

Industry: Power Generation – Wet Flue Gas Desulphurization (FGD)

Location: India

Application Area: Chimney Stack

Project Duration: 15 Days

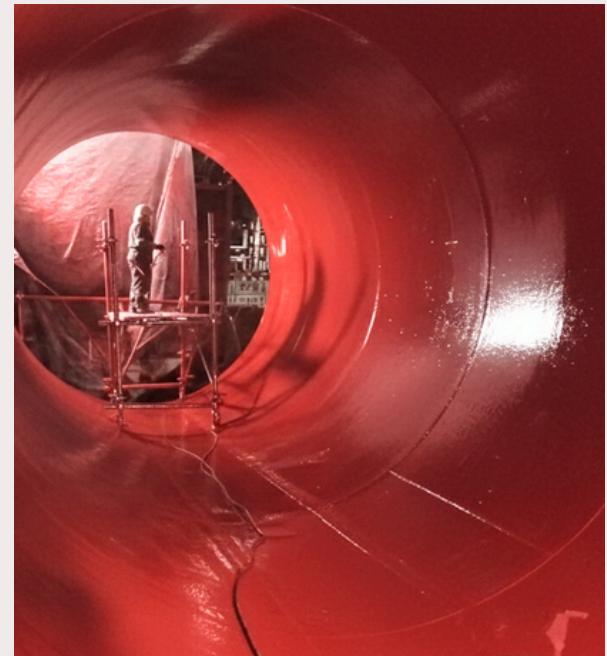
Product: Duromar® HPL-4323, HPL-2132

## Project Overview

A power generation chimney operating under wet FGD conditions was exposed to continuous acidic condensates, sulphur compounds, moisture saturation, and temperature cycling. These highly aggressive service conditions represent one of the most demanding corrosion environments for internal carbon steel chimney structures.

Prolonged exposure within the stack shell leads to rapid corrosion, coating failure, under-film attack, erosion from particulate carryover, and premature structural degradation, resulting in high maintenance demand and potential risks to operational reliability.

Arudra Engineers Pvt. Ltd. was engaged to implement a complete corrosion protection solution through the application of a high-build Duromar® Glass-Flake Lining System, designed to ensure long-term durability and dependable corrosion resistance throughout the chimney interior.



## Problem

- Chimney internal steel surfaces were continuously exposed to **acidic condensates and corrosive sulphur vapours**.
- High humidity and thermal cycling created conditions conducive to blistering, cracking, and coating disbondment.**
- Large vertical surface areas required a seamless, thick-build lining system capable of providing continuous barrier protection against **moisture ingress and chemical attack**.
- Complex weld seams, transitions and connection joints were susceptible to **localized corrosion and coating discontinuities**.
- The client required a **long-term, high-performance corrosion protection system** that could be safely applied under confined, vertical working conditions.



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# CORROSION PROTECTION OF POWER PLANT CHIMNEY USING DUROMAR® GLASS FLAKE PROTECTIVE LININGS



## Solution

Arudra Engineers recommended a 100% solids glass-flake protective lining system using Duromar® high-performance coatings engineered specifically for aggressive chemical environments encountered inside power plant chimneys.

### Surface Preparation

- Steel substrates were abrasive blasted to **SA 2.5 (SSPC-SP10)** using approved abrasive media.
- **An anchor profile of 75-100 microns** thickness was achieved to promote mechanical bonding.
- **Blasted surfaces were vacuum-cleaned to remove residual dust and contaminants.**
- Climatic conditions (ambient temperature, relative humidity, and dew point) were continuously monitored prior to coating.
- **Objective → To achieve a clean, reactive surface capable of delivering maximum lining adhesion and long-term corrosion protection.**



BEFORE



AFTER



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**DUROMAR®**

## Coating Application

### 1. Detail & Seam Coating:

All weld seams, edges, joints, corners, and complex geometries were manually coated using **Duromar® HPL-2132** at an average thickness of approximately **500 microns to seal corrosion-prone areas and ensure uniform lining continuity prior to main spray application.**

### 2. Main Lining Application

**Duromar® HPL-4323** was applied to the chimney interior using controlled spray application techniques in three successive coats, each achieving approximately 1,000 microns thickness.

