UDC 669.14-462:621.181:66.045:66.042.886

JIS

JAPANESE INDUSTRIAL STANDARD

Carbon Steel Boiler and Heat Exchanger Tubes

JIS G 3461—1988

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Carbon Steel Boiler and Heat Exchanger Tubes

G 3461-1988

1. Scope

This Japanese Industrial Standard specifies the carbon steel tubes, hereinafter referred to as the "tubes", used for exchanging heat on the inside and outside of the tube, such as water tubes, smoke tubes, superheater tubes, air preheater tubes, etc. of the boiler, and heat exchanger tubes, condenser tubes, catalyser tubes, etc. used in chemical and petroleum industries. However, it is not applicable to the steel tubes for heating furnace and steel heat exchanger tubes for low temperature service.

Remarks 1. The purchaser may designate in addition to the items specified in this text, by prior agreement with the manufacturer, part or all of the items in the supplementary quality requirements Z1, Z2, Z3 and Z4 specified in Appendix 1 and the item of the U-bend tube specified in Appendix 2.

Appendix 1	Z 1	Hardness
Appendix 1	Z 2	Elevated temperature yield point or proof stress
Appendix 1	Z 3	Ultrasonic examination
Appendix 1	Z 4	Eddy current examination
Appendix 2		U-bend tube

2. The units and numerical values given in { } in this Standard are based on the International System of Units (SI) and are appended for informative reference.

Further, the traditional units accompanied by numerical values in this Standard shall be converted to the SI units and numerical values on Jan. 1, 1991.

2. Classes and Symbols

The tube shall be classified into 3 grades and their class symbols shall be as given in Table 1-1 or Table 1-2.

Table 1-1. Class Symbols
(Applicable till the end of 1990)

Class symbol
STB 35
STB 42
STB 52

Applicable Standards: See page 21.

Table 1-2. Class Symbols
(Applicable on and after Jan. 1, 1991)

Class symbol	(Informative reference) Traditional symbol
STB 340	STB 35
STB 410	STB 42
STB 510	STB 52

3. Chemical Composition

The tube shall be tested in accordance with 9.1 and the resulting ladle analysis values shall conform to Table 2-1 or Table 2-2.

Table 2-1. Chemical Composition
(Applicable till the end of 1990)

Unit: %

Symbol of class	C	Si	Mn	P	S
STB 35	0.18 max.	0.35 max.	0.30 to 0.60	0.035 max.	0.035 max.
STB 42	0.32 max.	0.35 max.	0.30 to 0.80	0.035 max.	0.035 max.
STB 52	0.25 max.	0.35 max.	1.00 to 1.50	0.035 max.	0.035 max.

Remarks 1. When the purchaser requires product analysis, the permissible deviations for the values given above shall be as specified in Table 2 in JIS G 0321 for the seamless steel tube and likewise in Table 1 for the electric resistance welded steel tube.

2. Where required by the purchaser, Si may be designated as 0.10 to 0.35 %.

Table 2-2. Chemical Composition
(Applicable on and after Jan. 1, 1991)

Unit: %

Symbol of class	C	Si	Mn	P	S
STB 340	0.18 max.	0.35 max.	0.30 to 0.60	0.035 max.	0.035 max.
STB 410	0.32 max.	0.35 max.	0.30 to 0.80	0.035 max.	0.035 max.
STB 510	0.25 max.	0.35 max.	1.00 to 1.50	0.035 max.	0.035 max.

Remarks 1. When the purchaser requires product analysis, the permissible deviations for the values given above shall be as specified in Table 2 in JIS G 0321 for the seamless steel tube and likewise in Table 1 for the electric resistance welded steel tube.