

Non-destructive testing — X-ray diffraction from polycrystalline and amorphous materials —

Part 1: General principles

The European Standard EN 13925-1:2003 has the status of a
British Standard

ICS 19.100

Confirmed December 2008

National foreword

This British Standard is the official English language version of EN 13925-1:2003.

The UK participation in its preparation was entrusted to Technical Committee WEE/46, Non-destructive testing, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 20 March 2003

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 13 and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

Amendments issued since publication

Amd. No.	Date	Comments

© BSI 20 March 2003

ISBN 0 580 41463 9

English version

Non-destructive testing - X-ray diffraction from polycrystalline and amorphous material - Part 1: General principles

Essais non destructifs - Diffraction des rayons X appliquée
aux matériaux polycristallins et amorphes - Partie 1:
Principes généraux

Zerstörungsfreie Prüfung - Röntgendiffraktometrie von
polykristallinen und amorphen Materialien - Teil 1:
Allgemeine Grundlagen

This European Standard was approved by CEN on 14 November 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions.....	5
4 General principles of X-ray powder diffraction (XRPD)	6
5 Meaning of the word “powder” in terms of X-ray diffraction	7
6 Characteristics of powder diffraction line profiles.....	7
7 Types of analysis	8
7.1 General.....	8
7.2 Phase identification (also referred to as “Qualitative phase analysis”)	8
7.3 Quantitative phase analysis.....	8
7.4 Estimation of the crystalline and amorphous fractions	9
7.5 Determination of lattice parameters	9
7.6 Determination of crystal structures	9
7.7 Refinement of crystal structures.....	9
7.8 Characterisation of crystallographic texture	9
7.9 Macrostress determination	10
7.10 Analysis of crystallite size and microstrain	10
7.10.1 General.....	10
7.10.2 Determination of crystallite size (size of coherently scattering domains)	11
7.10.3 Determination of microstrains.....	11
7.11 Electron radial distribution function (RDF)	11
8 Special experimental conditions	11
Annex A (informative) Relationships between the XRPD standards	12
Bibliography	13

Foreword

This document (EN 13925-1:2003) has been prepared by Technical Committee CEN/TC 138 "Non-destructive testing", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

This European Standard about "Non-destructive testing - X-ray diffraction from polycrystalline and amorphous material" is composed of:

- EN 13925-1 Part 1: General Principles;
- EN 13925-2 Part 2: Procedures;
- prEN 13925-3 Part 3: Instruments;
- prEN 13925-4 Part 4: Reference Materials.

In order to explain the relationship between the topics described in the different Standards, a diagram illustrating typical operation involved in XRPD is given in annex A.

Annex A is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.