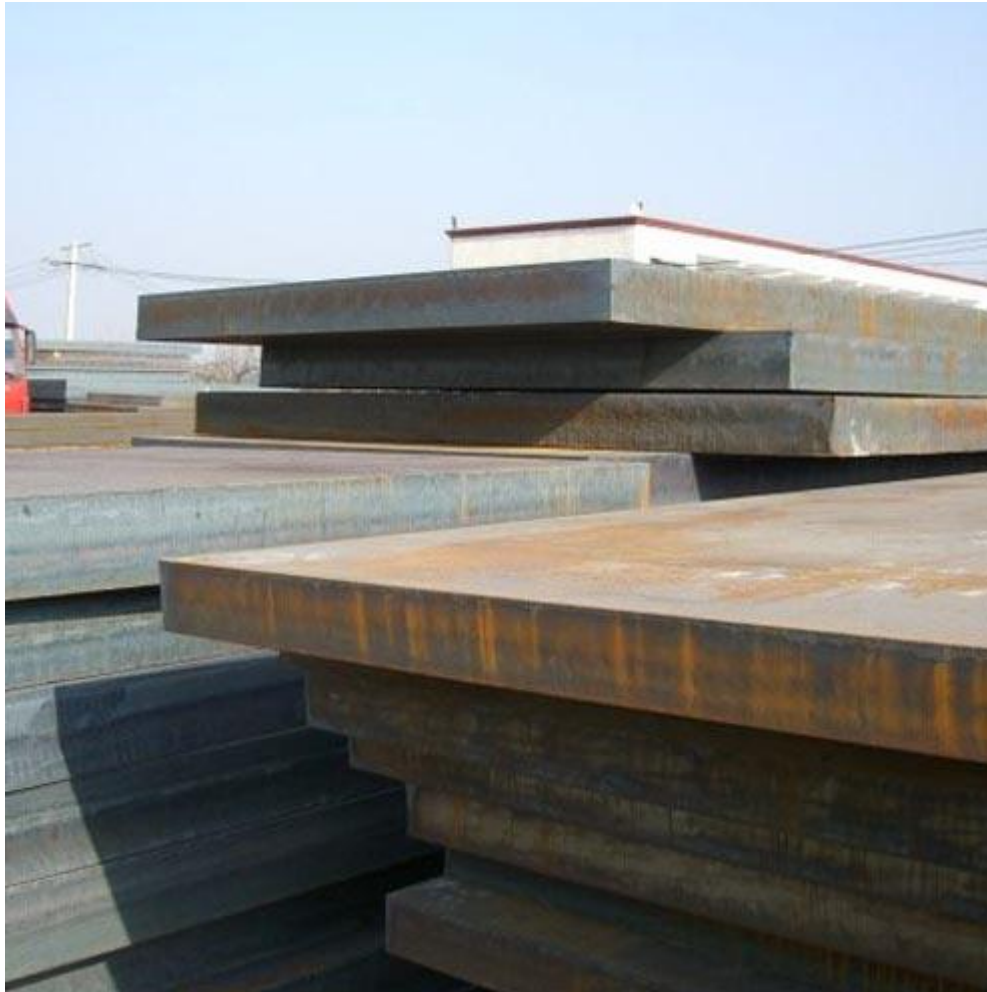


## API Spec 2H

API Spec 2H specification for Carbon Manganese Steel Plate for Offshore Structures, API Spec 2H specification covers two grades of intermediate strength steel plates up to 4 in. thick for use in welded construction of offshore structures, in selected critical portions which must resist impact, plastic fatigue loading, and lamellar tearing. API Spec 2H main steel grade: API Spec 2H Grade 42, Grade 50 (API 2H GR42, API 2H GR50) and so on.



1.1, the code includes two grades of medium strength steel plates for offshore welded structures, thickness less than or equal to 4in.. Such steel plates must be able to resist impact, plastic fatigue load and lamellar tearing at the key parts specified. These steel plates are used in the process of cold forming and welding in accordance with the API 2B specification. Because the welding process is an important foundation, the welding process used is suitable for the steel and its intended use environment. In turn, steel should also be suitable for manufacturing and welding in shipyards and offshore conditions. The API 2W specification and 2Y specification include similar steel grades with similar mechanical properties, but they have the advantages of low preheating temperature and pre evaluation of toughness with API RP 2Z heat affected zone. The improvement of its performance is to reduce the maximum permissible value of the chemical composition and to change the heat treatment and / or processing technology.

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1.2, these steels are mainly used for pipe joints, stiffened panel structures and other connections. In these locations, some panels will be stretched along the thickness direction (Z- direction).

