

# IZADI-NANO2INDUSTRY

The entry point  
for nano-enabled products to go to  
market

*SOLID DEPOSITION OF NANOSTRUCTURED COATINGS*

*Euronanoforum 2017 Conference  
June 21st 2017*

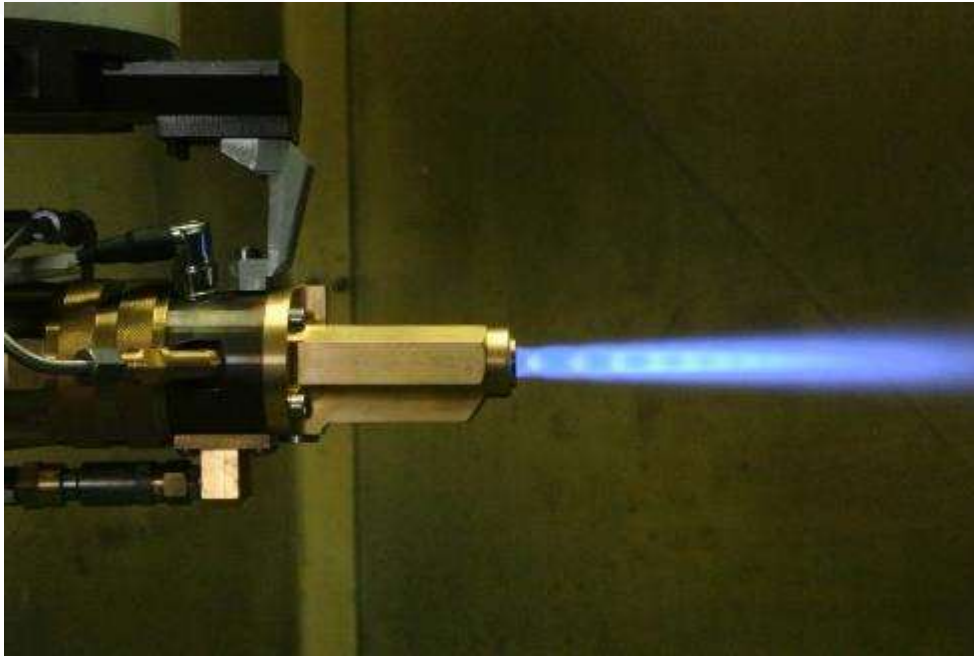


# The problem

- **Adopting cost effective and more efficient manufacturing processes** for coating metal parts (less resources consumption: material, energy, personnel)
- **Improving the durability of mechanical components** through well bonded and superhard wear resistant coatings
- **Increase performances of the metal components (fatigue life)** into the part to be coated and less penalty on critical mechanical properties (fatigue life)
- **Reducing finishing** process steps (coating)

# THE SOLUTION

**COST-EFFECTIVE** industrial process to **IMPROVE DURABILITY** and **INCREASE EFFICIENCY**



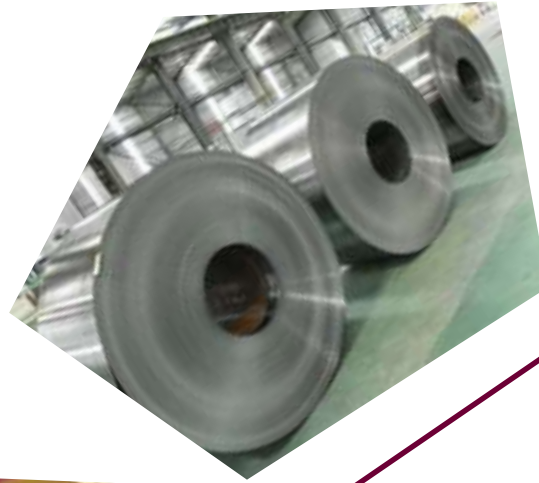
**HVO/AF thermal spray technology for solid state deposition of high quality metal and cermet base coatings**

Key enabling technology to process:  
low process temperature + low  
thermal input into the component to  
the part to be coated

