MATERIAL DATA SHEET STEEL GRADE

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42NiSiCrMo8-7-3* A

General Information

Ovako 497Q is an ingot cast high tensile quench and tempering steel with very high strength and toughness. Ovako 497Q is an excellent choice for shafts and machine components. The high silicon content will give an improved tempering resistance. The grade is produced with the quality class IQ (isotropic quality). This ensures a very low number of elongated sulphide inclusions which will give more isotropic properties. The high oxidic cleanliness will enable the steel to meet the same high demands as for remelted qualities. The carbon range will give a high surface hardness after surface induction hardening.

OVAKO

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

IQ-Steel®

IQ-Steel® is an isotropic quality ultra clean steel optimized for high fatigue strength under multi axial loading.

Similar designations

UNS K 44220, AMS 6417, AMS 6419, ASTM/SAE 300M

Chemical composition

Variant	Cast	Weldability		С%	Si %	Mn %	Р%	S %	Cr %	Ni %	Mo %	V %
497Q		CEV 1.03 _{max}	Min	0.39	1.50	0.60	-	-	0.70	1.65	0.30	0.060
		Pcm 0.68 _{max}	Max	0.44	1.80	0.90	0.015	0.001	0.95	2.00	0.45	0.100

Mechanical Properties

Variant	Condition	Format	Yield strength min [MPa]	Tensile strength [MPa]	Elongation A ₅ [%]	Hardness
497Q	+SA	All formats	-	-	-	220 HB typical
	+QT	All formats	1550	2100 typical	8	53 HRC typical

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

Transformation temperatures

Temperature °C			
MS	304		
AC1	744		
AC3	835		

Heat treatment recommendations

Treatment	G Condition	Temperature cycle	Cooling/quenching
Soft annealing	+SA	RT-820°C 1h, 820°C 2h, 820-740°C 1h, 740-690°C 14h	In air
Hot forging	+AR	900-1200°C	In air
Quenching	+QT	Austenitization 860-880°C 1h	In oil
Tempering	+QT	200-650°C Double tempering is recommended, see tempering diagram	In air

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



Steel cleanliness

Micro inclusions - IQ			Macro inclusions	- IQ
Applied standard	DIN 50602 K1			10 M Hz UST (Ovako internal standard)
Sampling	Six random samples from final product dimension		Sampling	Statistical testing on billets
Limits	The limit is dimension dependent. The average rating of six samples should not exceed the limits given in the graph		Limits	< 5 defects/dm3 > 0,2 mm FBH

IQ





Tempering response - Ovako 497



Tempering response 2h tempering. Hardening 870°C 45min +



Impact toughness - Ovako 497

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.

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 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	G 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)
497Q	Round bar	+AR	917	518
497Q	Round bar	+SA	924	523
497Q	Tube,wall	+AR	966	569
497Q	Tube,wall	+SA	969	571

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/

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