INTERNATIONAL STANDARD

ISO 14922-4

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1999-06-15

Thermal spraying — Quality requirements of thermally sprayed structures —

Part 4: Elementary quality requirements

Projection thermique — Exigences qualité des constructions obtenues par projection thermique —

Partie 4: Exigences qualité élémentaires

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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

Attention is drawn to the possibility that some of the elements of this part of ISO 14922 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14922-4 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 5, *Thermal spraying*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

ISO 14922 consists of the following parts, under the general title *Thermal spraying — Quality requirements of thermally sprayed structures*:

— *Part 1: Guidance for selection and use*

— *Part 2: Comprehensive quality requirements*

— *Part 3: Standard quality requirements*

— *Part 4: Elementary quality requirements*

Annex ZA provides a list of corresponding International and European Standards for which equivalents are not given in the text.

Contents

Foreword

The text of EN ISO 14922-4:1999 has been prepared by Technical Committee CEN/TC 240 "Thermal spraying and thermally sprayed coatings", the secretariat of which is held by DIN**,** in collaboration with Technical Committee ISO/TC 107 "Metallic and other inorganic coatings".

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 December 1999, and conflicting national standards shall be withdrawn at the latest by December 1999.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies requirements so that:

– It is independent of the type of the thermally sprayed structure.

– It defines quality requirements for thermal spraying both in workshops and on site.

– It provides guidance for describing a manufacturer´s capability to produce thermally sprayed constructions to meet specified requirements.

– It may also be used as a basis for assessing the manufacturer in respect to his thermal spraying capability.

This standard is appropriate when demonstration of a manufacturer´s capability to produce thermally sprayed construction, fulfilling specified quality requirements, are specified in one or more of the following:

– a contract between involved parties;

– an application standard;

– a regulatory requirement.

The requirements contained within this standard may be adopted in full or may be selectively deleted by the manufacturer if not applicable to the construction concerned. They provide a flexible framework for the control of thermal spraying in the following cases:

– Case 1

To provide specific requirements for thermal spraying in contracts which require the manufacturer to have a quality system other than EN ISO 9001 or EN ISO 9002.

– Case 2

To provide specific requirements for thermal spraying in contracts which require the manufacturer developing a quality system.

– Case 3

To provide specific requirements for thermal spraying in application standards which uses thermal spraying as part of its requirements or in a contract between relevant parties.

2 Normative references

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 473
Non-destructive testing – Qualification and certification of personnel

EN 582
Thermal spraying – Determination of the adhesive tensile strength

EN 657
Thermal spraying – terminology – Classification

EN 1274
Thermal spraying – Powders – Composition – Technical supply conditions

EN ISO 9001
Quality systems – Model for quality assurance in design/development, production, installation and servicing (ISO 9001 : 1994)

EN ISO 9002
Quality systems – Model for quality assurance in production, installation and servicing (ISO 9002 : 1994)

prEN ISO 14919
Thermal spraying – Wires, rods and cords for flame and arc spraying – Classification – Technical supply conditions

EN ISO 14922-1
Quality requirements of thermally sprayed structures – Part 1: Guidelines for selection and use

ISO 8402 : 1994
Quality management and quality assurance – Vocabularity

3 Definitions

For the purposes of this standard definitions given in EN 657 and listed in part 1 of this standard apply.

4 Contract and design review

4.1 General

The manufacturer shall review the contractual requirements and the design data provided by the purchaser or in-house data for construction designed by the manufacturer. This is to ensure that all information necessary to carry out the fabrication operations is available prior to the commencement of the work. The manufacturer shall affirm his capability to meet all thermal spraying contract requirements and ensure adequate planning of all quality related activities.

4.2 Application – Contract review

Contractual requirements to be considered should include:

a) the application standard to be used, together with any supplementary requirements;

b) inspection and testing;

c) final testing;

d) environmental conditions relevant to thermal spraying on site;

e) sub-contracting,

f) handling of non-conformance.

4.3 Application – Design review

Design requirements to be considered should include:

a) location, accessibility and sequence of all coatings;

b) surface finish of the coating;

c) substrate material specification and coating properties;

d) dimensions and details of prepared substrate surfaces and sprayed coatings;

e) quality and acceptance requirements for coatings.

