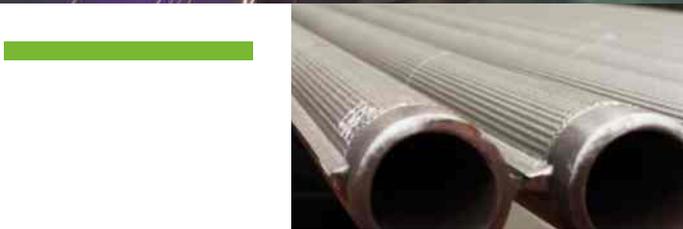




**Plasma System**  
Technology of benefits

COMPANY BROCHURE

# Innovative protective coatings for industry





# Who we are?



Plasma System S.A. is an advanced technology company specialising in surface engineering and laser technology.

For over 20 years, we have been specialising in surface engineering with the use of innovative technologies and participating in the largest investment projects in the energy, metallurgy and mining industries.

Using advanced technologies of laser cladding and hardening, and coating spraying, supported by many years of experience and expertise of our staff:

- ▶ **WE MANUFACTURE**  
parts for machines and devices which are characterised by high resistance to wear and tear
- ▶ **WE MODERNISE**  
machines and devices, significantly increasing their durability and reliability
- ▶ **WE RESTORE AND IMPROVE**  
the properties of damaged or worn components.

Our protective coatings are used in all industry sectors, and are regularly verified in the most difficult operating conditions, providing our clients with measurable economic benefits.

We have gained the trust of the leading companies on the market which have entrusted us with their most demanding projects.

Let us know how we can help you.

# A proven partner in the field of industrial protective coatings

Plasma System offers innovative solutions in the field of professional protective coatings using laser technology.

Thanks to close cooperation with our clients and extensive development research, we have managed to create and patent our own protective coatings with unprecedented parameters while maintaining an attractive level of investment.

**Over 28 000 m<sup>2</sup> of our protective coatings protect the key industrial processes of our clients.**



## HIGHRESIST®

### TYPE OF COATING:

Anti-corrosive / Anti-erosion

### APPLICATION:

- ▶ Pulverized coal-fired boilers + 20% biomass with low-emission burners
- ▶ Installations where gas corrosion occurs
- ▶ Good erosion resistance in the area of burner bending, OFA nozzles



## PLASMADUR®

### TYPE OF COATING:

Anti-erosion

### APPLICATION:

- ▶ Fluidized bed boilers and pulverized boilers
- ▶ Axial fan blades
- ▶ Region of burner bending
- ▶ Power hydraulics
- ▶ Air and dust burners



## PROTECTOR®

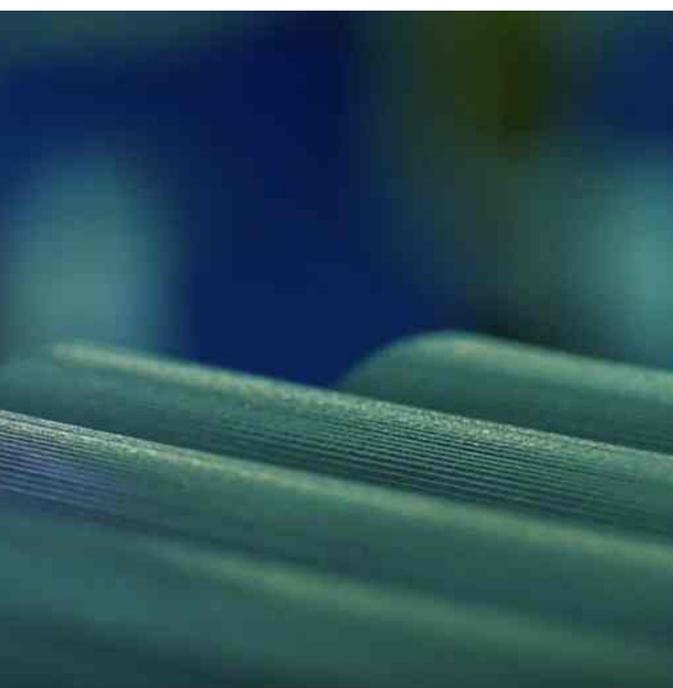
### TYPE OF COATING:

Anti-corrosive / Anti-erosion

### APPLICATION:

- ▶ Heat exchangers
- ▶ Superheaters
- ▶ Area of steam blowers
- ▶ Air, water, etc. heaters