**Nanostructured powders for metallic cermet coatings**

# Fields of application: some examples

**Metal Industry**



**Petrochemical Industry**

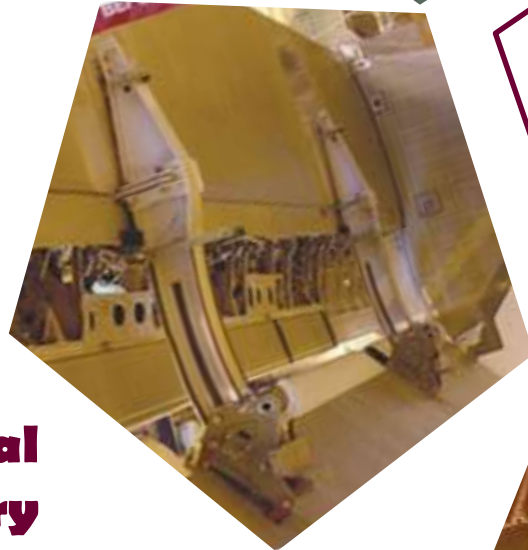


**HVO/AF  
spraying system**

**Hydroturbine Industry**



**Aeronautical Industry**



**Paper Industry**



# Applications in the Metal Industry



## Metal sheet roll forming

HVOAF WCCoCr coatings

## Main Benefits



Higher process productivity: long lasting coating enabling less MRO Maintenance, repair and overhaul needs.



Reduction of post processing steps (finishing) because of the low coating roughness



# Applications in the Hydroturbine Industry- hydroelectric generation



## Kaplan turbines

HVOAF WCCoCr coatings

## Pelton turbines – Needle control

HVOAF WCCoCr coatings



## Main Benefit

Best erosion resistant coating to longer life-time of hydro components

# Applications in the Paper Industry



## Corrugated rolls

HVOAF WCCoCr coatings

## Doctor blades

HVOAF WCCoCr and Cr<sub>3</sub>C<sub>2</sub>-NiCr coatings



## Main Benefit:

Improved production of paper with long lasting doctor blades coated with nanocarbide layer

# Applications in the Petrochemical Industry



**Ball valves**  
HVOAF WCCoCr coatings



## Main Benefits:

Best wear resistance for improved durability



# Applications in the Aeronautical Industry



## Flap tracks

HVOAF WCCoCr



### Main Benefit:

Durability of flaps with harder wear resistant coatings



Engine shaft

Bearing mounting area

## Turbine shaft

HVOAF WCCoCr

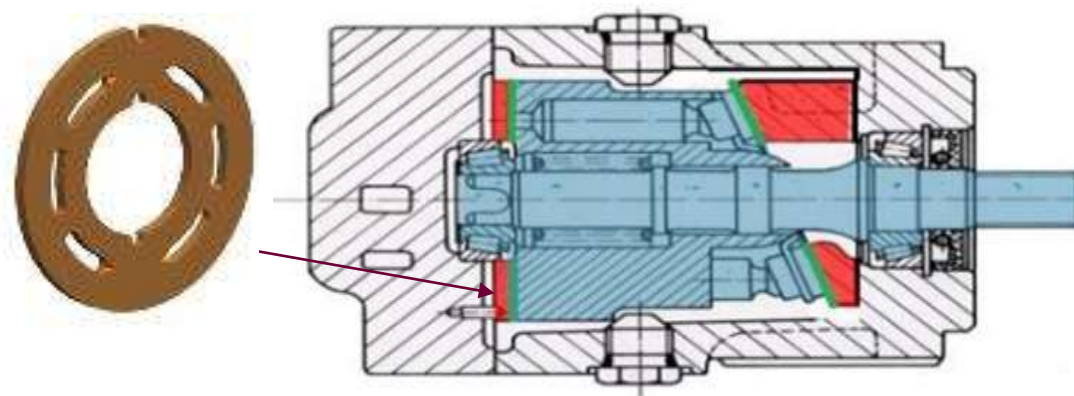


### Main Benefit:

Improved fretting-fatigue resistance of coated component

# Validated solution - HYDRAULIC MOTOR SECTOR

- Power loss reduction
- Bonfiglioli Riduttori, end-user, allows us to demonstrate the technology at industrial level



# HYDRAULIC MOTOR SECTOR

## Provided Benefits



**INCREASED COMPONENTS' LIFETIME**

.....  
+15/20% in wear resistance



**REDUCTION OF PARTS' MACHINING**

.....  
-20% of costs associated to the finishing of the component



**REDUCTION OF MECHANICAL FRICTION LOSSES**

.....  
-15%



**REDUCTION OF RAW MATERIAL USE**

.....  
-15%

# Business Model

## ➡ Sell of licenses to end-user / OEMs

- **Partnership with thermal spray equipment suppliers**
  - We provide the main equipment
  - Peripheral equipment to be provided by the thermal spray equipment suppliers
- **Partnership with fine feedstock powders suppliers**

## ➡ Other approaches will be considered depending on each individual case



# The Team

**Early Adopter**



**Thermal Spray  
Equipment  
Suppliers**

**Technology Provider**



**Nanostructured  
Powders Producer**





## Be with us

Improve your coating processes with our novel more efficient technology



**Customers in industrial sectors different than the hydraulic motor sector**

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