SteelEquivalents.com

Material datasheet
As of Aug 23, 2026

MATERIAL NUMBER 1.4021 · CLASS 1.4

F.3402

Material no. 1.4021

also listed as X20Cr13

Chemical composition, mechanical and physical property values, and 56 standard designations from 17 regions.

DENSITY	ELASTIC MODULUS	OTHER DESIGNATIONS	PROPERTY VALUES
7.7 g/cm³	200 GPa	56 in 17 regions	18 on file

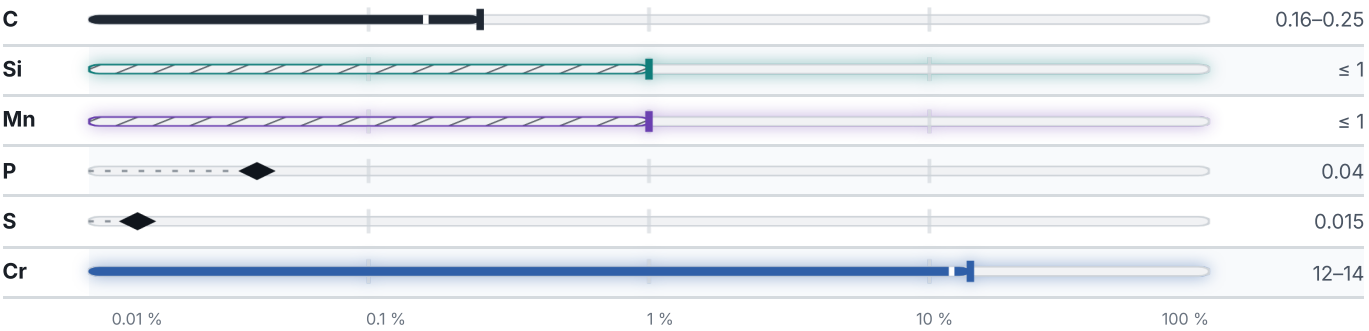
Chemical composition

Mass fraction in %

What this alloy is

Iron — the balance, never listed by a standard — 84.7 % · Cr — 13 % · Si — 1 % · Mn — 1 % · Traces & impurities · 0.3 %

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, Mo.

Mechanical properties

39 values across 9 conditions

CONDITION · DIMENSION	RM N/mm²	A5 %	HB
Bar, GOST 18907-73	510–780	14	–
20KH13 (20X13) (annealing) , Bar GOST 5949-75	–	–	126–197
20KH13 (20X13) (normalize, tempering) , Bar GOST 18968-73	–	–	207–241
20KH13 (20X13) , Forging GOST 25054-81	–	–	197–248

CONDITION · DIMENSION	RM N/mm²	RE N/mm²	A %	Z %	AK J/cm²	HB	HRB	HV
Plate/Sheet Hot-rolled	520	225	18	–	–	–	–	–
Bars/Rods	640	440	20	50	78	–	–	–
Hot-rolled	–	–	–	–	–	223	97	234

SOFT ANNEALED	HB	HV
Soft annealed	230	190–240

QUENCHED AND TEMPERED	HV
Quenched and tempered	480–520

DRAWING 740 - 800°C	RM N/mm²	A5 %
1 - 4	490	20

CONDITION · DIMENSION	RM N/mm²	RE N/mm²	A5 %	Z %	KCU kJ/m²
Bar, GOST 5949-75	650–830	440–635	10–16	50–55	590–780

CONDITION · DIMENSION	RM N/mm²	RE N/mm²	A5 %	Z %	KCU kJ/m²
Bar, GOST 18968-73	670	490–655	18	50	690

QUENCHING AND DRAWING	RM N/mm²	RE N/mm²	A5 %	Z %	KCU kJ/m²
to 600	647	441	14–16	40–50	390–640

CONDITION · DIMENSION	RM N/mm²	RE N/mm²	A5 %
Sheet trick, GOST 7350-77	510	375	20

Physical properties

12 values

CONDITION · DIMENSION	RHO g/cm³	E GPa	ALPHA 10^-6/K	LAMBDA W/(m·K)	CP J/(kg·K)	RHO_EL nΩ·m
20	7.67	218	–	23	–	588
100	7.66	214	10.1	26	461	653
200	7.63	208	11.2	26	523	730
300	7.6	200	11.5	26	565	800
400	7.57	189	11.9	26	628	884
500	7.54	181	12.2	27	691	952
600	7.51	169	12.8	26	775	1022
700	7.48	–	12.8	26	963	1102
800	7.45	–	13	27	–	–
900	–	–	–	28	–	–

PROPERTY	VALUE	UNIT
Density	7.7	g/cm³
Elastic modulus	200	GPa
Thermal expansion coefficient	10.3	10^-6/K
Thermal conductivity	30	W/(m·K)
Specific heat capacity	460	J/(kg·K)
Electrical resistivity	600	nΩ·m
Transformation point Ac1	820	°C
Transformation point Ac3	950	°C
Transformation point Ar1	780	°C

Technological properties

PROPERTY	VALUE	UNIT
Weldability	limited weldability.	
Flake sensitivity	not predisposed	
Temper brittleness	predisposed	

Heat treatment

8 regimes

STEP	TEMPERATURE	MEDIUM
Annealing	Temperature not stated	—

STEP	TEMPERATURE	MEDIUM
Annealing	Temperature not stated	—
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Tempering	Temperature not stated	—
Quenching	Temperature not stated	—
Quenching	1000–1050 °C	Oil
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Solution annealing	1000–1060 °C	—
Tempering	Temperature not stated	—
Ageing	600–700 °C	Oil
source joins the operations with (or)		
Annealing	Temperature not stated	—
Tempering	Temperature not stated	—
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Solution annealing	Temperature not stated	—
Tempering	Temperature not stated	—
Ageing	Temperature not stated	—

Designations across standards

56 designations · 1 documented as identical

United States	14
S42000	uns
420	aisi-sae
51420	aisi-sae
S42000	aisi-sae
S42010	aisi-sae
A1049	astm
A176	astm
A182	astm
A276	astm
A314	astm
A473	astm
A580	astm
F1079	astm
F2215	astm

Russia / CIS	11
20Ch13	gost
20KH13	gost
20X13	gost
20Х13	gost
2X13	gost
PK20Kh13	gost
Sv-20Kh13	gost
ПК20Х13-6.4	gost
ПК20Х13-6.8	gost
ПК20Х13-7.4	gost
ст.20Х13	gost

United Kingdom 4

420 S 37 En56C	bs
420S29	bs
420S37	bs
En56C	bs

France 4

X20Cr13	afnor
Z20C13	afnor
Z20Cr13	afnor
Z8CA12	afnor

Spain 4

F.310.J	une
F.3402	une
F.3402-X20Cr 13	une
X20Cr13	une

Europe 3

1.4021	din-en
S42010	din-en
X20Cr13 This grade's own name	din-en

Japan 3

SUS 420J1	jis
SUS 420J1FB	jis
SUS 420J1TKA	jis

United States / Aerospace 2

5506	ams
5621	ams

China 2

2Cr13	gb
X20Cr13	gb

Poland 2

2H13	pn
2H14	pn

Italy 1

X20Cr13	uni

Sweden 1

2303	ss

Czechia 1

17022	csn

Slovakia 1

17 022	stn

Brazil 1

420	abnt

Serbia 1

Č.4172	srps

former Yugoslavia 1

Č.4172	jus

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.

DATASHEET ONLINE	GRADE SEARCH	MATERIAL NO.	ISSUED
View the material page	Search all grades	1.4021	Aug 23, 2026