

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 683 / XI

HEAT-TREATED STEELS, ALLOY STEELS
AND FREE-CUTTING STEELS

PART 11
WROUGHT CASE HARDENING STEELS

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 683/XI, *Heat-treated steels, alloy steels and free-cutting steels – Part 11 : Wrought case hardening steels*, was drawn up by Technical Committee ISO/TC 17, *Steel*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1366, which was circulated to all the ISO Member Bodies for enquiry in December 1967. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	South Africa, Rep. of
Austria	India	Spain
Belgium	Israel	Sweden
Canada	Italy	Switzerland
Colombia	Japan	Thailand
Czechoslovakia	Korea, Rep. of	Turkey
Denmark	Netherlands	U.A.R.
Finland	New Zealand	United Kingdom
France	Norway	U.S.A.
Germany	Romania	U.S.S.R.

The following Member Bodies opposed the approval of the Draft :

Brazil
Poland

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

HEAT-TREATED STEELS, ALLOY STEELS AND FREE-CUTTING STEELS

PART 11 WROUGHT CASE HARDENING STEELS

1. SCOPE

1.1 This ISO Recommendation covers grades of wrought

- unalloyed steels,
- chromium steels,
- manganese-chromium steels,
- nickel-molybdenum steels,
- chromium-molybdenum steels,
- nickel-chromium steels,
- nickel-chromium-molybdenum steels,

usually intended for use in the case hardened condition.

1.2 This ISO Recommendation comprises the three series of steels listed in Table 2 which differ in their sulphur content. The sulphur contents for each series are

- a maximum of 0.035 % for all grades;
- a range of 0.020 to 0.035 % for all grades (steels designated with suffix a);
- a range of 0.030 to 0.050 % for unalloyed steels (steels designated with suffix b).

The second and third series have improved machinability.

2. REQUIREMENTS

2.1 Production processes

Unless otherwise agreed in the order, the processes used in making the steel and the product are left to the discretion of the manufacturer, but the steel should be killed. When he so requests, the user should be informed what steelmaking process is being used.

2.2 Chemical composition and mechanical properties

2.2.1 The steels covered by this ISO Recommendation should be ordered and delivered in accordance with Table 1.

The type of condition of delivery according to Table 1 should be stated at the time of enquiry and order.

TABLE 1 — Types of condition of delivery

Requirements	Types of condition of delivery*																					
	1	2	2(b)	2(c)	2(d)	2(e)	5	5(b)	5(c)	5(d)	5(e)	7	8	8(b)	8(c)	8(d)	8(e)	9	9(b)	9(c)	9(d)	9(e)
Chemical composition	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hardenability	-	X	X	X	X	X	-	-	-	-	-	-	X	X	X	X	X	-	-	-	-	-
Hardness																						
- maximum value as wrought	-	-	X	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	X	-	-	-
- maximum value as annealed	-	-	-	X	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	X	-	-
- range as treated for improved machinability	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	X	-
- maximum value as cold drawn	-	-	-	-	-	X	-	-	-	-	X	-	-	-	-	-	X	-	-	-	-	X
Mechanical properties for simulated case-hardened test bars	-	-	-	-	-	-	X	X	X	X	X	-	-	-	-	-	-	X	X	X	X	X
Grain size	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X

* The numbers indicating the types of condition of delivery follow a co-ordinated series of numbers throughout all relevant ISO Recommendations.