

MATERIAL NUMBER 1.8509 · CLASS 1.8

38CrMoAl

Material no. 1.8509

also listed as 41CrAlMo7

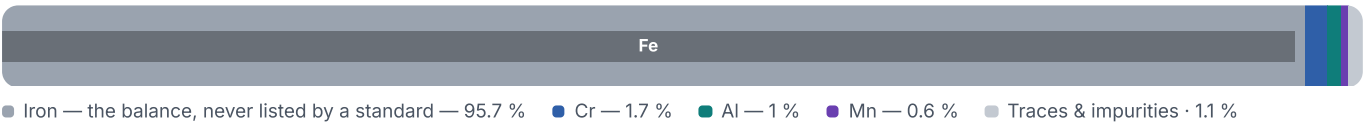
Chemical composition, mechanical and physical property values, and 44 standard designations from 16 regions.

DENSITY 7.57 g/cm³	OTHER DESIGNATIONS 44 in 16 regions	PROPERTY VALUES 15 on file
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Chemical composition

Mass fraction in %

What this alloy is



Logarithmic scale, 0.01 % to 100 % — every value here compares directly, decade by decade.



The scale is logarithmic, not the element's raw share of the alloy — the only honest way to fit 0.01 % and 100 % in one picture, and it means every value here can be compared with every other.

Predicted transformation temperatures

Not enough recorded composition to predict a transformation temperature for this grade — missing: Ni.

Mechanical properties

18 values across 4 conditions

QUENCHED AND TEMPERED			RM N/mm ²	A %		
16 – 40			950–1150	11		
40 – 100			900–1100	13		
100 – 160			850–1050	14		
160 – 250			800–1000	15		
CONDITION · DIMENSION		RM N/mm ²	A5 %	HB		
Pipe, GOST 21729-76		392	20	–		
38Kh2MYuA (38X2MЮA) (annealing) , GOST 4543-71		–	–	229		
38Kh2MYuA (38X2MЮA) (cold- worked) , GOST 4543-71		–	–	255		
SOFT ANNEALED				HB		
Soft annealed				248		
QUENCHING AND DRAWING		RM N/mm ²	RE N/mm ²	A5 %	Z %	KCU kJ/m ²
Ø 30		980	835	14	50	880

Physical properties

7 values

CONDITION · DIMENSION	RHO g/cm ³	E GPa	ALPHA 10 ⁻⁶ /K	LAMBDA W/(m·K)	CP J/(kg·K)
20	7.71	209	–	33	–
100	–	202	11.5	33	496
200	–	194	11.8	32	517
300	–	190	12.7	31	533
400	–	181	13.4	20	546
500	–	174	13.9	20	575
600	–	162	14.7	28	609
700	–	147	14.9	27	638
800	–	137	–	27	676
PROPERTY	VALUE		UNIT		
Density	7.57		g/cm ³		
Transformation point Ac1	800		°C		

PROPERTY	VALUE	UNIT
Transformation point Ac3	940	°C
Transformation point Ar1	730	°C

Technological properties

PROPERTY	VALUE	UNIT
Weldability	is not used.	
Flake sensitivity	predisposed	
Temper brittleness	not predisposed	

Heat treatment

7 regimes

STEP	TEMPERATURE	MEDIUM
Nitriding	Temperature not stated	—
Soft annealing	Temperature not stated	—
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Tempering	Temperature not stated	—
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Tempering	Temperature not stated	—
source joins the operations with + / procedural order		
Annealing	Temperature not stated	—
Annealing	Temperature not stated	—
Tempering	Temperature not stated	—
Normalizing	Temperature not stated	—
Tempering	Temperature not stated	—
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Tempering	Temperature not stated	—
Quenching and tempering	Temperature not stated	—

Designations across standards

44 designations · 8 documented as identical

United States		10	France		3
E71400		uns	40CAD2		afnor
K24065		uns	40CAD6		afnor
K24728	This grade's own name	uns	40CAD612	This grade's own name	afnor
A290C1M		aisi-sae	United States / Aerospace2		
A355Cl.A		aisi-sae	6431		ams
Cl.A		aisi-sae	6470H	This grade's own name	ams
E71400		aisi-sae	Italy2		
J24056		aisi-sae	41CrAiMo7		uni
K24065		aisi-sae	41CrAlMo7		uni
K24728		aisi-sae	Sweden2		
Russia / CIS		7	2940		ss
38Ch2MJuA		gost	SIS 14 2940	This grade's own name	ss
38G2MF		gost	Japan1		
38GST		gost	SACM645		jis
38Kh2MYuA		gost	China1		
38KhNM		gost	38CrMoAl		gb
38X2MIOA		gost	Czechia1		
38XMIOA		gost	15340		csn
Spain		5	Slovakia1		
41CrAlMo7		une	15 340		stn
CrAlMo7		une	Poland1		
F.174		une	38HMJ		pn
F.1740		une	Serbia1		
F.1740-41		une	Č.4784		srps
Europe		3	South Korea1		
1.8509		din-en	SACM645		ks
41CrAlMo7	This grade's own name	din-en			
41CrAlMo7-10	This grade's own name	din-en			
United Kingdom		3			
41B		bs			
905M39	This grade's own name	bs			
EN 41 B	This grade's own name	bs			

Note on use. The data is compiled to the best of our knowledge from publicly available standards and manufacturer documentation. It replaces neither material testing nor an inspection document to EN 10204. Please request a mill certificate to EN 10204 2.1, 3.1 or 3.2 together with your enquiry. The standard in its current valid edition always prevails.

Enquiry about 38CrMoAl

Quotation, availability, mill certificate or a technical question — directly on the material page.

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ISSUED

Aug 20, 2026