# eld atings



## INCONEL 625

### TYPE OF COATING:

Anty-corrosion

### APPLICATION:

- ▶ Municipal waste utilisation plants (WTE)
- ▶ Pressure elements working in corrosive environments

### COATING MATERIALS:

#### ▶ PURE METALS, ALLOYS, MIXTURES:

**Babbit**, Mo, Co, Ti, Cu, Al, Zn, Ni, NiAl, NiCr, CuAlFe, FeCrSi, SnSbCu

#### ▶ CERAMIC MATERIALS:

Al<sub>2</sub>O<sub>3</sub>+XTiO<sub>2</sub>, ZrO<sub>2</sub>+XY<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub>, ZrO<sub>2</sub>+Y<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>

#### ▶ CARBIDE AND CEMENT MATERIALS:

WC, Cr<sub>3</sub>C<sub>2</sub>, Cr<sub>3</sub>C<sub>2</sub>-NiCr, BC, TiC, WC-CoCr, Al<sub>2</sub>O<sub>3</sub>-NiAl

#### ▶ SPECIAL ALLOYS AND COMPOSITE MATERIALS

**Highresist**<sup>®</sup>, **Stellit**, **Plasmadur**<sup>®</sup>, **Inconel 625**, CoNiCr, NiCrAlMo, MCrAlY, NiCoCrAlY, CoNiCrW, NiCrTi, FeCrB

#### ▶ SELF-FLUXING MATERIALS

NiCrSiB, NiCrMoCuBS, NiCrSiB-WCCo, CoNiCrMoSiBFeC, CoCrWSiC.

### MATERIALS AND SUBSTRATES

- ▶ low and high-alloys steels,
- ▶ cast steel, cast iron, metallic materials,
- ▶ ceramic materials,
- ▶ plastics.

„ We are able to create protective coatings tailored to your individual needs”

# Our technologies and experience

Plasma System has been producing specialised protective coatings for years with the use of innovative laser technologies.

As one of the few companies on the market, Plasma System S.A. possesses the necessary technological facilities and qualified engineering staff guaranteeing effective completion of even the most demanding tasks.

For over 20 years, we have successfully completed numerous complex projects, thus gaining unique knowledge and experience on the market.

Coatings made by Plasma System S.A. are suitable for all branches of industry, ensuring safety in key industrial processes for our clients.



## Thermal spray technologies

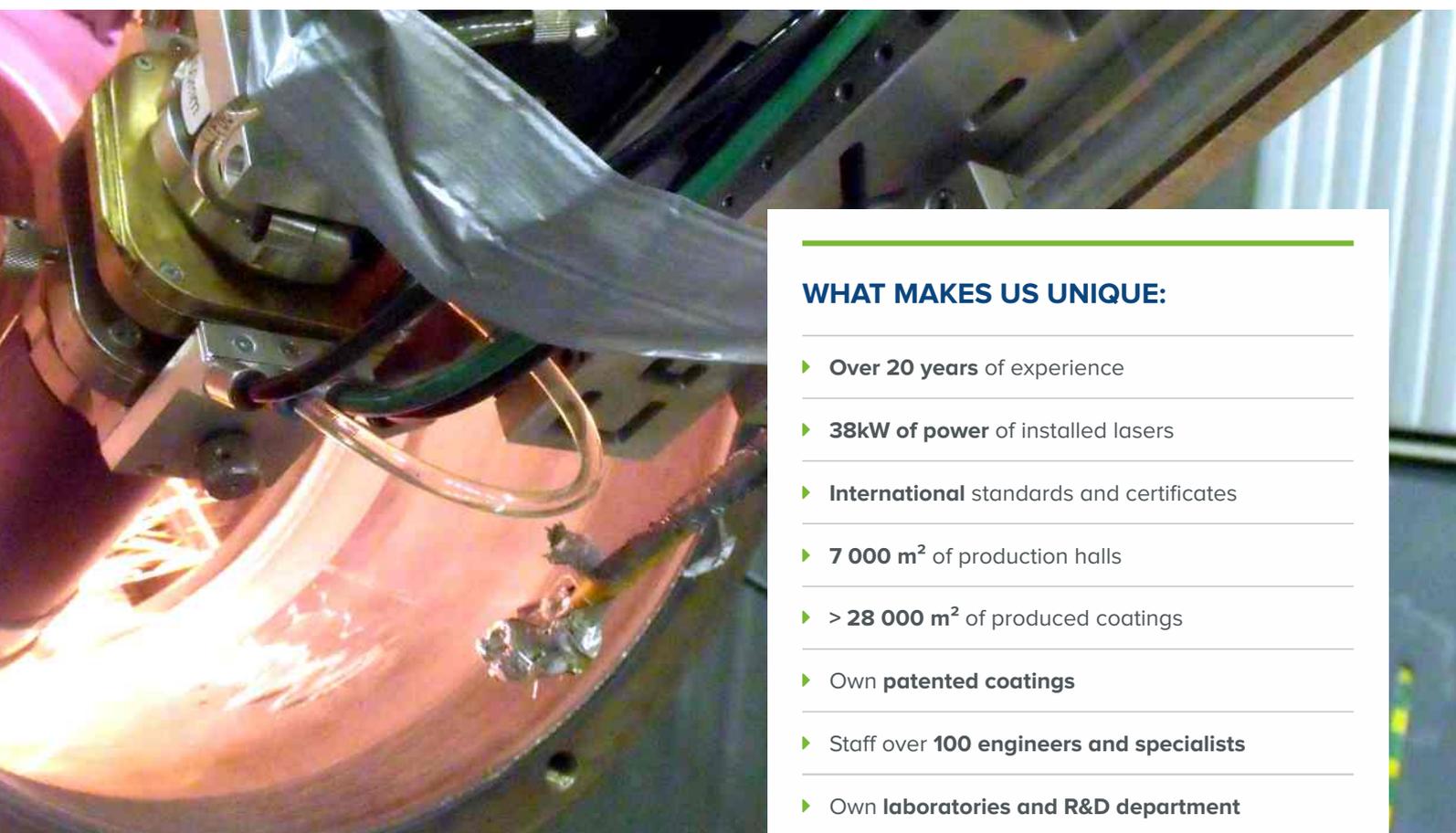
- ▶ Arc
- ▶ Flame
- ▶ Plasma
- ▶ nano HVOF/HVOF