5 Sub-contracting

Any sub-contractor shall work under the order and responsiblity of the manufacturer and shall fully comply with the relevant requirements of this standard.

6 Personnel for thermal spraying

6.1 General

The manufacturer shall have at his disposal sufficient and competent personnel for the planning, performing, supervising and examining of the thermal spraying production according to specified requirements.

6.2 Qualified thermal sprayer

The entire personnel for thermal spraying must be introduced/instructed.

6.3 Thermal spraying coordinator

The manufacturer shall have at his disposal personnel who controls the correct performing of the thermal spraying work.

7 Personnel for quality testing

7.1 General

The manufacturer shall have at his disposal sufficient and competent personnel for performing the quality testing.

7.2 Non-destructive testing

The non-destructive testing personnel should be approved according to EN 473.

8 Equipment

8.1 Equipment for manufacturing

The following equipment shall be available when necessary:

– workshops, generally as roofed working sites;

– stores for correct storage of substrate materials (to be coated components), consumables and other additives for thermal spraying;

– equipment for drying spray powders;

– equipment and machines to prepare and machine the components for thermal spraying (e.g. degreasing equipment, sand blasting cabins);

– spraying equipment, including equipment for supply, setting and control;

– handling systems (e.g. turntables, turning machines, robot systems);

– exaust systems, dust filters, protective means against noise and radiation;

– equipment for thermal treatment of the components before and after spraying;

– cooling equipment;

– machines, tools and equipment for post treatment of thermal sprayed coatings (e.g. grinding, turning).

8.2 Health and safety and environmental aspects

Equipment necessary for health and safety and environmental protection must be available. All necessary activities to assure standards of health and safety and of emission have to be conducted.

9 Thermal spraying activities

Thermal spraying shall be performed in accordance with an appropriate spraying procedure.

10 Consumables for thermal spraying

Responsibilities and procedures involved in the control of thermal spraying consumables shall be specified by the manufacturer.

11 Storage and handling of substrate materials

Storage shall be such that the material will not be adversely affected. Identification shall be maintained during storage.

12 Thermal spraying related inspection and testing

12.1 Inspection and testing before thermal spraying

Before the start of thermal spraying, the following shall be checked, when necessary:

– suitability and validity of the thermal sprayer´s certificate;

– suitability of thermal spraying procedure specification;

– identity of the substrate material;

– identity of the consumables, e.g. according to EN 1274;

– surface preparation, also shape and dimension;

– fit-up, jigging and tacking;

– any special requirements in thermal spraying procedure specification, e.g. prevention of distortion;

– arrangement of any production test;

– suitability of working conditions for thermal spraying, including environment.

12.2 Inspection and testing after thermal spraying

After thermal spraying, the compliance with relevant acceptance criteria shall be checked, when necessary.

13 Non-confomance and corrective actions

Measures shall be implemented to control items which do not conform to specified requirements in order to prevent their inadvertent use. When repair and/or thermal re-spraying is undertaken by the manufacturer, appropriate prodedures shall be available at all workstations where these activities are performed. When repair or thermal re-spraying is performed, the items shall be re-inspected, tested and examined in accordance with the original requirements. Measures shall also be implemented to ensure that conditions adverse to quality of the thermally sprayed construction are promptly identified and corrected.

14 Calibration

The manufacturer shall be responsible for the appropriate calibration of the inspection, measuring and testing equipment. All equipment used to assess the quality of the sprayed construction shall be suitably controlled and shall be calibrated at specified intervals.

15 Identification and traceability

Identification and traceability shall be maintained throughout the manufacturing process, where appropriate.

16 Quality records

Quality records shall be retained for a minimum period of 5 years in the absence of any other specified requirements.

Annex ZA (informative)

Bibliography

Table ZA.1: List of ISO standards conforming to the EN standards quoted in clause 2

EN standards quoted in clause 2	Corresponding ISO standards	Title of the ISO standard
EN 473	–	
EN 582	ISO 14916	Thermal spraying – Determination of tensile adhesive strength
EN 657	ISO 14917	Thermal spraying – Terminology, classification
EN 1274	ISO/DIS 14232	Thermal spraying – Powders – Composition – Technical supply conditions

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