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JIS

JAPANESE INDUSTRIAL STANDARD

Chromium Molybdenum Steels

JIS G 4105 —1979

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Chromium Molybdenum Steels

G 4105-1979

1. Scope

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

2. Classification and Symbol

The steel shall be classified into 10 classes and the respective symbols shall be as given in Table 1.

Table 1. Classes and Symbols

Symbol of class	Reference	Application
	Previous symbol	
SCM 415	SCM 21	SCM 415, SCM 418, SCM 420, SCM 421 and SCM 822 are used mainly for case hardening.
SCM 418	—	
SCM 420	SCM 22	
SCM 421	SCM 23	
SCM 430	SCM 2	
SCM 432	SCM 1	
SCM 435	SCM 3	
SCM 440	SCM 4	
SCM 445	SCM 5	
SCM 822	SCM 24	

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 11.

Table 2. Chemical Composition

Symbol of class	Reference: Previous symbol	Chemical composition %						
		C	Si	Mn	P	S	Cr	Mo
SCM 415	SCM 21	0.13 to 0.18	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 418	—	0.16 to 0.21	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 420	SCM 22	0.18 to 0.23	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 421	SCM 23	0.17 to 0.23	0.15 to 0.35	0.70 to 1.00	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 430	SCM 2	0.28 to 0.33	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 432	SCM 1	0.27 to 0.37	0.15 to 0.35	0.30 to 0.60	0.030 max.	0.030 max.	1.00 to 1.50	0.15 to 0.30
SCM 435	SCM 3	0.33 to 0.38	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 440	SCM 4	0.38 to 0.43	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 445	SCM 5	0.43 to 0.48	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.15 to 0.30
SCM 822	SCM 24	0.20 to 0.25	0.15 to 0.35	0.60 to 0.85	0.030 max.	0.030 max.	0.90 to 1.20	0.35 to 0.45

Remarks 1. As impurities, Ni and Cu shall not exceed 0.25 % and 0.30 %, respectively, 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 flaw dressing of the steel bar for general forging use shall be made smoothly and to the depth not exceeding 4 % of nominal size (maximum value 5 mm) below nominal size, and the total width not exceeding 1/4 of the circumferential length of the same section. If the dressed portions are within the permissible tolerance, however, they shall not be considered as the portions dressed.

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

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