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Thermal spraying - Acceptance inspection of thermal spraying equipment - Part 3: Arc spraying

Thermisches Spritzen - Abnahmeprüfungen für Anlagen zum thermischen Spritzen - Teil 3: Lichtbogenspritzen

Projection thermique - Contrôle d'acceptation du matériel de projection thermique - Partie 3: Projection a l'arc

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English Version

Thermal spraying - Acceptance inspection of thermal spraying equipment - Part 3: Arc spraying

Projection thermique - Contrôle d'acceptation du matériel de projection thermique - Partie 3: Projection à l'arc

Thermisches Spritzen - Abnahmeprüfungen für Anlagen zum thermischen Spritzen - Teil 3: Lichtbogenspritzen

This European Standard was approved by CEN on 23 December 2006.

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Foreword

This document (EN 1395-3:2007) 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of an identical text or by endorsement, at the latest by July 2007, and conflicting national standards shall be withdrawn at the latest by July 2007.

This document together with EN 1395-1, 1395-2, 1395-4, 1395-5, 1395-6 and 1395-7 supersedes EN 1395:1996.

EN 1395 consists of the following Parts, under the general title *Thermal spraying — Acceptance inspection of thermal spraying equipment*:

— *Part 1: General requirements;*

— *Part 2: Flame spraying including HVOF;*

— *Part 3: Arc spraying;*

— *Part 4: Plasma spraying;*

— *Part 5: Plasma spraying in chambers;*

— *Part 6: Manipulator systems;*

— *Part 7: Powder feed systems.*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: 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 United Kingdom.

1 Scope

This European Standard specifies requirements for the acceptance inspection of thermal spraying equipment, in this case arc spraying, used to produce thermally sprayed coatings of reproducible quality.

This part should be used in conjunction with EN 1395-1, which includes general requirements and explanations of procedures.

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.

EN 657:2005, *Thermal spraying — Terminology, classification*

EN ISO 14919:2001, *Thermal spraying — Wires, rods and cords for flame and arc spraying — Classification — Technical supply conditions (ISO 14919:2001)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 657:2005 apply.

4 Principles of acceptance inspection

4.1 General

The following clauses reveal state of the art technology in thermal spraying equipment and the minimum requirements concerning a stable parameter setting and maintenance as given in Annex A.

4.2 Atomising gas

The atomising gas hoses and the control device shall be designed in such a manner that an undisturbed operation is ensured.

4.3 Arc spraying nozzle

The nozzle system (contact tubes and air nozzle) shall permit a constant arc to be maintained and provide atomisation without causing deposits that might disturb the operation.

4.4 Spraying wire feed unit

A continuously controllable and reproducible feed of the wires shall be provided. A precondition for this is an adequate constant air pressure and supply of electrical power.

5 Procedure of acceptance inspection

5.1 General

Spraying equipment shall be deemed to have been properly supplied for all suitable spraying applications and for use with all suitable spraying materials required for the spraying process if it complies with the following requirements:

5.2 Electrical power and wire feed unit

Proof of the power rating required for continuous operation and of compliance of the feed unit with the requirements as specified in 4.4 shall be deemed to have been provided if:

— no deviations of the adjusted electrical values of more than ± 5 % or other disturbances due to an increased thermal loading occur; and

— system is operating at a maximum capacity for 10 min with a coating material with a suitable diameter:

1) anti-corrosion arc spraying system: zinc aluminium alloy, thermal spray material according to EN ISO 14919:2001, 2.3, or

2) engineering application arc spraying system: pure copper, thermal spray material according to EN ISO 14919:2001, 4.1.

5.3 Atomising gas

The equipment shall be deemed to comply with the requirements of 4.2 if the atomising gas pressure indication does not deviate by more than ± 5 % from the set point over a 10 min period of spraying.

5.4 Arc spraying nozzle

The nozzle system shall be deemed to comply with the requirements given in 4.3 if, after testing according to 4.4, no disturbances occur in the arc and no disturbing deposits have been built up on the nozzle system by more or less molten spraying material.

6 Designation

Acceptance inspection of the thermal spraying equipment for arc spraying shall be designated as follows:

Acceptance inspection according to EN 1395-3.

7 Inspection report

An example for the inspection report is given in Annex A.

Annex A
(informative)

Inspection report for arc spraying equipment (initial test/retest)

The initial test/retest fulfils the requirements of the acceptance inspection according to EN 1395-3.

User:.....

Manufacturer:.....

Year of manufacture: .....

Type of equipment: .....

Type of spraying gun: .....

.....

Spraying wire used for testing ..... Diameter: ..... mm

CE-documentation complete: yes / no

Item tested, where applicable			Full scale	Set point	Change after 10 minute continuous testing			Limit in %	Evaluation	
					actual value		maximum deviation in %		passed	failed
					min.	max.				
Electrical power	Current	A						± 5		
	Voltage	V						± 5		
Atomising gas	Pressure	bar						± 5		
	Flow	Nl/min[1)]						± 5		
Wire feed	Speed	m/min						± 5		
Cooling water	Flow	l/min						± 10		
	temperature to spraying gun	°C						10 °C		

[1)] Referred to temperature 0 °C and normal pressure (1 013,25 hPa).

Deposits: yes / no

Nozzle disturbance: yes / no

Time needed for stabilisation: .....

Automatic energy shutdown: – Lack of gas: yes / no

– Lack of cooling water: yes / no

– Excessive variations in feed: yes / no

Limits of error of measuring instruments: ..... % of set point (max. 5 %)

– Class 2,5 [2]: yes / no

Comments: .....

.....

.....

.....

.....

.....

The thermal spraying equipment has been accepted: yes / no

Date: ..... Inspector's signature: .....

Date: ..... Customer's signature: .....

Date: ..... Supplier's signature: .....

[2] Maximum permissible error expressed by percentage of measuring span.