Thermal spray

Description

Thermal Spray is a **surface coating** process that allows the deposition of metallic or ceramic materials onto the surface of a component in order to **improve its mechanical performance, wear resistance, oxidation resistance, corrosion resistance, as well as design**.
By means of dedicated torches (APS or HVOF), the feedstock material is semi-melted in a plastic state and projected onto the substrate, forming a coating with a dense, adherent, and highly functional lamellar structure.

Process

The Eurolls Thermal Spray process uses a **hybrid system** equipped with two technologies:

HVOF (High Velocity Oxygen Fuel)

It uses high-pressure combustion of oxygen and kerosene to accelerate material particles to supersonic velocities. The result is a coating with **low porosity** (~1%), extremely dense and compact, with minimal oxidation, characterized by **high adhesion and surface hardness**.
This technology is generally used for **carbide overlays**.

APS (Air Plasma Spray)

It involves the use of a plasma jet (mixture of hydrogen + inert gas Argon + electricity) at very high temperature (up to 15,000 °C at the flame core), in which the feedstock material is semi-melted and projected onto the workpiece.
It allows the deposition of ceramic and metallic materials, ideal for applications requiring **thermal barriers, surface protection at high temperatures, and wear resistance** (for plastic components, Teflon, and yarns).

Highlights

HVOF (High Velocity Oxygen Fuel)

- High coating density and adhesion
- Minimal oxidation and reduced porosity
- Ideal for protection against wear and corrosion
- Very smooth surfaces, excellent for mechanical couplings

APS (Air Plasma Spray)

- Higher process temperatures
- Possibility of applying ceramic materials and thermal barriers
- Greater coating thickness
- Excellent resistance to oxidation and thermal shock

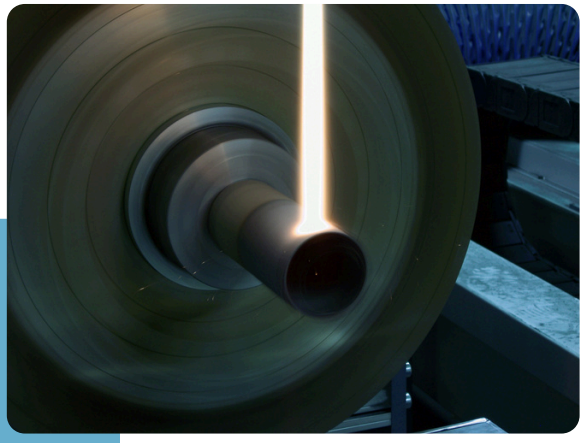
Applications

- Rolls and cylinders subject to wear or corrosion
- Mechanical components and rotating shafts
- Valves, seats, and pistons
- Molds, tools, and precision components
- Parts subjected to high thermal or abrasive stress

Coating	Powder	Hardness [HV]	Thickness [mm]	Charateristics
EU_Aluoxide	Aluminium oxide	1100	0,05 – 0,40	Good wear resistance, thermal and electrical insulating properties. Stable at high temperatures, relatively brittle.
EU_Alutitaniumoxide	Aluminium titanium oxide	1000	0,05 – 0,40	Hard but tougher than pure alumina. Excellent resistance to abrasion/erosion and good resistance to thermal shock.
Eu_Chromeoxide	Chromium oxide	1300	0,10 - 0,40	Extremely hard, excellent for sliding wear applications. Low friction, good resistance to corrosion/oxidation.
Eu_Bronze	Bronze	300	0,10 – 3,00	Soft and ductile. Anti-seizing coating.
Eu_Tungstencarbide	Tungsten carbide	1450	0,03 – 0,80	Extremely hard, maximum resistance to abrasion/erosion.
Eu_Wccrcarbide	Tungsten chromium carbide	1350	0,03 – 0,80	High hardness with excellent combined wear and corrosion resistance.
Eu_Chromecarbide	Chromium carbide	1100	0,03 – 0,60	Ideal for high-temperature wear applications. Excellent resistance to oxidation/corrosion and good toughness.

Technical Data

- Maximum flat area: 1,500 × 6,000 mm
- Maximum outer diameter: 1,500 mm
- Maximum length: 6,300 mm
- Maximum weight: 6,000 kg



Treatable Materials

- Carbon and alloy steels
- Stainless steels
- Hardened or nitrided steels
- Cast irons
- Superalloys (Ni, Co, Inconel)
- Aluminum
- Bronze

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