

10.8.2.1 For the vessel and pressure parts under one of the following conditions, the welded joints of Categories A and B shall be examined by 100% radiographic or ultrasonic method:

(a) thickness  $\delta$ , of carbon steel and 16MnR greater than 30mm;  
 (b) thickness  $\delta$ , of 15MnVR, 15MnV, 20MnMo and austenitic stainless steel greater than 25mm;  
 (c) steels of specified tensile strength lower limit  $\sigma_s > 540$  MPa;  
 (d) thickness  $\delta$ , of 12CrMo, 15CrMoR, 15CrMo and any thickness of other Cr-Mo low alloy steels;

(e) vessel requiring pneumatic test;

(f) vessel filling with extreme or highly toxic substance as prescribed on the drawings;

(g) vessel requiring 100% radiographic or ultrasonic examination as prescribed on the drawings;

(h) welded joint Category A of inner cylinder of wrapped layered pressure vessels;

(i) welded joint Category A of each single wall cylinder of shrink-fit pressure vessels;

(j) whether the welded joints completed with 100% radiographic or ultrasonic examination requiring reexamination, and how long the reexamined weld length depend upon the Designer's decision as prescribed on the drawings.

Note: Those welded butt joints Category B of hubbed flange-to-nozzle (nominal diameter less than 250mm) and nozzle to-nozzle are not included.

TABLE 4-1 ALLOWABLE STRESS OF STEEL PLATE

Designation	Standard of Steel Plate	Application Condition	Thickness mm	Strength at Ambient Temperature		Allowable Stress at Following Temperatures(°C), MPa															Note	
				$\sigma_b$ MPa	$\sigma_s$ MPa	$\leq 20$	100	150	200	250	300	350	400	425	450	475	500	525	550	575		600
Carbon Steel Plate																						
Q235-A.F	GB912	Hot-Rolled	3~4	375	235	113	113	113	105	94												1)
	GB3274		4.5~16	375	235	113	113	113	105	94												1)
Q235-A	GB912	Hot-Rolled	3~4	375	235	113	113	113	105	94	86	77										1)
	GB3274		4.5~16	375	235	113	113	113	105	94	86	77										1)
			>16~40	375	225	113	113	107	99	91	83	75										
Q235-B	GB912	Hot-Rolled	3~4	375	235	113	113	113	105	94	86	77										1)
	GB3274		4.5~16	375	235	113	113	113	105	94	86	77										1)
			>16~40	375	225	113	113	107	99	91	83	75										
Q235-C	GB912	Hot-Rolled	3~4	375	235	125	125	125	116	104	95	86	79									
	GB3274		4.5~16	375	235	125	125	125	116	104	95	86	79									
			>16~40	375	225	125	125	119	110	101	92	83	77									
20R  (285-C)	GB6654	Hot-Rolled or Normalized	6~16	400	245	133	133	132	123	110	101	92	86	83	61	41						
			>16~36	400	235	133	132	126	116	104	95	86	79	78	61	41						
			>36~60	400	225	133	126	119	110	101	92	83	77	75	61	41						
			>60~100	390	205	128	115	110	103	92	84	77	71	68	61	41						
Low Alloy Steel Plate																						
16MnR  516-70	GB6654	Hot-Rolled or Normalized	6~16	510	345	170	170	170	170	156	144	134	125	93	66	43						
			>16~36	490	325	163	163	163	159	147	134	125	119	93	66	43						
			>36~60	470	305	157	157	157	150	138	125	116	109	93	66	43						

Support test: 20R > 25mm  
 16MnR, 15MnVR, 15MnMoNbR > 38mm  
 18MnMoNbR, 15MnNiMoNbR any thick  
 DT < 0°C

DT < -10°C 20R > 12mm

16MnR, 15MnVR, 15MnMoNbR > 20mm