Technical Datasheet
Q&T Steel
42CrMo(S)4 XTP®

General product description

The compensation steel 42CrMo(S)4 can be adjusted to individual processing and component requirements using Xtreme Performance Technology. The 42CrMo(S)4 XTP® is suitable for components that are subjected to the highest mechanical loads.

International description

Steel number	EU/DE	ASTM		AFNOR	B.S.	AISI
					708M40	
					709M40	
					708A42	
					708H37	
		A331	1	40CD4	EN19	
		A505	1H	42CD4	EN19A	
1.7225	42CrMo4	A519	140	40CD4u	EN19B	4137
1.7727	42CrMoS4	A640	140H	42CD4u	EN19C	4140

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Chemical composition (cast analysis in percentage by mass)

Element	C	Si	Mn	P	S	Cr	Mo
min.	0,38	0,10	0,60	–	0,020 / –	0,90	0,15
max.	0,45	0,40	0,90	0,025	0,040 / 0,035	1,20	0,30

The analysis corresponds to 42CrMoS4 / 42CrMo4 (1.7227 / 1.7225) according to DIN EN ISO 683-2.
Customized chemical analyses are possible upon consultation.

Mechanical-technological properties

Strength class	$R_{p0,2}$ [MPa]	R_m [MPa]	A_5 [%]	Z [%]	KV_{RT} [J]	T_{27}
1	>850	1000–1200	≥14	≥55	≥70	-50
2	>1050	1200–1400	≥11	≥50	≥45	-20
3	>1250	1400–1600	≥10	≥45	≥15	
4	>1450	1600–1800	≥ 8	≥40	≥10	

Typical mechanical-technological properties:
$R_{p0.2}$ = 0.2% yield strength, R_m = tensile strength, A_5 = elongation at fracture,
A_g = uniform elongation, Z = reduction of area,
KV = Charpy impact strength according to DIN EN ISO 148-1, RT = room temperature,
T = temperature, T_{27} = transition temperature of the Charpy impact strength at 27 J.

Dynamic properties

42CrMo4 XTP®	Bending fatigue strength σ_{bw} [MPa]	Tensile strength R_m [MPa]
Ø 32 mm	697	1587

Smooth samples from the core

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Carbon equivalent

Max. CET (CEV)	0,64 (0,93)
Typ. CET (CEV)	0,58 (0,83)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Microstructure

Minimum 90% quenched and tempered microstructure for the grade 42CrMo(S)4 +HH. Surface hardness minimum 53 HRC according to DIN EN ISO 683-2. The microscopic oxidic purity grade according to DIN 50602 can be agreed upon. The grain size according to ASTM E 112 is ≥9.

Surface properties

The surface condition complies with the requirements of SN EN 10277. The bars are crack-tested according to surface quality class 3 as standard. In the standard version, the ends of the bars up to 50 mm are not tested.

Miscellaneous

Other agreements according to order.

Condition of delivery

- Round bars, XTP®-treated
- Dimension range 18 - 40 mm
- Delivery lengths up to 8,000 mm
- Tolerance h11 and bar straightness 0.5 mm/m according to DIN EN 10278

Fabrication and other recommendations

- Comparatively good machinability
- Bendable
- Thread rolling and cutting possible

Your benefits at a glance

Increased durability

- Higher load capacity and component safety
- Longer service life and lower maintenance costs
- Potential for lightweight construction

Increased productivity

- Reduced distortion and increased straightness
- Optimized diameter tolerance

Highest quality

- Single bar processing
- State-of-the-art process control
- Low decarburization and low scale formation

For further info on our product range of tool steel, stainless steel and Engineering steel please visit www.swisssteelgroup.com

Discover our Green Steel portfolio on www.swissgreensteel.com

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