

SVENSK STANDARD

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**Termisk sprutning – Komponenter med termiskt sprutade
beläggningar – Procedurdatablad för termisk sprutning**

**Thermal spraying – Components with thermally sprayed
coatings – Thermal spray procedure specification**

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Denna standard är framtagen av kommittén för AGS 448 Termisk sprutning, SIS/TK 134/AG 08.

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EUROPEAN STANDARD

EN 17002

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2018

ICS 25.220.20

English Version

Thermal spraying - Components with thermally sprayed coatings - Thermal spray procedure specification

Projection thermique - Éléments traités par projection thermique - Spécification de mode opératoire de projection thermique

Thermisches Spritzen - Bauteile mit thermisch gespritzten Schichten - Spritzanweisung

This European Standard was approved by CEN on 9 April 2018.

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European foreword

This document (EN 17002:2018) has been prepared by Technical Committee CEN/TC 240 “Thermal spraying and thermally sprayed coatings”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

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Introduction

Thermal spraying processes are used extensively to produce coatings for industrial products, primarily for preventative protection of surfaces. This is the case for production in the factory and on construction sites. Thermal spraying is one of the special processes in which the quality of the coating cannot be determined unambiguously via testing without destroying the component.

Conditions and the process should be monitored for appropriate use of thermally sprayed coatings and to avoid extensive quality and cost issues in production and operation. The manufacturer of the coating should have a functioning quality assurance system, and usually a quality management system as well (e.g. according to EN ISO 9001).

Therefore, thermal spray procedure specifications should be documented as required in standards for quality systems e.g. EN ISO 14922-1 to EN ISO 14922-4. This will assist in achieving the appropriate basis for quality assurance during spray-coating production. Proof that the specifications are observed should be available.

1 Scope

The thermal spray procedure specification (TSPS) is a critically important quality assurance document in the production workflow when producing a thermally sprayed coating.

This document defines the minimum requirements to be followed for the content of a thermal spray procedure specification. When using the thermal spray procedure specification, the requirements of the coating specification are intended to be met. To ensure traceability, the thermal spray procedure specification is intended to be documented and component-related.

Tests and test scopes are intended to be defined by the manufacturer of the coating in a separate test plan according to the requirements of the coating specification.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN ISO 12670, *Thermal spraying — Components with thermally sprayed coatings — Technical supply conditions (ISO 12670)*

EN ISO 14917, *Thermal spraying — Terminology, classification (ISO 14917)*

EN ISO 14922-1, *Thermal spraying — Quality requirements of thermally sprayed structures — Part 1: Guidance for selection and use (ISO 14922-1)*

EN ISO 14922-2, *Thermal spraying — Quality requirements of thermally sprayed structures — Part 2: Comprehensive quality requirements (ISO 14922-2)*

EN ISO 14922-3, *Thermal spraying — Quality requirements of thermally sprayed structures — Part 3: Standard quality requirements (ISO 14922-3)*

EN ISO 14922-4, *Thermal spraying — Quality requirements of thermally sprayed structures — Part 4: Elementary quality requirements (ISO 14922-4)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 14917 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

thermal spray procedure specification

TSPS

procedure specification that contains the parameters required for the component-related application of the thermal spraying process

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3.2 thermal spray procedure qualification TSPQ

qualification of a TSPS by a component-related qualification

Note 1 to entry: E.g. according to EN 15648.

4 Requirements

A thermal procedure specification should be documented for each spray application. This should contain all the production steps necessary for the entire spray process and the applicable required parameters.

The manufacturer of the thermally sprayed coating is responsible for the presence of a valid thermal spray procedure specification for the component and its execution.

5 Technical content of the thermal spray procedure specification

5.1 Preparing the thermal spray procedure specification

The procedure specification shall refer to the coating specification and the design documents, the parts lists, the material data of the base material and spray consumables, the drawings and the test instructions for the component.

If different sprayed coatings are to be applied to the same component, the specific parameters shall be listed for each sprayed coating or separate thermal spray procedure specifications shall be prepared for each case.

If the manufacturer has not prepared a separate test plan, the thermal spray procedure specification shall contain all the necessary tests. In either case this shall take into account the quality assurance systems according to EN ISO 14922-1 to EN ISO 14922-4, and the tests required in the coating specification and the technical supply conditions according to EN ISO 12670.

5.2 Minimum information in the thermal spray procedure specification

- Manufacturer;
- drawing references;
- workpiece designation;
- substrate material;
- designation of the coating specification (requirements);
- thermal spraying process (according to EN ISO 14917);
- designation of the individual sprayed coatings (e.g. bond coat and top coat);
- designation of the spray consumables (e.g. EN ISO 14919);
- spray equipment to be used;
- designation of the spray devices, if required;
- surface preparation, information about the necessary surface cleanliness and roughness;

- information about masking, material, and fixture (if applicable);
- process parameters for all processes:
 - pre-treatment (degreasing, blasting and, if necessary, preheating);
 - thermal spraying (current, voltage, gaseous or liquid fuel, plasma gases, wire or powder feed rate, transport gas, atomiser gas, e.g. compressed air or others);
 - working with corresponding cooling, if applicable;
 - post-treatment (insofar as no separate procedure specifications have been prepared for the pre-treatment and/or the post-treatment);
- robot or manipulator spray programme with revision index, if applicable;
- information about movement speed and movement direction (e.g. cross hatch) for manual spraying;
- coating thickness with permissible tolerances as sprayed;
- information about the sprayed coating test, test scope, and test methods, insofar as there is no separate test plan;
- information about surface post-treatment, e.g. sealing, fusing self-fluxing alloys;
- thermal treatment process, if applicable.

5.3 Process parameters

The thermal spray procedure specification should contain all the process parameters necessary for the complete spray process. The necessary parameters should be determined from spray specimens or taken from comparable applications. A new thermal spray procedure specification should be qualified with its spray parameters according to EN 15648.

5.4 Scope of validity of the thermal spray procedure specification

The scope of validity of the thermal spray procedure specification is defined by the geometry and the material of the component and the coating and by the production processes that are performed (preparation, spraying process, spraying method (manual, semi-automated, fully automated, automatic), post-treatment).

The thermal spray procedure specification can only apply to a single component. However, the scope of validity of the thermal spray procedure specification may be transferred, without re-qualification, to a new thermal spray procedure specification provided the following conditions are met:

- The base material shall have comparable mechanical, metallurgical, physical and chemical properties;
- Changing the required thickness of the sprayed coating has no influence on the spray parameters to be used;
- Changing the geometry of the component has no influence on the spray parameters to be used;
- The state of the component, including all preceding production steps, should be similar;