

INTERNATIONAL
STANDARD

ISO
10701

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**Steel and iron — Determination of sulfur
content — Methylene blue
spectrophotometric method**

*Aciers et fontes — Dosage du soufre — Méthode spectrophotométrique
au bleu de méthylène*



Reference number
ISO 10701:1994(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10701 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

Annexes A and B of this International Standard are for information only.

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Steel and iron — Determination of sulfur content — Methylene blue spectrophotometric method

1 Scope

This International Standard specifies a methylene blue spectrophotometric method for the determination of sulfur in steel and iron.

The method is applicable to sulfur contents between 0,000 3 % (m/m) and 0,010 % (m/m). However, niobium, silicon, tantalum and titanium interfere in the determination of sulfur.

Depending on the concentration of the interfering elements, the application ranges and test portion masses given in table 1 apply.

Table 1

Maximum allowable content of the interfering elements % (m/m)				Test portion g	Application ranges Δw_s % (m/m)
Nb	Si	Ta	Ti		
0,5	1,0	0,3	1,0	1,0	0,000 3 to 0,001 0
1,0	2,0	0,6	2,0	0,50	0,001 0 to 0 010

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 377-2:1989, *Selection and preparation of samples and test pieces of wrought steels — Part 2: Samples for the determination of the chemical composition.*

ISO 385-1:1984, *Laboratory glassware — Burettes — Part 1: General requirements.*

ISO 648:1977, *Laboratory glassware — One-mark pipettes.*

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks.*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods.*

ISO 5725:1986, *Precision of test methods — Determination of repeatability and reproducibility for a standard test method by inter-laboratory tests.*

3 Principle

Dissolution of a test portion in a mixture of hydrochloric and nitric acids.

Evaporation with perchloric acid until white fumes appear to remove hydrochloric and nitric acids.

Dissolution of the salts in hydrochloric acid. Evolution of hydrogen sulfide by reducing with a mixture of hydroiodic and hypophosphorous acids in a nitrogen atmosphere, distillation, and absorption into zinc acetate solution.

Formation of methylene blue by reacting with *N,N*-dimethyl-*p*-phenylenediamine and iron(III) solution.

Spectrophotometric measurement at a wavelength of about 665 nm.