BRITISH STANDARD

BS EN
1395-7:2007

Thermal spraying — Acceptance inspection of thermal spraying equipment —

Part 7: Powder feed systems

The European Standard EN 1395-7:2007 has the status of a British Standard

ICS 25.220.20

BSI
British Standards

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 1395-7:2007. This standard together with BS EN 1395-1, BS EN 1395-2, BS EN 1395-3, BS EN 1395-4, BS EN 1395-5 and BS EN 1395-6 supersedes BS EN 1395:1996.

The UK participation in its preparation was entrusted to Technical Committee STI/40, Thermally sprayed inorganic finishes.

A list of organizations represented on STI/40 can be obtained on request to its secretary.

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

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Projection thermique - Contrôle d'acceptation du matériel de projection thermique - Partie 7: Systèmes d'alimentation de poudre

Thermisches Spritzen - Abnahmeprüfungen für Anlagen zum thermischen Spritzen - Teil 7: Pulverfördersysteme

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 1395-7:2007) 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of an identical text or by endorsement, at the latest by July 2007, and conflicting national standards shall be withdrawn at the latest by July 2007.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, 1395-3, 1395-4, 1395-5 and 1395-6 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.*

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1 Scope

This European Standard specifies requirements for the acceptance inspection of thermal spraying equipment in the case of powder feed units used in spray jobs 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.

This part should be used in addition to EN 1395-2 when carrying out acceptance inspection for flame and/or HVOF (high velocity oxygen-fuel) spraying equipment, or EN 1395-4 when carrying out acceptance inspection for plasma spraying equipment.

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 1274:2004, *Thermal spraying — Powders — Composition, technical supply conditions*

3 Terms and definitions

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

4 Conditions of acceptance inspection

4.1 General

Clause 4 and clause 5 specify state of the art technology in thermal spraying equipment and the minimum requirements concerning stable parameter settings and maintenance according to the classes given in Annex A.

4.2 Powder feed unit

4.2.1 General

The powder feed unit shall be suitable for operation with the spraying equipment to be tested. This means the carrier gas pressure and flow shall operate under the specific condition of the spraying process, e.g. in the low pressure atmosphere in the chamber or against the high pressure in the combustion chamber of the burner.

The class of the powder feed unit has to correlate with the class of the spraying equipment itself.

The unit shall permit uniform processing of the spraying powder for which it is designed. It shall be possible to adjust the powder feed rate. The set values shall be constant and reproducible, a precondition for this being adequate flow and constant carrier gas pressure or actuating air pressure, as appropriate.

4.2.2 Stand-alone powder feed unit

This type of powder feed unit uses a carrier gas. A change in the primary gas flow of the spraying equipment, as indicated on the control panel, shall not affect the carrier gas flow.

4.2.3 Integrated powder feed unit in flame spraying equipment

This type of powder feed unit uses a part of the main gas stream, e.g. part of oxygen flow inside the burner of the flame spraying equipment for the powder supply. This method of powder supply will mainly be used for manual spraying applications but can also be applied for mechanised ones.

5 Procedure of acceptance inspection

5.1 General

A powder feed unit shall be deemed to have been properly supplied for all suitable applications when using a spraying powder according to EN 1274, agreed between contracting parties, if it complies with the requirements in 5.2 to 5.4.

5.2 Testing of function

The powder feed unit shall comply with the requirements of its specification and/or with the contract confirmation of the supplier.

5.3 Testing the mass flow

In order to determine the mass of powder fed over a given period, the system shall be operated in the "cold run" mode using the carrier gas flow specified by the manufacturer of the device, but without the burner or arc operated for at least 1 min. During this process, which is to be repeated twice more, the variation in the mass of powder fed shall not exceed ± 5 % in Class A or ± 10 % in Class B.

In order to check reproducibility, the same feed rate and deviation shall be achieved after shut-down of the equipment for at least 3 h and recharge using the same amount of the test powder.

5.4 Testing the de-mixing

Testing the de-mixing the powder container shall be filled with approximately 1 000 g of the agreed upon spraying powder. After feeding through approximately 900 g with the equipment in the "cold run" mode, in accordance with the manufacturer's operating instructions, the remaining quantity of about 10 % shall be analysed for its particle size distribution (PSD) according to EN 1274:2004, 3.3.

The maximum deviation caused by de-mixing the powder shall be agreed between the contracting parties.

6 Designation

Acceptance inspection of the powder feed system shall be designated as follows:

Acceptance inspection according to EN 1395-7.

7 Inspection report

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

Annex A
(informative)

Inspection report for a powder feed unit (initial test/retest)

The initial test/retest fulfils the requirements of the acceptance inspection according to EN 1395-7.

User:.....

Manufacturer.....

Year of manufacture: .....

Type of powder feed unit: .....

Type of spraying equipment: .....

Class of spraying equipment:..... .....

Type of spraying gun, if applicable: .....

CE-documentation complete: yes / no

A.1 Function test

The function complies with the specification or contract confirmation, respectively: yes / no

A.2 Set value on the spraying equipment when testing the powder feed unit:

Carrier gas: pressure .....bar; flow .....Nl/min[1)]

A.3 Mass flow inspection test

Spraying powder used for testing: _____

Particle size: _____ according to EN 1274

Feed time: _____ min

Powder feed unit	Set value	1st Test	2nd Test	3rd Test	Limit deviations in %		Actual deviation in %	Evaluation	
					Class A	Class B		Passed	Failed
Mass of powder fed in g/min					± 5	± 10			

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

A.4 Powder de-mixing test – Particle size distribution

Measuring the particle size distribution is carried out by: _____ method

Particle size range	Initial mass		Residual mass		De-mixing		Evaluation	
µm	g	%	g	%	Limit deviation in %	Actual deviation in %	passed	failed

A.5 Measuring equipment capability

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

– Class 2.5 [2)]: yes / no

Comments: .....

.....

.....

.....

.....

.....

The powder feed unit has been accepted as a: – Class A equipment: yes / no

– Class B equipment: yes / no

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

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

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

2) Maximum permissible error expressed by percentage of measuring span.

Bibliography

[1] EN 1395-1, *Thermal spraying — Acceptance inspection of thermal spraying equipment — Part 1: General requirements*

[2] EN 1395-2, *Thermal spraying — Acceptance inspection of thermal spraying equipment — Part 2: Flame spraying including HVOF*

[3] EN 1395-4, *Thermal spraying — Acceptance inspection of thermal spraying equipment — Part 4: Plasma spraying*

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