## Laser technologies

- ▶ Laser cladding
- ▶ Hardening
- ▶ Welding
- ▶ Alloying

„ Plasma System possesses the necessary infrastructure, knowledge and experience to effectively implement even the most demanding projects”



### WHAT MAKES US UNIQUE:

- ▶ **Over 20 years** of experience
- ▶ **38kW of power** of installed lasers
- ▶ **International** standards and certificates
- ▶ **7 000 m<sup>2</sup>** of production halls
- ▶ **> 28 000 m<sup>2</sup>** of produced coatings
- ▶ **Own patented coatings**
- ▶ Staff over **100 engineers and specialists**
- ▶ **Own laboratories and R&D department**

### Specialist coating equipment:

- ▶ stationary and mobile devices for laser cladding and thermal spraying,
- ▶ industrial robots and automatic machines for the production of protective coatings on flat and cylindrical surfaces, as well as on elements with complicated shapes,
- ▶ dust-free LTC installations for abrasive blasting of surfaces,
- ▶ mobile cabins and dedusting devices.

### Complete machinery for surface treatment:

- ▶ milling machines, boring machines, centre and carousel lathes,
- ▶ grinding machines for shafts, holes, flat surfaces,
- ▶ SUPERFINISH final surface treatment equipment.

# In line with standards and to environmental protection

We are able to maintain our position as an industry leader thanks to the continuously conducted development research in our laboratories.



Plasma System regularly cooperates with technology universities and internationally recognised research institutes.

Plasma System has allocated over 20 million EUR to research and development since it was established.

Using modern diagnostic tools in state-of-the-art laboratories under the supervision of experts, we are continuously conducting development research and verifying our solutions in the most demanding applications.

Plasma System is today a leader in the field of professional coating for industrial purposes.

#### A GUARANTEE OF HIGH STANDARDS:

- ▶ ISO 9001:2015
- ▶ ISO 14001:2015
- ▶ OHSAS 18001 (currently being implemented)



# d with regard ion



All processes are carried out with regard to protecting the environment and our closest surroundings.

For the sake of the environment and work safety, we conduct all technological processes using high-efficiency filtration and ventilation systems which ensure full compliance with the applicable emission standards.

Production takes place only in specialist sealed process cabins. Pollutant emissions are subject to continuous monitoring, and waste management and water and sewage management are carried out in accordance with the applicable regulations.

Our comprehensive and stringent approach to environmental protection ensures full continuity of production processes and their maintenance at the highest technological level.

Thanks to the use of modern, efficient and ecologically effective technologies, we offer the highest level of services, while respecting the principles of sustainable development of the environment.

