SLOVENSKI STANDARD
SIST EN 657:1999

01-oktober-1999

Vroče brizganje - Terminologija, razvrstitev

Thermal spraying - Terminology, classification

Thermische Spritzen - Begriffe, Einteilung

Projection thermique - Terminologie, classification

Ta slovenski standard je istoveten z: **EN 657:1994**

ICS:

01.040.25	Izdelavna tehnika (Slovarji)	Manufacturing engineering (Vocabularies)
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EUROPEAN STANDARD **EN 657**

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Descriptors: Thermal spraying, vocabulary, classifications

English version

Thermal spraying - Terminology, classification

Projection thermique - Terminologie, classification

Thermisches Spritzen - Begriffe, Einteilung

This European Standard was approved by CEN on 1994-04-01. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europaisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents list

Foreword

This European Standard was prepared by the Technical Committe CEN/TC 240 "Thermal spraying and thermally sprayed coating" of which the secretariat is held by DIN.

CEN/TC 240 has decided to submit the final draft for formal vote by its resolution. The result was positive.

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of an identical text or by endorsement, at the latest by October 1994, and conflicting national standards shall be withdrawn at the latest by October 1994.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

This Standard defines processes and general terms for thermal spraying. It also classifies the thermal spraying processes according to type of spray material, to type of operation, to type of energy carrier.

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 incorporates in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 582	Thermal spraying -Determination of tensile adhesive strength
ISO 6507-1 : 1982	Metallic materials - Hardness test - Vickers test Part 1: HV 5 to HV 100
ISO 6507-2 : 1983	Metallic materials - Hardness test - Vickers test Part 2: HV 0,2 to less than HV 5
ISO 6508 : 1986	Metallic materials - Hardness test - Rockwell test (scales A-B-C-D-E-F-G-H-K)

3 Definition

For the purpose of this standard the following definitions applies :

Thermal spraying: Thermal spraying comprises processes, in which surfacing materials are heated to the plastic or molten state, inside or outside of the spraying gun/torch, and then propelled onto a prepared surface. The substrate remains unfused.

NOTE 1: Spray coatings could be applied by thermal spraying of material in its liquid or plastic pasty state.

NOTE 2: To obtain specific properties of the deposit, a subsequent thermal mechanical or sealing treatment may be used.

4 Process variations

4.1 Classification according to the type of spray material

Distinction of following variations:

- wire spraying;
- rod spraying;
- cord spraying;
- powder spraying;
- molten-bath spraying.

4.2 Classification according to the operation

4.2.1 Manual spraying

All operations typical of the spraying process are manual.

4.2.2 Mechanized spraying

All operations typical of the spraying process are mechanized.

4.2.3 Automatic spraying

All operations typical of the spraying process are fully mechanized including all handling (e.g. workpiece loading and unloading) and are integrated in a programmed system.

4.3 Classification according to the energy carrier

4.3.1 Molten-bath spraying

A surfacing material is heated to the molten state, in most cases in a reservoir, and propelled onto the prepared substrate by a preheated atomizing gas (e.g. compressed air) (see figure 1).

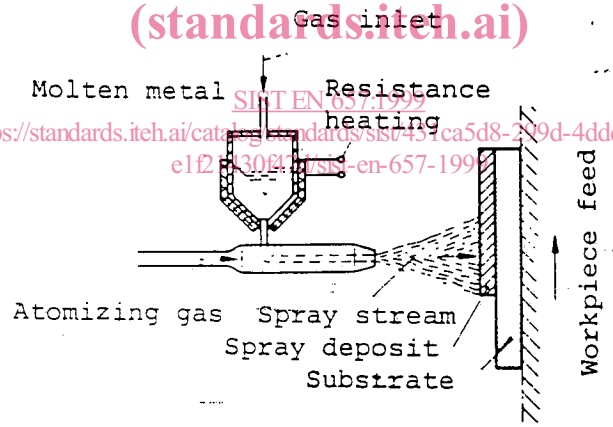

Figure 1: Molten-bath spraying

4.3.2 Flame spraying

Flame spraying is a process in which a surfacing material is heated in an oxyfuel gas flame and then propelled in atomized form onto a substrate. The material may be initially in the form of powder, rod, cord, or wire. The hot material is projected onto the substrate by the oxyfuel gas jet alone or with the additional aid of an atomizing gas, e.g. compressed air.

4.3.2.1 Wire flame spraying

In wire flame spraying the metal wire to be deposited is supplied to the gun continuously. It is heated to the molten state by the oxyfuel gas flame and propelled onto the prepared substrate surface by the additional aid of an atomizing gas, e.g. compressed air (see figure 2).

The fuel gases predominantly used are e.g. acetylene, propane, and hydrogen.

Variations are rod flame spraying, where cut lengths of material rod is used, and cord flame spraying, where cords of surfacing material is used.

