

# Teknisk specifikation

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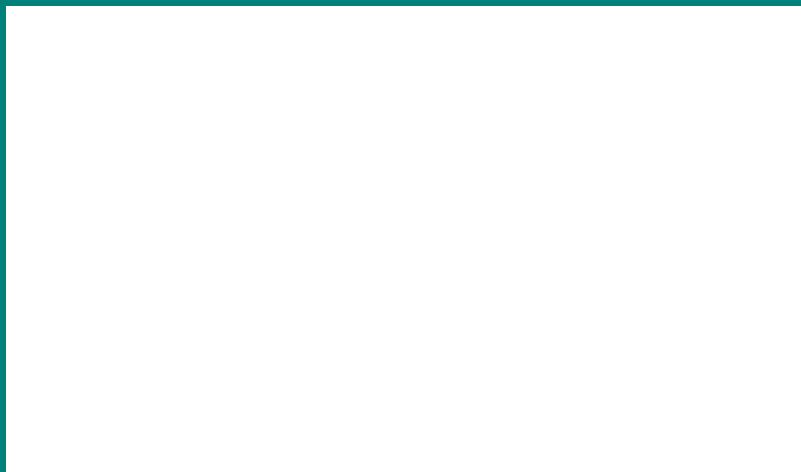
ICS: 77.040.30; 77.120.30

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### **Koppar och kopparlegeringar – Bestämning av manganhalt – Del 1: Spektrofotometrisk metod**

**Copper and copper alloys – Determination of manganese  
content –**

**Part 1: Spectrophotometric method**



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TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 15703-1**

April 2009

ICS 77.040.30; 77.120.30

English Version

**Copper and copper alloys - Determination of manganese  
content - Part 1: Spectrophotometric method**

Cuivre et alliages de cuivre - Dosage du manganèse -  
Partie 1: Méthode spectrophotométrique

Kupfer und Kupferlegierungen - Bestimmung des  
Mangangehaltes - Teil 1: Spektrophotometrisches  
Verfahren

This Technical Specification (CEN/TS) was approved by CEN on 1 March 2009 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

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## Foreword

This document (CEN/TS 15703-1:2009) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This is one of two parts of the standard/technical specification for the determination of manganese content in copper and copper alloys. The other part is:

— prEN 15703-2, *Copper and copper alloys — Determination of manganese content — Part 2: Flame atomic absorption spectrometric method (FAAS)*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This part of this Technical Specification specifies a spectrophotometric method for the determination of the manganese content of copper and copper alloys in the form of castings or unwrought or wrought products.

The method is applicable to products having manganese mass fractions between 0,025 % and 6,25 %.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1811-1, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 1: Sampling of cast unwrought products*

ISO 1811-2, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 2: Sampling of wrought products and castings*

## 3 Principle

Dissolution of a test portion in fluoroboric-nitric acid mixture. Oxidation of manganese to permanganic acid by potassium periodate. Spectrophotometric determination in comparison with a background colour prepared by selective reduction of permanganic acid by sodium nitrite.

## 4 Reagents and materials

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

### 4.1 Boric acid, $\text{H}_3\text{BO}_3$ (40 g/l solution)

### 4.2 Nitric acid, $\text{HNO}_3$ ( $\rho = 1,40$ g/ml)

### 4.3 Nitric acid solution (1 + 3)

Add 25 ml of nitric acid (4.2) to 75 ml of water.

### 4.4 Hydrofluoric acid, HF 40 % ( $\rho = 1,14$ g/ml)

**WARNING — Hydrofluoric acid is a hazardous substance. Care shall be taken and it shall be used under an efficient fume hood.**

### 4.5 Sulphuric acid, $\text{H}_2\text{SO}_4$ ( $\rho = 1,84$ g/ml)

### 4.6 Sulphuric acid solution (1 + 3)

Add 25 ml of sulphuric acid (4.5) to 75 ml of water.