#### OUR REFERENCES:

- ▶ GDF Suez
- ▶ PGE GiEK S.A.
- ▶ ZE PAK S.A.
- ▶ EDF Polska S.A.
- ▶ Foster Wheeler
- ▶ TAURON
- ▶ Veolia
- ▶ ENEA
- ▶ ALSTOM Power
- ▶ ARCELOR MITTAL
- ▶ CELSA Huta Ostrowiec
- ▶ FAMUR S.A.
- ▶ ORLEN S.A.
- ▶ Fortum
- ▶ PAK
- ▶ Doosan Babcock

# Proven solutions and measurable benefits

At Plasma System, we combine advanced technologies and unique experience so that our clients can receive tangible benefits.

Each day, over 100 experienced experts from various areas work on the development and effective implementation of our coatings.

The most important value for Plasma System is providing such a combination of advanced technologies and innovations which guarantees that the offered solutions will ensure tangible benefits.

This approach is our commitment to our clients. This is our...

Technology of benefits.



**IMPROVE  
PARAMETERS**

of worn damaged components



**INCREASE THE  
DURABILITY**

of machine parts and devices

**DID YOU KNOW THAT..**

- ▶ Te Combine harvester blades, after the application of Plasma System coatings, can work **up to 7 times longer**, and the cost of their operation can be halved!

**DID YOU KNOW THAT..**

- ▶ By increasing the durability of the drive sprocket roller ring and the inner surface of the bushing you can **extend its service life from 2 to 7 years** and reduce annual costs by more than 80%?

„ Plasma System focuses on providing added value using advanced technologies. This is our technology of benefits.”



### REDUCE COST

of operation maintenance



### REDUCE THE RISK

of emergency downtime and breaks

#### DID YOU KNOW THAT..

- ▶ For Plasma System coating protected coal crushers used in the power engineering industry, **the monthly cost of labour can be lower by as much as 77%**, and service life can be extended by up to 10 times?

#### DID YOU KNOW THAT..

- ▶ Plasma System coatings reduce the risk of downtime for boilers used in power units, **decreasing the number of unplanned downtime days in a year by up to half**. while extending the periods of continuous operation almost twice?

# Solutions tailored to your industry

Plasma System is a leader in the field of coatings protecting energy devices.

Plasma System coatings effectively protect energy devices from adverse phenomena such as:

- ▶ high-temperature and low-oxygen corrosion
- ▶ erosion
- ▶ abrasive wear
- ▶ cavitation

Our solutions have been repeatedly tested and effectively secure:

- ▶ screens of dust boilers against low-oxygen erosion
- ▶ fluidized bed boiler screens and superheaters against erosive wear
- ▶ elements of wires and dust burners
- ▶ blinds, mill fans
- ▶ endless screws of coal feeders, elements of ash removal systems
- ▶ fans, flue gas ducts, cyclones, separators
- ▶ blades and discs rotor of rotary steam turbines
- ▶ turbine shell bearings
- ▶ bolts, shafts, bushings, bearing housings
- ▶ elements of biomass processing systems



„ We have learned how to implement even the most complex projects while effectively reducing risks and maximally simplifying the implementation process”

#### Properties of top layers:

- ▶ hardness of up to 65 HRC, microhardness of approx. 2500 HV
- ▶ high adhesion of the substrate
- ▶ resistance to scuffing, erosion, cavitation, abrasion
- ▶ thermal shock resistance
- ▶ resistance to low- and high-temperature corrosion in a chemically aggressive environment
- ▶ low friction coefficients
- ▶ good electrical conductivity / dielectric properties
- ▶ homogeneous structure, low porosity, complete tightness
- ▶ no impact on the structure and shape of the elements

#### A comprehensive offer for all industry sectors:



▶ **METALLURGY**



▶ **MINING**



▶ **RAIL TRANSPORT**



▶ **THE CHEMICAL INDUSTRY**



▶ **THE MACHINE INDUSTRY**



▶ **THE PAPER INDUSTRY**

Contact our Technical Advisor and find out how we can help you.

# Let's talk about how we can help you

Let us know what challenges you are facing.

For over 20 years, Plasma System has been helping its clients in solving problems related to the operation of mechanical components in demanding working conditions.

## How can we help you?

Contact us or check the materials on our website:  
[www.plasmasystem.pl](http://www.plasmasystem.pl)

You can download our information materials and find more information about the projects we have completed.

Let's get to know each other.



„Tell us about your project and we will help you effectively protect key processes starting from its initial stage”



# Contact

We are looking forward  
to working with you

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