



IGS SMARTGard field-applied reliability intervention is proprietary and unique. It has been successfully implemented to provide scalable, proactively manageable and fully refurbishable boiler tube protection from sliding ash erosion, impact erosion and fireside corrosion.

IGS leverages decades of experience with over 1000 Circulating Fluidized Bed (CFB) Boiler applications. We are at the forefront of maximizing run time and minimizing outage frequency and cost for CFB Boilers globally.

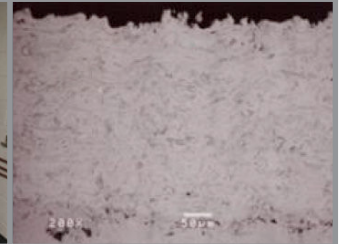
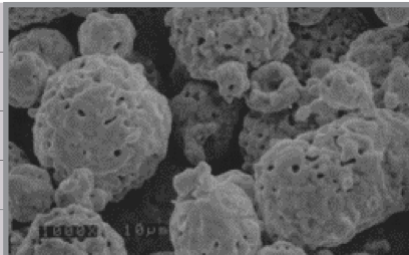
TYPICAL APPLICATIONS:

CFB Boiler Tube Erosion Management

- Sliding ash erosion (kick out, field weld, wing walls, combustor corners)
- Impact erosion (cyclone adjacent and roof)

CHARACTERISTICS*

Thickness	500 - 4000 microns
Porosity	<1%
Total Oxides	<4%
Bond Strength	10000 psi
Microhardness - hard phase	1203 HV _{300g}
High-Temp Erosion Testing in accordance with ASTM G76-13	up to 10x more erosion resistant than carbon steel
Melting Point	2500 F/ 1371 C
CTE	7.1 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$
Density	0.29 lb/in ³



PROPRIETARY SMARTGARD ALLOY

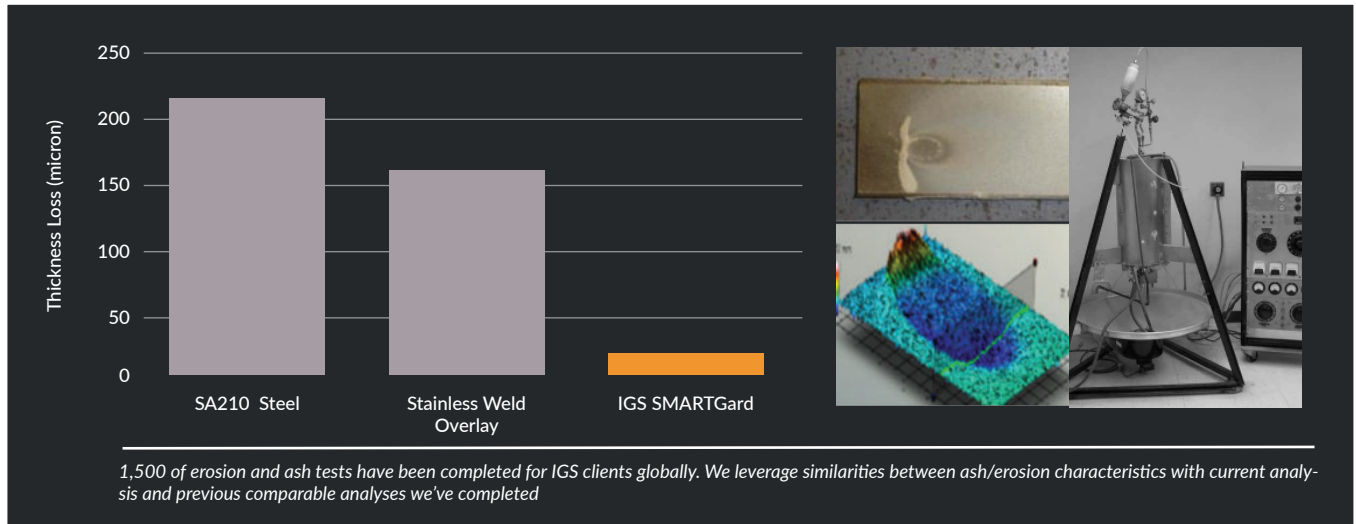
IGS SMARTGard alloy has been specified specifically for HVTS (High Velocity Thermal Spray) supersonic atomization technology. This conveyance technology ensures superior chemical deposit composition of noble metals and additives.

Alloy Feature	Technological Benefit
Nickel base with high Chromium content	Resistant to high temperature erosion, and/or corrosion, the cladding is measurable for ongoing assessment
Boron and Carbon induced hard-phase integration in a ductile binder	up to 10x more erosion resistant than carbon steel (SA210)
Low residual stress and higher bond strength than inter-splat cohesion	Compatible with a wide range of alloys, higher erosion areas addressed with thicker cladding spec

*The technical data contained herein is based on the results of long-term tests carried out in our laboratories and to the best of our knowledge is true and accurate on the date of publication. It is however subject to change due to ongoing testing and material optimization initiatives without prior notice and the user should contact IGS to verify the technical data is correct before specifying or ordering. No guarantee of accuracy is given or implied.



EROSION RESISTANCE (LOWER NUMBER INDICATES GREATER EROSION RESISTANCE)



Process Technology	Qualified Procedure	Technician Certification
<ul style="list-style-type: none"> ✓ Supersonic Atomization ✓ High Splat Homogeneity of Molten Metal Feedstock ✓ Heat Flux Control 	<ul style="list-style-type: none"> ✓ Erosion Zone Analysis ✓ CFB Specific Application and QC Procedures ✓ Reliability Program / Comprehensive Reporting / Inspection 	<ul style="list-style-type: none"> ✓ Annual Re-certification/Continuing Education ✓ CFB Boiler Specialists ✓ HVTS Application Experts

WHAT MAKES SMARTGARD A SMART SOLUTION FOR CFB BOILERS?

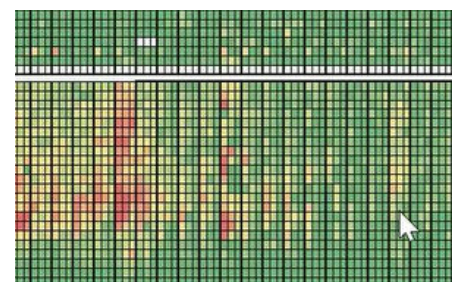
- S** Systematic Approach to Reliable Process Equipment
- M** Materials and Equipment Engineered for Specific Results
- A** Applications by Trained and Certified Teams
- R** Results are Measured, Documented, and Monitored
- T** Testimonials Prove Performance!

IGS SMARTGARD OPERATIONS EXCELLENCE

- Zero Tube Leaks Ever in SMARTGard
- Applications Delivered 98.5% on Schedule and 99.3% on Budget
- CFB-Specialized QA/QC Team
- 350 Full Time Certified Technicians
- 26 Full Time Certified Indonesian Technicians
- 200 Spray Systems
- In-House Metallurgical and Testing Laboratory Established in 1995

QUALITY MANAGEMENT SYSTEM

IGS SMARTGard application includes critical steps to ensure lasting performance. A five-layer internal audit system, mapping, before and after SEE (cladding thickness) report, verification of surface preparation prior to cladding, management of tube mechanical weld/grind work, documentation and memorialization of step by step QC/QA for every UOP in the boiler.



SEE report example with UOPs mapped out

IGS SMARTGard Solution includes all components critical for effective and efficient protection of CFB boilers.

Contact us to learn more: info@integratedglobal.com

