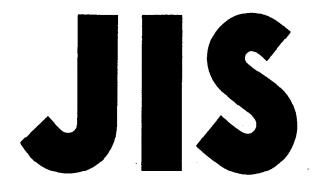
UDC 669.14-462:621.181:66.045:66.042.886



# JAPANESE INDUSTRIAL STANDARD

# Carbon Steel Boiler and Heat Exchanger Tubes

(J) JIS G 3461-1988

Translated and Published

by

Japanese Standards Association

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In the event of any doubt arising, the original Standard in Japanese is to be final authority. UDC 669.14-462:621.181:66.045:66.042.886



#### JAPANESE INDUSTRIAL STANDARD

JIS

#### 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.

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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)

Symbol of class	С	Si	Mn	Р	S 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.

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- 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.