

PRODUCT SPECIFICATIONS

Classifications		Mechanical Properties						
		Yield Point N/mm ² (min.)		Tensile Strength N/mm ²	Yield Ratio % (max.)	Elongation % (min.)		
		Thickness			Thickness	Thickness		
		t ≤ 16	16 ≤ t ≤ 40		t ≥ 12	t ≤ 5	5 < t ≤ 16	t > 16
TIS 1227	SM400	245	235	400 - 510	-	23	18	22
	SM490	325	315	490 - 610	-	22	17	21
	SM520	365	355	520 - 640	-	19	15	19
	SS400	245	235	400 - 510	-	21	17	21
	SS490	285	275	490 - 610	-	19	15	19
	SS540	400	390	540 min	-	16	13	17
JIS G3101	SS400	245	235	400 - 510	-	21	17	21
	SS490	285	275	490 - 610	-	19	15	19
	SS540	400	390	540 min	-	16	13	17
JIS G3106	SM400A	245	235	400 - 510	-	23	18	22
	SM400B	245	235	400 - 510	-	23	18	22
	SM490A	325	315	490 - 610	-	22	17	21
	SM490B	325	315	490 - 610	-	22	17	21
	SM490YA	365	355	490 - 610	-	19	15	19
	SM490YB	365	355	490 - 610	-	19	15	19
JIS G3136	SN400A	235	235	400 - 510	-	17	17	21

	SN400B	235 - 355 ^G	235 - 355	400 - 510	80 ^H	18	18	22
	SN490B	325 - 445 ^G	325 - 445	490 - 610	80 ^H	17	17	21
JIS G3116	SG295	295		440 min	-	26		
JIS G3131	SPHC	-	-	270 min	-	t ≤ 1.6	1.6 < t ≤ 3.2	t > 3.2
						27	29	31
EN10025	S275JR	275	265	410 - 560	-	22	22	22
	S355JR	355	345	490 - 630	-	22	22	22
ASTM	A36	250		400 - 550	-	20		
	A572 Gr42	290		415 min	-	20		
	A572 Gr50	345		450 min ^E	-	18		
	A992	345 - 450		450 min	85 ^D	18		
	A283C	205		380 - 515	-	22		
DIN 17100	St33	185	175	290	-	16		
	St37-2	235	225	340 - 470	-	24		
	St44-2	275	265	410 - 540	-	20		
	St50-2	295	285	470 - 610	-	18		
	St52-3	355	345	490 - 630	-	20		

Remark

- Carbon Equivalent (%) = $C + Mn/6 + Si/24 + Ni/40 + Cr/5 + Mo/4 + V/14$ (JIS Standard)
- Carbon Equivalent (%) = $C + Mn/6 + (Cr + Mo + V) / 5 + (Ni + Cu) / 15$ (AS, ASTM Standard)
- Chemical Composition on sensitivity of welding crack = $C + Si/30 + Mn/20 + Cu/20 + Ni/60 + Cr/20 + Mo/15 + V/10 + 5B$
- Bend test on material grades SS400, SS490, SS540
- Additionnal chemical composition controls for material under grade A992 are as follows : Ni (max.) = 0.45, Cr (max.) = 0.35, Mo (max.) = 0.15 and Mn/S (min.) = 20

*: Nitrogen control excluded

PRODUCT SPECIFICATIONS

Classifications		Chemical Compositions				
		C (max.)	Si (max.)	Mn	P (max.)	S (max.)
TIS 1227	SM400	0.20	0.35	0.60 - 1.40	0.035	0.035
	SM490	0.18	0.55	1.6 max.	0.035	0.035
	SM520	0.20	0.55	1.6 max.	0.035	0.035
	SS400	-	-	-	0.050	0.050
	SS490	-	-	-	0.050	0.050
	SS540	0.30	-	1.6 max.	0.040	0.040
JIS G3101	SS400	-	-	-	0.050	0.050
	SS490	-	-	-	0.050	0.050
	SS540	0.30	-	1.6 max.	0.040	0.040
JIS G3106	SM400A	0.23	-	2.5 x C min.	0.035	0.035
	SM400B	0.20	0.35	0.60 - 1.40	0.035	0.035
	SM490A	0.20	0.55	1.6 max.	0.035	0.035
	SM490B	0.18	0.55	1.6 max.	0.035	0.035
	SM490YA	0.20	0.55	1.6 max.	0.035	0.035
	SM490YB	0.20	0.55	1.6 max.	0.035	0.035
JIS G3136	SN400A	0.24	-	-	0.050	0.050
	SN400B	0.20	0.35	0.60 - 1.40	0.030	0.015
	SN490B	0.18	0.55	1.6 max.	0.030	0.015

JIS G3116	SG295	0.20	0.35	1.00 max.	0.040	0.040
JIS G3131	SPHC	-	-	-	0.050	0.050
EN10025	S275JR	0.21	-	1.5 max.	0.045	0.045
	S355JR	0.24	0.55	1.6 max.	0.045	0.045
ASTM	A36	0.26	0.40	-	0.040	0.050
	A572 Gr42	0.21	0.40	1.35 ^F max.	0.040	0.050
	A572 Gr50	0.23	0.40	1.35 ^F max.	0.040	0.050
	A992	0.23	0.10 - 0.40	0.50 - 1.50	0.035	0.045
	A283C	0.24 - 0.29	0.15 - 0.30	0.90	0.035	0.040
DIN 17100	St33	-	-	-	-	-
	St37-2	0.17	-	-	0.050	0.050
	St44-2	0.21	-	-	0.050	0.050
	St50-2	-	-	-	0.050	0.050
	St52-3	0.20	-	-	0.040	0.040

Remark

A : Impact test on material grades SM400, SM490, SM520, SM400B, SM490B, SM490YB, SN400B, SN490B, 43C and 50C with thickness > 12 mm. at 0⁰C

B : Impact test on material grades 43B, 50B, S275JR and S355JR with thickness > 12 mm. at 20⁰C

C : It is permissible to vary the carbon and manganese contents (ladle analysis) for grade 50B and 50C on the basis of an increase of 0.06% manganese content for each decrease of 0.01% carbon or vice versa up to maximum manganese content of 1.60% and maximum carbon content of 0.22% for grades 50B and 50C

D : The yield ratio (max.) for all thickness of materials under grades A992 is 85%

E : For grades 50 steel of thickness 20 mm. and under, the tensile strength shall be a minimum of 485 N/mm²

F : A maximum of manganese of 1.50% is permissible, with an associated reduction of the carbon maximum of 0.03%

G : For the H section, when the t1 is 9 mm. or less, the upper limit of the yield point or proof stress shall not be applied

H : For the H section, when the t1 is 9 mm. or less, the upper limit of the yield ratio shall be 85%