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JIS

JAPANESE INDUSTRIAL STANDARD

Nickel Chromium Molybdenum Steels

JIS G 4103 -1979

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JAPANESE INDUSTRIAL STANDARD J I S

Nickel Chromium Molybdenum Steels G 4103-1979

1. Scope

This Japanese Industrial Standard specifies nickel chromium molybdenum steels mainly for machine structural use manufactured by hot forming, such as hot rolling and forging, ordinarily used after further processes of forging, cutting, and heat treatment, hereinafter referred to as the "steel".

2. Classification and Symbol

The steel shall be classified into 11 classes and the respective symbol shall be as given in Table 1.

Table 1. Classes and Symbols

Symbol of class	Reference	Application
	Previous symbol	
SNCM 220	SNCM 21	SNCM 220, SNCM 415, SNCM 420, SNCM 616 and SNCM 815 are used mainly for case-hardening.
SNCM 240	SNCM 6	
SNCM 415	SNCM 22	
SNCM 420	SNCM 23	
SNCM 431	SNCM 1	
SNCM 439	SNCM 8	
SNCM 447	SNCM 9	
SNCM 616	SNCM 26	
SNCM 625	SNCM 2	
SNCM 630	SNCM 5	
SNCM 815	SNCM 25	

3. Method of Manufacture

3.1 The steel shall be manufactured from killed steel ingot.

3.2 The steel shall be rolled or forged from steel ingot to forging ratio not less than 4 S. However, when the forging ratio of the billet for forging or rolling is less than 4 S, a prior agreement between the purchaser and the manufacturer is necessary.

3.3 Unless otherwise specified, the steel shall be left in the state as rolled or as forged.

4. Chemical Composition

The chemical composition of the steel shall be determined by the ladle analysis and the value shall be as given in Table 2.

Applicable Standards and Reference Standard: See page 10.

Table 2. Chemical Composition

Symbol of class	Reference: Previous symbol	Chemical composition %							
		C	Si	Mn	P	S	Ni	Cr	Mo
SNCM 220	SNCM 21	0.17 ~ 0.23	0.15 ~ 0.35	0.60 ~ 0.90	0.030 max.	0.030 max.	0.40 ~ 0.70	0.40 ~ 0.65	0.15 ~ 0.30
SNCM 240	SNCM 6	0.38 ~ 0.43	0.15 ~ 0.35	0.70 ~ 1.00	0.030 max.	0.030 max.	0.40 ~ 0.70	0.40 ~ 0.65	0.15 ~ 0.30
SNCM 415	SNCM 22	0.12 ~ 0.18	0.15 ~ 0.35	0.40 ~ 0.70	0.030max.	0.030 max.	1.60 ~ 2.00	0.40 ~ 0.65	0.15 ~ 0.30
SNCM 420	SNCM 23	0.17 ~ 0.23	0.15 ~ 0.35	0.40 ~ 0.70	0.030 max.	0.030 max.	1.60 ~ 2.00	0.40 ~ 0.65	0.15 ~ 0.30
SNCM 431	SNCM 1	0.27 ~ 0.35	0.15 ~ 0.35	0.60 ~ 0.90	0.030 max.	0.030 max.	1.60 ~ 2.00	0.60 ~ 1.00	0.15 ~ 0.30
SNCM 439	SNCM 8	0.36 ~ 0.43	0.15 ~ 0.35	0.60 ~ 0.90	0.030 max.	0.030 max.	1.60 ~ 2.00	0.60 ~ 1.00	0.15 ~ 0.30
SNCM 447	SNCM 9	0.44 ~ 0.50	0.15 ~ 0.35	0.60 ~ 0.90	0.030 max.	0.030 max.	1.60 ~ 2.00	0.60 ~ 1.00	0.15 ~ 0.30
SNCM 616	SNCM 26	0.13 ~ 0.20	0.15 ~ 0.35	0.80 ~ 1.20	0.030 max.	0.030 max.	2.80 ~ 3.20	1.40 ~ 1.80	0.40 ~ 0.60
SNCM 625	SNCM 2	0.20 ~ 0.30	0.15 ~ 0.35	0.35 ~ 0.60	0.030 max.	0.030 max.	3.00 ~ 3.50	1.00 ~ 1.50	0.15 ~ 0.30
SNCM 630	SNCM 5	0.25 ~ 0.35	0.15 ~ 0.35	0.35 ~ 0.60	0.030 max.	0.030 max.	2.50 ~ 3.50	2.50 ~ 3.50	0.50 ~ 0.70
SNCM 815	SNCM 25	0.12 ~ 0.18	0.15 ~ 0.35	0.30 ~ 0.60	0.030 max.	0.030 max.	4.00 ~ 4.50	0.70 ~ 1.00	0.15 ~ 0.30

Remarks 1. As impurities, Cu shall not exceed 0.30 % throughout all classes.

2. When the product analysis on steel is requested by the purchaser, the tolerance for the product analysis shall conform to Table 3 in JIS G 0321.

5. Appearance, Shape, Dimension and Dimensional Tolerance

5.1 Hot Rolled Steel Bar and Wire Rod

5.1.1 Appearance The appearance of the hot rolled steel bar and wire rod shall be well finished and free from harmful defects in use. However, the steel bar which is supplied in coil is possibly inclusive of some abnormal points.

5.1.2 Reference of Flaw Dressing The reference of flaw dressing of the hot rolled steel bar shall be as follows:

(1) Steel Bar for General Forging Use The reference of flaw dressing of the steel bar for general forging use shall be made smoothly to the depth not exceeding 4 % of nominal size (maximum value 5 mm) below nominal size, and to the total width not exceeding 1/4 of the circumferential length of the same section. If the dressed portions are within the dimensional tolerance, they shall not be considered as the portions dressed.

The permissible amount of remaining flaws shall be as agreed upon between the purchaser and the manufacturer.

(2) Round Bar for Direct Machining The permissible depth of flaw on round bar for direct machining shall conform to the value given in Table 3 deducted from the nominal size.