
**Thermal spraying — Quality requirements
of thermally sprayed structures —**

**Part 3:
Standard quality requirements**

*Projection thermique — Exigences qualité des constructions obtenues par
projection thermique —*
(Partie 3: Exigences qualité standard)

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Printed in Switzerland

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 14922-3 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).

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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.

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Foreword

The text of EN ISO 14922-3:1999 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.

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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. It may however be more appropriate for EN ISO 14922-4 to be used in such cases.

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

ISO 14922-3:1999(E)

EN 1274

Thermal spraying – Powders – Composition – Technical supply conditions

prEN 13214

Thermal spraying – Thermal spray coordination – Tasks and responsibilities

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)

EN ISO 14918

Thermal spraying – Approval testing for thermal sprayers

prEN ISO 14919

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

EN ISO 14922-1

Thermal spraying – Quality requirements of thermally sprayed structures – Part 1: Guidelines for selection and use

ISO 8402 : 1994

Quality management and management assurance – Vocabulary

3 Definitions

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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

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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.

The items in 4.2 are typically considered at or before time of the contract review. The items in 4.3 usually form part of the design review and should be taken into account during the contract review if the design is not carried out by the manufacturer. It shall be ensured that all relevant information has been supplied by the purchaser.

When a contract does not exist, e.g. items made for stock, the manufacturer is required to take into consideration the requirements of 4.2, whilst carrying out his design review (4.3).

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) the specification of thermal spraying procedures, non-destructive testing procedures and heat treatment procedures;
- c) the approval of personnel, if contractual agreed;
- d) inspection and testing;
- e) quality control arrangements, including any involvement of an independent inspection body;

- f) identification;
- g) environmental conditions relevant to thermal spraying on site;
- h) sub-contracting;
- i) 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, masking;
- e) quality and acceptance requirements for coatings;
- f) other special requirements, e.g. acceptability of shotpeening, heat treatment, cooling.

5 Sub-contracting

When a manufacturer intends to use sub-contracted services (e.g. inspection, non-destructive testing, post treatment) all relevant specifications and requirements shall be supplied by the manufacturer to the sub-contractor. The subcontractor shall provide such records and documentation of his work as may be specified by the manufacturer.

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

The information to be provided by the manufacturer to the sub-contractor shall include all relevant data from the contract review (see 4.2) and the design review (see 4.3). Additional requirements may need to be specified, if the design of a structure is to be sub-contracted.

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

All thermal sprayers must be approved by a suitable qualification test according to EN ISO 14918. All records of approval shall be maintained up to date.

6.3 Thermal spraying coordinator

The manufacturer shall have at his disposal appropriate thermal spraying coordination personnel who controls the correct performing of the work. Such persons having responsibility for quality activities shall have sufficient authority to enable any necessary action to be taken. The duties, inter-relationships and limits of responsibility of such persons should be clearly defined, see prEN 13214.