

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 630

STRUCTURAL STEELS

see also 1032

1st EDITION
November 1967

COPYRIGHT RESERVED

The copyright of ISO Recommendations and ISO Standards belongs to ISO Member Bodies. Reproduction of these documents, in any country, may be authorized therefore only by the national standards organization of that country, being a member of ISO.

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 630, *Structural 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 by the Technical Committee began in 1957 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In February 1966, this Draft ISO Recommendation (No. 918) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	India	Spain
Austria	Japan	Sweden
Belgium	Korea, Rep. of	Switzerland
Canada	New Zealand	Turkey
Chile	Norway	U.A.R.
Czechoslovakia	Poland	United Kingdom
Denmark	Portugal	U.S.S.R.
France	Republic	Yugoslavia
Germany	of South Africa	
Hungary	Romania	

Two Member Bodies opposed the approval of the Draft:

Italy
Netherlands

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1967, to accept it as an ISO RECOMMENDATION.

STRUCTURAL STEELS

1. SCOPE

This ISO Recommendation applies to heavy and medium plates (3 mm and over), wide flats, bars and hot-rolled sections, generally used in the delivery condition and normally intended for bolted, riveted or welded structures (see Annex). Table 1 shows which are the grades and qualities covered by this ISO Recommendation and Table 2, their relevant chemical composition and mechanical properties.

This ISO Recommendation does not cover steels intended for boilers or pressure vessels.

TABLE 1. — Grades and qualities

Grades	Qualities			
	A	B	C	D
Fe 33	—	—	—	—
Fe 37	×	×	×	×
Fe 42	×	×	×	×
Fe 44	×	×	×	×
Fe 52	—	×	×	×

50, 60, 70 } see 1052

TABLE 2. — Chemical composition and mechanical properties

Grades	Qualities	Chemical composition		Tensile properties			Bend test	Impact test		
		Ladle	Product *	R_e	R_m	$A\%$		at ambient temperature **	at 0 °C	at -20 °C ***
Fe 33	0				×		×			
Fe 37	A	×	×	×	×	×	×	×		
	B	×	×	×	×	×	×	×	×	
	C	×	×	×	×	×	×		×	
	D	×	×	×	×	×	×			×
Fe 42	A	×	×	×	×	×	×	×		
	B	×	×	×	×	×	×	×	×	
	C	×	×	×	×	×	×		×	
	D	×	×	×	×	×	×			×
Fe 44	A	×	×	×	×	×	×	×		
	B	×	×	×	×	×	×	×	×	
	C	×	×	×	×	×	×		×	
	D	×	×	×	×	×	×			×
Fe 52	B	×	×	×	×	×	×	×	×	
	C	×	×	×	×	×	×		×	
	D	×	×	×	×	×	×			×

* Verifications of the chemical composition on the product are not carried out unless specified on the order.

** For quality B steels, the impact value need be determined only if required by the order.

*** By agreement between the producer and the purchaser, the impact value of 2.8 kgf.m fixed for the V-notch test piece can be verified at temperatures below -20 °C and down to -50 °C.

2. CHARACTERISTICS OF GRADES AND QUALITIES

2.1 Chemical composition

2.1.1 Ladle analysis. The composition limits for analysis carried out on the ladle sample are given in Table 3 and are maximum values.

2.1.2 Product analysis. This analysis can be requested by the purchaser, in which case it should be specified on the order. The composition limits are given in Table 3 and are maximum values.

The analysis is carried out on a sample for chemical analysis taken from the test pieces used for the verification of the mechanical properties—or from a corresponding location—and over the whole thickness of the product (see diagrams in section A.3 of Annex).

TABLE 3. — Chemical composition

Grades	Qualities	C max. %		P max. %		S max. %	
		Ladle	Product	Ladle	Product	Ladle	Product
Fe 33	0						
Fe 37	A	0.20	0.25	0.08	0.100	0.06	0.075
	B *	0.20	0.25	0.06	0.075	0.05	0.062
	C	0.17	0.20	0.05	0.055	0.05	0.055
	D	0.17	0.20	0.045	0.050	0.045	0.050
Fe 42	A	0.25	0.31	0.08	0.100	0.06	0.075
	B *	0.22	0.27	0.06	0.075	0.05	0.062
	C	0.20	0.23	0.05	0.055	0.05	0.055
	D	0.20	0.23	0.045	0.050	0.045	0.050
Fe 44	A	0.25	0.31	0.08	0.100	0.06	0.075
	B *	0.22	0.27	0.06	0.075	0.05	0.062
	C	0.20	0.23	0.05	0.055	0.05	0.055
	D	0.20	0.23	0.045	0.050	0.045	0.050
Fe 52 **	B	0.22	0.25	0.06	0.065	0.05	0.055
	C	0.20 ***	0.23 ***	0.05	0.055	0.05	0.055
	D	0.20 ***	0.23 ***	0.045	0.050	0.045	0.050

* In the case of steel other than rimming steel, the percentages on the product are as follows:

Fe 37-B	C = 0.23	P = 0.065	S = 0.055
Fe 42-B	C = 0.25	P = 0.065	S = 0.055
Fe 44-B	C = 0.25	P = 0.065	S = 0.055

** Fe 52: The maximum ladle percentages of manganese and silicon are respectively 1.50 and 0.55

When the manganese content exceeds 1.5 % and is less than 1.65 % the formula $C + \frac{Mn}{6} \leq 0.45$ may be applied if stated on the order.

*** For products thicker than 16 mm, a maximum carbon content of 0.22% for ladle analysis and 0.25% for product analysis is permitted.