#### Total lining thickness achieved:

**≈ 3,000 microns (3.0 mm)**

This multi-coat application method ensured the creation of a dense, seamless, high-build glass-flake lining capable of withstanding continuous acidic condensate exposure and aggressive operating conditions within the chimney environment.

### 4. Curing:

- **Curing was carried out under natural atmospheric conditions.**
- No operational exposure was permitted until full polymerization of the lining system was achieved in accordance with product TDS recommendations.
- **A minimum of 72 hours was allowed for complete curing and full development** of the lining system's mechanical and chemical resistance properties prior to commissioning.



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## Inspection & Quality Assurance

A comprehensive inspection and testing protocol ensured conformance to project quality standards at every stage:

- **Surface Profile Verification** after abrasive blasting.
- **Wet Film Thickness Monitoring** during coating application.
- **Cure Validation** at Every Stage prior to overcoating.
- **Dry Film Thickness** Measurement in accordance with SSPC-PA-2 standards.
- **Holiday Detection Testing** performed as per ASTM D5162 using calibrated high-voltage detectors across 100% of the coated area.
- **Visual Appearance Inspection** prior to final acceptance.
- **Joint Final Inspection** conducted following full system cure before commissioning.



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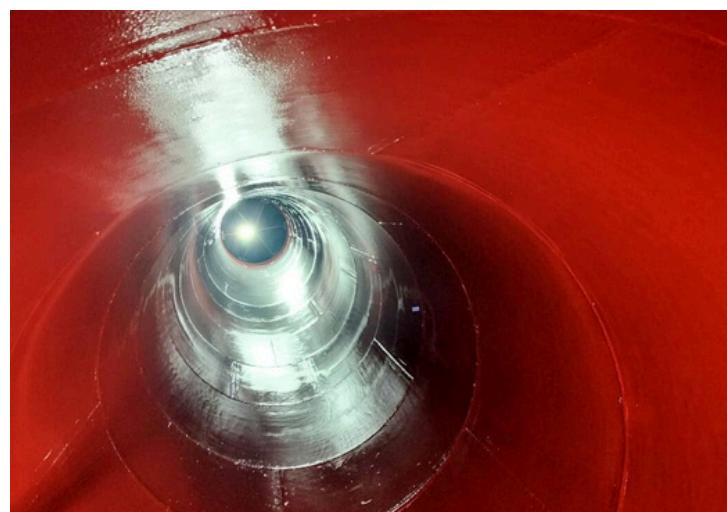


## Outcome

The application of **Duromar® Glass-Flake Lining Systems (HPL-4323 + HPL-2132)** successfully provided long-term corrosion protection to the internal chimney surfaces operating under aggressive acidic condensate and moisture exposure conditions. The solution ensured the formation of a seamless, high-build protective barrier, enhanced coating integrity, and delivered extended durability for continuous stack service environments.

## Key Highlights:

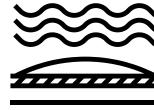
- **Successful corrosion protection of chimney interiors using a complete high-build glass-flake lining system.**
- **Achieved durable barrier protection without structural replacement**, enabling rapid turnaround and cost efficiency for the client.
- **Utilized 100% solids, Zero-VOC Duromar® technology**, ensuring safe confined-space application and long-term performance under acidic operating conditions.
- **Delivered superior chemical and moisture resistance**, preventing condensate attack, blistering, and coating under-film corrosion.
- **Layer-wise QA/QC and controlled curing ensured consistent film build, excellent adhesion, and reliable long-term protection in aggressive power plant chimney environments.**



### KEY FEATURES



Superior acid  
chemical resistance



High abrasion and  
erosion resistance



Outstanding adhesion  
to blasted carbon steel



Zero VOC 100% solid  
technology



Extended Service Life and  
Reduced Maintenance



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