It is required that S4 stipulate the requirement of the thickness direction test of steel plate made by the material manufacturer and the scope of acceptance. It is required that S1 stipulate the requirements of the ultrasonic inspection of the steel plate made by the material manufacturer and the scope of its acceptance. When thickness direction performance is required, but no additional tests are necessary, supplementary requirement S5 provides low sulfur chemical composition, which is intended to reduce the size and quantity of sulfide inclusions in the steel plate. However, it is required that S5 can neither replace the test of S4 thickness direction nor ensure the minimum ductility in the direction of thickness. However, it has been shown that the cross section shrinkage of low sulfur carbon manganese steel is generally at least 20% at the time of Z to tensile test. Even without additional requirements for S5, the API 2H specification also provides a steel with lower sulfur content compared with other commonly used structural steels.

The 1.3 notch toughness in section seventh or S12 in the requirements applicable to the lowest working temperature is 14[degrees Fahrenheit -10] degrees Celsius under water or water temperature and climate environment. The toughness of the cold forming material is lower than the original steel plate due to the strain, especially in the welding area with short pipe and support and over aging treatment. The requirements for the sheet in the seventh section include appropriate adjustment measures for the reduction of toughness resulting from strain and aging.

Standard: API SPEC 2H

Grade :API Spec 2H Grade 42, Grade 50

Thickness : 8mm-500mm

Width : 1000mm-4000mm

Length : 1000mm-20000mm

MOQ: 1 PC

Product type : Steel plate

Delivery time : Promptly ( Stock) or 10-40 days (Production)

Stock : Available

MTC: Available

Delivery condition: AS REQUIREMENTS

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Table 1—Chemical Requirements

Element	Requirement, Wt. %		Element	Requirement, Wt. %	
	Grade 42	Grade 50		Grade 42	Grade 50
Carbon, max			Colombium		
Heat analysis	0.18	0.18	Heat analysis	0.04 max	0.01 – 0.04
Product analysis	0.22	0.22	Titanium	0.020 max <sup>b</sup>	0.020 max <sup>b</sup>
Manganese			Aluminum, total		
Heat analysis	0.90 – 1.35 <sup>a</sup>	1.15 – 1.60	Heat analysis	0.02 – 0.06	0.02 – 0.06
Phosphorus, max			Nitrogen, max		
Heat analysis	0.030	0.030	Heat analysis	0.012 <sup>c</sup>	0.012 <sup>c</sup>
Sulfur, max			Vanadium	d	d
Heat analysis	0.010	0.010			
Product analysis	0.015	0.015			
Silicon					
Heat analysis	0.05 – 0.40	0.05 – 0.40			
Product analysis	0.05 – 0.45	0.05 – 0.45			

## Notes:

<sup>a</sup>Manganese up to 1.60 on heat analysis is permitted at the option of the material manufacturer.

<sup>b</sup>Minimum values, if any, shall be as agreed upon and stated on the order.

<sup>c</sup>Shall not be intentionally added.

<sup>d</sup>Shall not be intentionally added without the specific approval of the purchaser, in which case the limiting values for heat and product analyses shall be agreed upon and stated on the order.

Table 2—Tensile Requirements(transverse tests)

Property	Grade 42	Grade 50
Yield Strength		
ksi (MPa), min.		
t ≤ 2.5 in.	42 (289)	50 (345)
t > 2.5 in.	42 (289)	47 (324)
Tensile strength		
ksi (MPa)	62–82 (427–565)	70–90 (483–620)
Elongation, %, min.		
in 2 in. (50 mm)	22	21
in 8 in. (200 mm)	18	16

Table 3—Notch Toughness Requirements Charpy V-Notch Testing

Grade	Option	Specimen Size		Minimum Average Energy ft-lb (J)	Minimum Single Value ft-lb (J)	Test Temperature °F (°C)
		in.	mm			
42	A	0.394 x 0.394	10 x 10	25 (34)	20 (27)	-40 (-40)
	B	0.295 x 0.394	7.5 x 10	25 (34)	20 (27)	-40 (-40)
	C	0.197 x 0.394	5.0 x 10	25 (34)	20 (27)	-40 (-40)
	D	0.295 x 0.394	7.5 x 10	19 (26)	15 (20)	-50 (-46)
	E	0.197 x 0.394	5.0 x 10	13 (18)	10 (14)	-80 (-62)
50	A	0.394 x 0.394	10 x 10	30 (41)	25 (34)	-40 (-40)
	B	0.295 x 0.394	7.5 x 10	30 (41)	25 (34)	-40 (-40)
	C	0.197 x 0.394	5.0 x 10	30 (41)	25 (34)	-40 (-40)
	D	0.295 x 0.394	7.5 x 10	23 (31)	19 (26)	-50 (-46)
	E	0.197 x 0.394	5.0 x 10	15 (20)	13 (18)	-80 (-62)