

Chromium Molybdenum Steels*

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

Refer to JIS G 4102.

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.

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 ± 0.18	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 418	—	0.16 ± 0.21	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 420	SCM 22	0.18 ± 0.23	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 421	SCM 23	0.17 ± 0.23	0.15 ± 0.35	0.70 ± 1.00	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 430	SCM 2	0.28 ± 0.33	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 432	SCM 1	0.27 ± 0.37	0.15 ± 0.35	0.30 ± 0.40	0.030 max.	0.030 max.	1.00 ± 1.50	0.15 ± 0.30
SCM 435	SCM 3	0.33 ± 0.38	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 440	SCM 4	0.38 ± 0.43	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 442	SCM 5	0.43 ± 0.48	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.15 ± 0.30
SCM 443	SCM 24	0.20 ± 0.25	0.15 ± 0.35	0.60 ± 0.85	0.030 max.	0.030 max.	0.90 ± 1.20	0.35 ± 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
Refer to JIS G 4102.
6. Test Refer to JIS G 4102.
7. Inspection
Refer to JIS G 4102.
8. Marking
Refer to JIS G 4102.
9. Report
Refer to JIS G 4102.

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Scope

This Japanese Industrial Standard covers low alloy steels for machine structural use, hot rolling and forging, ordinary heat treatment, heat treatment.

Classification and Symbol
The steel shall be classified as follows in Table 1.

Symbol of class	Previous symbol
SMn 420	
SMn 433	
SMn 438	
SMn 443	
SMnC 420	
SMnC 443	

Method of Manufacture

Refer to JIS G 4102.

Chemical Composition

The chemical composition shall be determined by the analysis and the value shall be as follows in Table 2.

Symbol of class	Reference Previous symbol	C
SMn 420	SMn 21	0.17 ± 0.23
SMn 433	SMn 1	0.30 ± 0.36
SMn 438	SMn 2	0.35 ± 0.41
SMn 443	SMn 3	0.40 ± 0.46
SMnC 420	SMnC 21	0.17 ± 0.23
SMnC 443	SMnC 3	0.40 ± 0.46

Remarks 1. As impurities, Ni and Cu shall not exceed 0.25 % and 0.30 % respectively, throughout all classes.