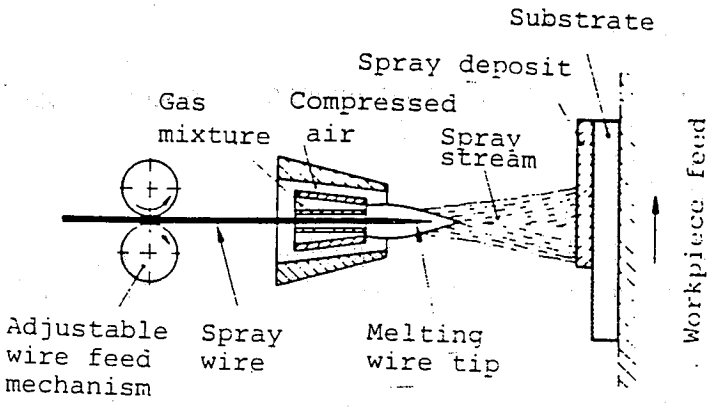

Figure 2: Wire flame spraying

4.3.2.2 Powder flame spraying

With this method the material to be sprayed is supplied to the gun in powder form and heated to the plastic or molten state in the oxyfuel gas flame. It is propelled onto the prepared substrate by the expanding fuel gases. In some cases, an additional gas jet may be used to accelerate the powder particles (see figure 3).

The fuel gases commonly used are acetylene, propane, and hydrogen.

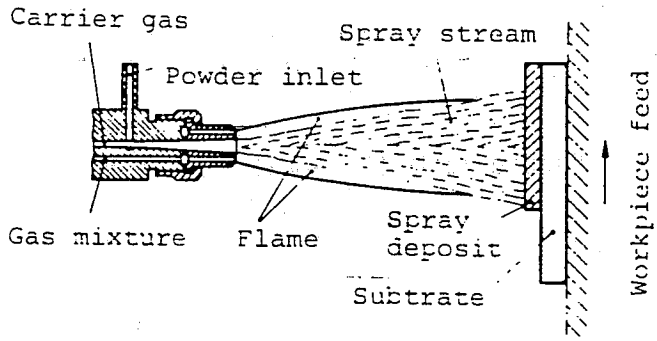

Figure 3: Powder flame spraying

4.3.3 High velocity flame spraying

In high velocity flame spraying continuous combustion is obtained in a combustion chamber.

The high pressure generated in the chamber, in conjunction with an expanding nozzle at the chamber outlet, produce a particularly high velocity of flow in the gas jet. Material is fed into the high velocity gas stream, ensuring a rapid acceleration of the particles (see figure 4).

Fuel gases, such as acetylene, propane, propylene, methylacetylene-propadiene, and hydrogen may be used and liquid fuels such as diesel or kerosene may also be used.

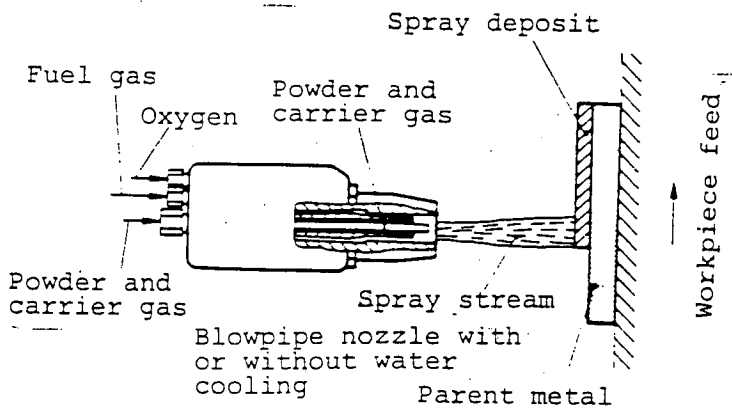

Figure 4: High velocity flame spraying

4.3.4 Detonation spraying

In detonation spraying the gun contains a chamber into which are injected certain quanties of a powder. The gas mixture in the chamber is detonated at controlled intervals. This creates a hot, high velocity gas stream that heats the powder to its plastic or molten state and accelerates the particles as they leave the gun barrel.

The so-called "detonation gun" consists of this barrel and the gun chamber. The injected gas and powder mixture is detonated by an electric spark. The resulting shock wave generated in the barrel accelerates the particles, which are further heated in the flame front and are propelled in a directed jet onto the prepared substrate. Nitrogen is used to flush clean gun chamber and barrel after every detonation (see figure 5).

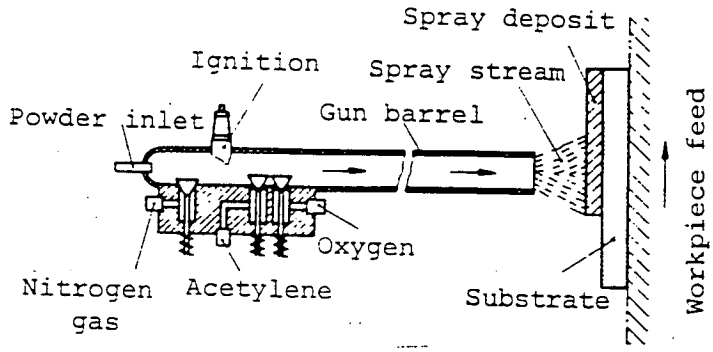

Figure 5: Detonation spraying