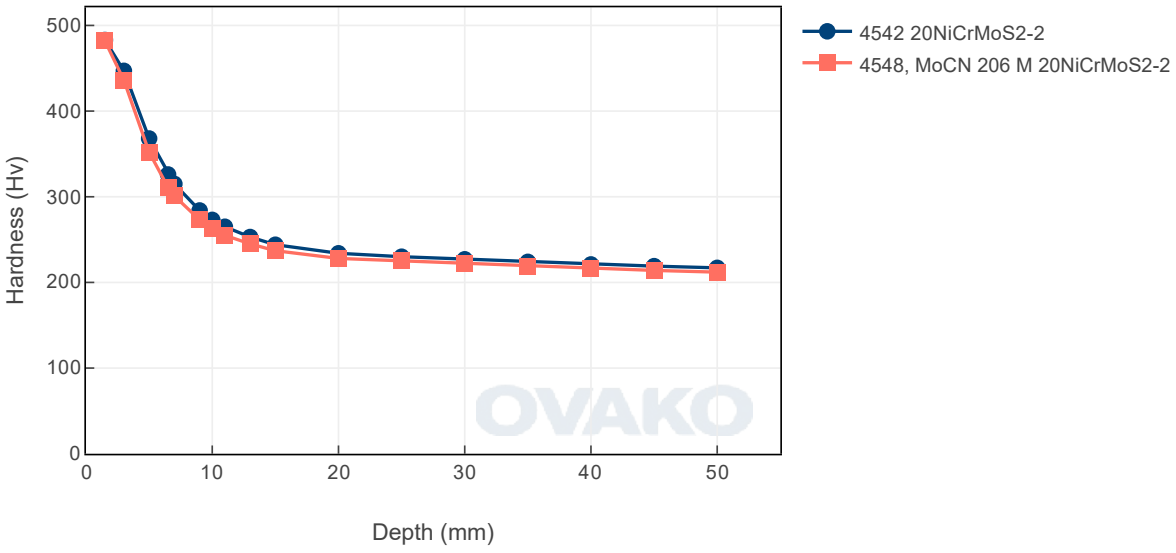
Hardness (Hv)
500
400
300
200
100
0
0
10
20
30
40
50
Depth (mm)
4542 20NiCrMoS2-2
4548, MoCN 206 M 20NiCrMoS2-2
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Other properties (typical values)

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:

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/

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