

Heavy-duty corrosion protection in chemical industry – Fluorothermoplastic linings

Dr Mirko Lotz, Quadrant EPP AG, Lenzburg, Switzerland; presenting author

Industrial chemical processes involve strong acids, strong bases and aggressive organic media. In addition, often high temperatures add, driven by the call for higher output and higher product concentrations. The resulting chemical processes are of chemically most aggressive nature, and require adequate materials of construction in order to withstand the corrosive conditions. Where common steel grades and standard plastics do not stand the chemicals and temperatures, coatings do not provide sufficient wall thicknesses, and expensive high nickel steels or exotic materials like titanium are not feasible from a price and availability perspective, or even would corrode as well, linings from fluorothermoplastics like PVDF, ECTFE, FEP and PFA can be an excellent choice of material.

As proven in numerous successful applications, the fluorothermoplastic liners can be installed in tanks, vessels, scrubbers, reactors and pipelines, with outer structures made from FRP (fibre reinforced plastic) or steel, or, in special constructions like concrete or plastic with fluorothermoplastic lining. Also heat exchangers working in the presence of condensing acids can be equipped with fluorothermoplastic liners as protection against the otherwise extremely aggressive dewpoint corrosion.

However, the optimum choice of the liner system and of the installation method is pivotal for the performance of the lined equipment. Therefore, the fluorothermoplastic polymers, possible lining technologies as well as the required lining materials will be introduced. Advantages and limitations will be discussed as well as aspects of manufacturing. Application examples will be shown for illustration of the versatility of fluorothermoplastic linings for heavy-duty corrosion protection in chemical process plants.