

MATERIAL NUMBER 1.1133 · CLASS 1.1

F.220A

Material no. 1.1133

also listed as 20Mn5

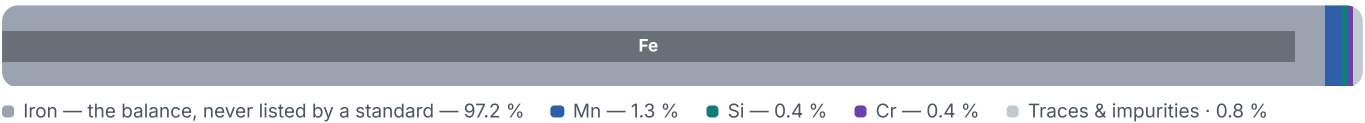
Chemical composition, mechanical and physical property values, and 71 standard designations from 19 regions.

DENSITY 7.85 g/cm ³	OTHER DESIGNATIONS 71 in 19 regions	PROPERTY VALUES 17 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

computed from composition · °C

PREDICTED AE3 802 °C	PREDICTED AE1 714 °C	PREDICTED ACM 464 °C	PREDICTED BS 547 °C
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Mechanical properties

14 values across 4 conditions

NORMALIZED				RM N/mm ²
≤ 100				530
100 – 250				520
250 – 500				500
500 – 750				490
CONDITION · DIMENSION	RM N/mm ²	RE N/mm ²	A %	HB
15 – 15	≥ 785	≥ 590	≥ 10	≤ 187
NORMALIZING 940 - 960°C, DRAWING 630 - 650°C, COOLING AIR, 65°C/H		RM N/mm ²	KCU kJ/m ²	
60 - 90		440	600	
CONDITION · DIMENSION	RM N/mm ²	RE N/mm ²	A5 %	KCU kJ/m ²
Sheet, GOST 5520-79	430-590	255-265	22	590

Physical properties

8 values

CONDITION · DIMENSION	RHO g/cm ³	E GPa	ALPHA 10 ⁻⁶ /K	LAMBDA W/(m·K)	CP J/(kg·K)	RHO_EL nΩ·m
20	7.859	211	–	51.7	–	173
100	7.834	208	11.75	51	470	219
200	7.803	205	12.2	48.5	483	292
300	7.77	200	12.8	44.4	–	381
400	7.736	191	13.2	42.7	525	487
500	7.699	180	13.5	39.3	571	601
600	7.659	165	13.85	35.6	–	758
700	7.617	–	14.6	31.9	–	925
800	7.624	–	12.7	25.9	–	1094
900	7.6	–	12.4	26.4	–	1135
1000	7.548	–	13.4	27.7	–	1167
1100	7.496	–	14.2	28.5	–	1194
1200	–	–	14.8	29.8	–	1219

CONDITION · DIMENSION	E GPa	ALPHA 10 ⁻⁶ /K	LAMBDA W/(m·K)	CP J/(kg·K)
20	210	—	—	—
100	—	—	40.06	—
200	—	12.1	—	—
300	185	—	42.29	—
400	175	13.5	—	—
500	—	—	37.26	—
600	—	14.1	—	—
700	—	—	30.98	—
900	—	—	—	586
1100	—	—	—	620

PROPERTY	VALUE	UNIT
Density	7.85	g/cm ³
Transformation point Ac1	724	°C
Transformation point Ac3	845	°C
Transformation point Ar3	815	°C
Transformation point Ar1	682	°C

Technological properties

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

Heat treatment

5 regimes

STEP	TEMPERATURE	MEDIUM
source joins the operations with + / procedural order		
Quenching	Temperature not stated	—
Tempering	Temperature not stated	—
Quenching	Temperature not stated	—
Carburizing	Temperature not stated	—
Normalizing	880–940 °C	—

STEP	TEMPERATURE	MEDIUM
Normalizing	Temperature not stated	—

Designations across standards

71 designations · 8 documented as identical

United States	19	Spain	4
G15180	uns	20Mn6	une
G15220	uns	F.1515	une
H15220	uns	F.1515-20Mn6	une
1021	aisi-sae	F.220A	une
1022	aisi-sae		
1518	aisi-sae	Japan	4
1522	aisi-sae	S Mn C 420	jis
1522H	aisi-sae	SMn420	jis
G10210	aisi-sae	SMn420H	jis
G10220	aisi-sae	STB510	jis
G15180	aisi-sae		
G15220	aisi-sae	China	4
H15211	aisi-sae	10Mn2	gb
H15220	aisi-sae	20G	gb
K02700	aisi-sae	20Mn2	gb
1022 1518	astm	20MnG	gb
201	astm		
321	astm	Czechia	4
A502	astm	12022	csn
		13030	csn
		13123	csn
		422 714	csn
Russia / CIS	15	France	2
20G	gost	20M5	afnor
20GS2	gost	TU48C	afnor
20GSL	gost		
20KHG2T	gost	International	2
20KHG2TS	gost	22Mn6	iso
20KHGS2	gost	22Mn6H	iso
20N2M	gost		
20Г	gost	Italy	2
20Г2	gost	20Mn7	uni
20HM	gost	G22Mn3	uni
22K	gost		
22KhNM	gost	Poland	2
22K	gost	20G	pn
CHN20D2SH	gost	25	pn
cr.22K	gost		
United Kingdom	5	Europe	1
080A20	bs	20Mn5	din-en
120M19	bs		
150M19	bs		
20Mn5	bs		
90440	bs		

Sweden	1	Bulgaria	1
2132	ss	20G	bds
Slovakia	1	Switzerland	1
13 030	stn	20Mn5	snv
Hungary	1	South Korea	1
Ao20Mn5	msz	SMnC420	ks
Australia / New Zealand	1		
1022	as-nzs		

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 F.220A

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

[Start an enquiry](#)

DATASHEET ONLINE	GRADE SEARCH	MATERIAL NO.	ISSUED
View the material page	Search all grades	1.1133	Aug 20, 2026