Innovative plasma spray based fabrication Technology of Metallic Coatings for welded joints used in marine applications

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Current Challenges

Existing materials and coatings lack sufficient corrosion resistance and longevity, leading to higher maintenance costs

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Project Summary

Goal

Develop and validate plasma spray coatings using High-Entropy Alloys (HEAs) to improve the longevity of welded joints, particularly in shipbuilding and other demanding industries.

Key Features

- Enhanced corrosion and wear resistance.
- Reduced maintenance costs and improved structural integrity.
- Sustainable and cost-effective coating solutions.

Innovation

- Use of novel HEAs for superior mechanical and corrosion-resistant properties
- Real-time plasma diagnostics for process optimization
- Industry-scale implementation potential

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Type and Role of Partner(s) Sought

Industrial Partners

- Companies specializing in shipbuilding, aerospace, and automotive industries
- Manufacturers of plasma spray equipment

Research Institutions

- Experts in materials science and corrosion-resistant coatings.
- Institutions with expertise in High-Entropy Alloys (HEAs).

End-Users & Testing Facilities

- Facilities for real-world validation in marine and industrial environments.
- Certification and regulatory bodies for new materials.
- Collaboration with European R&D consortia for joint applications

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Topics for Future Horizon Europe Projects

- Advanced plasma spray deposition systems for enhanced corrosion resistance.
- High-entropy alloy (HEA) coatings for improved durability in extreme environments.
- Optimization of plasma parameters for tailored coating properties.
- Large-scale industrial implementation of HEA-based coatings.
- Cross-sector applications: shipbuilding, aerospace, automotive, infrastructure.
- Knowledge transfer and commercialization of plasma spray technologies

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Scientific and Technological Expertise

Expertise in coatings Technologies

•Deposition of thin film, vacuum techniques and optical coatings.
• Scientific and practical knowledge of vacuum techniques used such as: PVD, CVD and HIPIMS ....

Expertise in Plasma Spray Technologies

• Development and optimization of plasma spray systems for HEA coatings
• Experience in Atmospheric Pressure Plasma Spray (APPS)

Material Science & Corrosion Resistance

• Expertise in High-Entropy Alloy in term of preparation, mixing and coatings
• Corrosion and wear resistance testing under extreme conditions

Collaborations & Funded Projects

• Previous involvement in national and EU-funded research initiatives
• Contributions to M-ERA.NET, MySMIS and Horizon-MSCA projects

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