
International Standard



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Steel and cast iron — Determination of sulphur content — Combustion titrimetric method

Aciers et fontes — Dosage du soufre — Méthode titrimétrique après combustion

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 671 was developed by Technical Committee ISO/TC 17, *Steel*.

It was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces ISO Recommendation R 671-1968, which had been approved by the member bodies of the following countries :

Australia	Hungary	Romania
Austria	India	South Africa, Rep. of
Belgium	Israel	Spain
Brazil	Italy	Sweden
Canada	Japan	Switzerland
Chile	Korea, Rep. of	Turkey
Czechoslovakia	Netherlands	United Kingdom
Denmark	New Zealand	Yugoslavia
Egypt, Arab Rep. of	Norway	
Germany, F. R.	Poland	

The member bodies of the following countries had expressed disapproval of the document on technical grounds :

France
Portugal
USA

Steel and cast iron — Determination of sulphur content — Combustion titrimetric method

1 Scope and field of application

This International Standard specifies a titrimetric method for the determination of sulphur in steel and cast iron, after combustion of the test portion in a current of oxygen.

2 References

ISO 377/2, *Selection and preparation of samples and test pieces of wrought steels — Part 2 : Samples and test pieces intended for the determination of the chemical composition.*¹⁾

ISO 565, *Test sieves — Woven metal wire cloth, perforated plate and electroformed sheet — Nominal sizes of openings.*²⁾

3 Principle

Combustion of a test portion at a high temperature (1 450 °C) in a current of pure oxygen, if necessary in the presence of a metal flux. Transformation of sulphur into sulphur dioxide. Absorption of the gases resulting from combustion, freed from oxide dust, by a solution of potassium sulphate and hydrogen peroxide.

Titration of the absorbent solution with a standard sodium borate solution.

4 Reagents

During analysis, unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

NOTE — Verify by blank tests that reagents are free from sulphur. The results should be corrected accordingly.

4.1 Oxygen, minimum purity 99 % (V/V), free from sulphur-bearing compounds.

4.2 Soda asbestos, particle size : approximately 2 mm.

4.3 Magnesium perchlorate, $\text{Mg}(\text{ClO}_4)_2$, particle size : approximately 2 mm.

4.4 Pure iron, of known low sulphur content.

4.5 Fluxes, iron, copper or tin, of known low sulphur content.

4.6 Absorbent solution

Dissolve 5 g of potassium sulphate in 200 ml of boiled and cooled water. Add 100 ml of hydrogen peroxide and dilute to 2 500 ml with boiled and cooled water.

4.7 Sodium borate, standard solution, corresponding to 0,010 % of sulphur for 1 g/ml of test portion.

Weigh, to the nearest 0,000 1 g, 2,383 9 g of sodium borate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$, dissolve in boiled and cooled water and dilute to exactly 2 000 ml with the same water.

1 ml of this standard solution contains 0,010 % of sulphur for 1,000 g of test portion.

4.8 Mixed indicator

Dissolve 0,1 g of methylene blue and 0,3 g of methyl red in water and dilute to 500 ml with water.

NOTE — The proportions of the indicators may be adjusted to the sensitivity of the eye of the operator. The coloration of the indicator may be evaluated by means of an optical device.

1) At present at the stage of draft. (Partial revision of ISO/R 377-1964.)

2) At present at the stage of draft. (Revision of ISO 565-1972.)