

CCS Rule Change Notice For:
Rules for Materials and Welding

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PART ONE METALLIC MATERIALS

CHAPTER 3 STEEL PLATES, FLAT BARS AND SECTIONS

Section 3 HIGHER STRENGTH HULL STRUCTURAL STEELS

Chemical Composition of Higher Strength Hull Structural Steels Table 3.3.2.1

Grade		AH32, AH36, AH40, DH32, DH36, DH40, EH32, EH36, EH40	FH32, FH36, FH40
Chemical composition (%) ^{⑤⑥}	C	≤ 0.18	≤ 0.16
	Mn	0.90 ~ 1.60 ^①	0.90 ~ 1.60
	Si	≤ 0.50	≤ 0.50
	S	≤ 0.035	≤ 0.025
	P	≤ 0.035	≤ 0.025
	Al(acid soluble)	0.015 ^{②③}	≥ 0.015 ^{②③}
	Nb ^④	0.02 ~ 0.05 ^③	0.02 ~ 0.05 ^③
	V ^④	0.05 ~ 0.10 ^③	0.05 ~ 0.10 ^③
	Ti ^④	≤ 0.02	≤ 0.02
	Cu	≤ 0.35	≤ 0.35
	Cr	≤ 0.20	≤ 0.20
	Ni	≤ 0.40	≤ 0.80
Mo	≤ 0.08	≤ 0.08	
N	—	≤ 0.009 (≤ 0.012 if Al is present)	

Minimum Elongation of Full-Thickness Flat Test Specimens Table 3.3.4.4

Thickness <i>t</i> (mm)	Grade	<i>t</i> ≤ 5	5 < <i>t</i> ≤ 10	10 < <i>t</i> ≤ 15	15 < <i>t</i> ≤ 20	20 < <i>t</i> ≤ 25	25 < <i>t</i> ≤ 30	30 < <i>t</i> ≤ 40	40 < <i>t</i> ≤ 50
		Elongation (%) ^①	AH32, DH32, EH32, FH32	14	16	17	18	19	20
	AH36, DH36, EH36, FH36	13	15	16	17	18	19	20	21
	AH40, DH40, EH40, FH40	12	14	15	16	17	18	19	20

Section 4 HIGH STRENGTH QUENCHED AND TEMPERED STEELS FOR WELDED STRUCTURES

Minimum Elongation of Full-Thickness Flat Test Specimens Table 3.4.4.5

Thickness <i>t</i> (mm)	Grade	<i>t</i> ≤ 10	10 < <i>t</i> ≤ 15	15 < <i>t</i> ≤ 20	20 < <i>t</i> ≤ 25	25 < <i>t</i> ≤ 40	40 < <i>t</i> ≤ 50	50 < <i>t</i> ≤ 70
		Elongation (%) ^①	420	11	13	14	15	16
	460	11	12	13	14	15	16	17
	500	10	11	12	13	14	15	16
	550	10	11	12	13	14	15	16
	620	9	11	12	12	13	14	15
	690	9	10	11	11	12	13	14

Section 7 STEELS FOR LOW TEMPERATURE SERVICE

Chemical Composition of nickel alloy steel Table 3.7.2.3

Grade	Chemical composition (%)						
	C	Mn	Si	P	S	Ni	Other elements
1.5Ni	≤0.14	0.30~1.50	0.10~0.35	≤0.025	≤0.02	1.30~1.70	Cr≤0.25 Mo≤0.08 Cu≤0.35
2.25Ni	≤0.14	≤0.70	≤0.30	≤0.025	≤0.025	2.10~2.50	
3.5Ni	≤0.12	0.30~0.80	0.10~0.35	≤0.025	≤0.02	3.20~3.80	

Grade	Chemical composition (%)						Other elements
	C	Mn	Si	P	S	Ni	
5Ni	≤0.12	0.30~0.90	0.10~0.35	≤0.025	≤0.02	4.70~5.30	Cr+Mo+Cu≤0.60 Al(acid soluble)≥0.015
9Ni	≤0.10	0.30~0.90	0.10~0.35	≤0.025	≤0.02	8.5~10.0	

Note: ① Nitrogen content is not to exceed 0.009% (or 0.012% where aluminium is present).

Conditions of supply and mechanical properties of carbon-manganese steel① Table 3.7.3.1

Grade	Condition of supply②	Yield strength R_{eH} min. (N/mm ²)	Tensile strength R_m (N/mm ²)	Elongation A_5 min. (%)	Charpy V-notch impact tests			Design Temp. min. (°C)	
					Material thickness t (mm)	Test Temp. T (°C)	Average energy of test specimens, min. (J)		
							Long.		Trans.
CL-I-2	Normalized or quenched and tempered	315	440-570	22	$t \leq 25$	-20	41	27	-15
25 < $t \leq 30$					-25				
30 < $t \leq 35$					-30				
35 < $t \leq 40$					-35				
CL-II-2		315	440-570	22	$t \leq 25$	-40	41	27	-35
25 < $t \leq 30$					-45				
30 < $t \leq 35$					-50				
35 < $t \leq 40$					-55				
CL-III-2		315	440-570	22	$t \leq 25$	-60	41	27	-55
25 < $t \leq 30$					-65				
30 < $t \leq 35$	-70								
35 < $t \leq 40$	-75								
CL-I-3	Normalized or quenched and tempered	355	490-630	21	$t \leq 25$	-20	41	27	-15
25 < $t \leq 30$					-25				
30 < $t \leq 35$					-30				
35 < $t \leq 40$					-35				
CL-II-3		355	490-630	21	$t \leq 25$	-40	41	27	-35
25 < $t \leq 30$					-45				
30 < $t \leq 35$					-50				
35 < $t \leq 40$					-55				
CL-III-3		355	490-630	21	$t \leq 25$	-60	41	27	-55
25 < $t \leq 30$					-65				
30 < $t \leq 35$	-70								
35 < $t \leq 40$	-75								
CL-I-4	Normalized or quenched and tempered	390	510-660	20	$t \leq 25$	-20	41	27	-15
25 < $t \leq 30$					-25				
30 < $t \leq 35$					-30				
35 < $t \leq 40$					-35				
CL-II-4		390	510-660	20	$t \leq 25$	-40	41	27	-35
25 < $t \leq 30$					-45				
30 < $t \leq 35$					-50				
35 < $t \leq 40$					-55				
CL-III-4		390	510-660	20	$t \leq 25$	-60	41	27	-55
25 < $t \leq 30$					-65				
30 < $t \leq 35$	-70								
35 < $t \leq 40$	-75								

① The requirement is applicable to materials not over 40 mm in thickness. For materials over 40 mm in thickness, the energy value of Charpy V-notch impact test is subject to agreement of CCS.

② Controlled rolling process or TMCP may replace normalized or quenched and tempered.

③ In the table, the transverse values of impact tests apply to plates and the longitudinal values to sections.

PART TWO NON-METALLIC MATERIALS

CHAPTER 2 PLASTICS MATERIALS

Section 2 RAW MATERIALS

Requirements for Properties of Resin Chock Castings

Table 2.2.7.7

Compressive strength N/mm ²	Compressive modulus N/mm ²	Barcol hardness	Heat deflection temperature °C	Flammability	Water absorption ^① %	Oil absorption ^① %
ASTM D695	ASTM D695	ASTM D2583	ISO 75-2	ASTM D635	ISO 62	ISO 62
≥120	≥5000	≥35	≥80	Self-extinguishing	≤0.9	≤0.9

Note: ① The size of test sample for water and oil absorption is 50 mm × 50 mm × 4 mm.