

Major Power Plant in Turkey Protects Stack and Facility Equipment with ChemLine® Coatings

ChemLINE®
CASE STUDY

One of the largest thermal coal-fired power plants in Turkey had a serious coatings corrosion problem on the inside of their 180-meter carbon steel stack, at the height of 170 meters. They had previously lined this area with a vinyl ester coating, however it did not even last 10 months before serious de-lamination problems occurred (as shown in photos below).

At the time, a ChemLine® coating project was in progress at the power plant, being handled by Advanced Polymer Coatings (APC) operation, MarineLine Turkiye. Plant personnel noticed APC's professional approach and the excellent coatings result.

When plant personnel discovered coating de-lamination problems inside the stack (shown by red arrow in photo), they asked if ChemLine® could also handle these severe conditions, where a mixture of different chemicals — 70.295% Nitrogen, 12.858% Water, .005% Sulfate, 11.769% Carbon Dioxide, and 5.07% Oxygen — operate in temperatures of 140°F/60°C and at times reaching 233°F/112°C.

After reviewing the extensive project reference list from MarineLine Turkiye for similar projects, including coatings work done for EREN ENERGY and others, the power plant contracted for ChemLine® lining within the stack.



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The Application Process

Base Coat of ChemLine® - Red



The first step was that plant personnel set up portable staging within the stack to a height of 170 meters. APC's team then washed the inside of the carbon steel stack surface with high pressure water jetting. Next APC removed the existing remaining vinyl ester lining by blasting with copper slag grit to a Sa2.5 standard, and minimum 75-micron surface profile. This was followed by a second surface blast, again to a Sa2.5 standard. After blasting, APC marked needed welding and grinding areas, and this work was carried out by power plant personnel to finish the surface preparation.



APC now sprayed the base red ChemLine® 784/32 coating (as shown in photos above). This was followed by a mostly roller stripe coat (above), especially covering the corroded steel surfaces. The ChemLine® 784/32 grey topcoat was then applied by spray (as shown top right).

Top Coat of ChemLine® - Grey



Testing of the ChemLine® coating was done by high voltage spark test (as shown below) and by dry film thickness measurements, and touch-ups were conducted by APC as needed. The entire coating project covered an area of 20 meters high by 5.5 meters in diameter.

The final phase of the project, heat curing, started with the installation of two fans and burners at the bottom of the stack. Thermocouples were placed near the top of the 180-meter stack to provide continual temperature measurement. The stack was covered with a hard canvas to retain heat during curing. The heat curing process took 10 hours, with temperatures at the top of the stack managing to reach up to 90°C/194°F.



Additional Coating Projects



The customer requested ChemLine® coating also be applied in a number of other high performance areas at the power plant.

- 500 square meters of stack tunnels (above).
- 35 meter length x 1.80 meter diameter condenser lines/sea water lines (above).
- Concrete neutralization pits.
- Two process water tanks; one for 37% HCL, and the other for 45% sodium hydroxide (shown right).
- Some outer areas of the stack.

The power plant stopped production for 26 days while blasting, coating and heat curing work was done.



90 Day Followup



After 90 days of operation, the power plant stopped production to check the condition of the ChemLine® coating. The inspection showed the coating in near-perfect condition (as shown in this 90-day inspection photo of a close-up of the stack tunnel presented in the photo area above). The customer is pleased with the result and will conduct a through review after one year of service, with plans for future ChemLine® protective coating projects.

1-Year Followup

After one year of service, production was stopped at the plant and ChemLine®-coated areas were once again inspected. There were no coating defects found

and the plant resumed service. These photos illustrate the coating condition after one year of service.



CONDENSER LINE AFTER 1 YEAR CHEMLINE® SERVICE



FGD UNIT AFTER 1 YEAR CHEMLINE® SERVICE



FGD UNIT AFTER 1 YEAR CHEMLINE® SERVICE



FGD UNIT AFTER 1 YEAR CHEMLINE® SERVICE

1-Year Followup – Stack

The ChemLine[®] coating in the stack was also inspected after 1 year of service, with no problems found. The rust shown at the top of the stack is rust stain

from the manifolds, and not any corrosion effect.



STACK AFTER 1 YEAR CHEMLINE[®] SERVICE



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