



Mersen's key role in high-performance materials: 1 - reactive metals

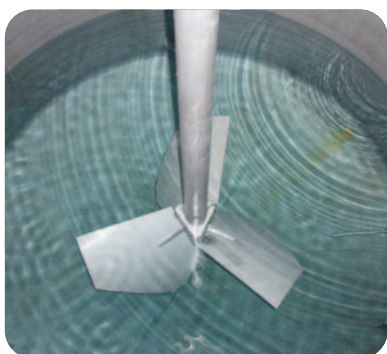
As an expert in materials ever since it first started out in the manufacture of synthetic graphite, Mersen has consistently served a wide variety of applications throughout its long history and extended its expertise to materials geared to highly demanding environments, such as high temperatures and extremely corrosive environments.

In this edition of Focus, we put the spotlight on “reactive metals”¹—a group of materials delivering sparkling performance that has fuelled Mersen’s expansion

Reactive metals used to meet the needs of chemicals and pharmaceuticals markets



Heat exchangers



Stirrer

Mersen’s Advanced Materials and Technologies segment first started to capitalize on the anti-corrosive and heat-conducting properties of graphite in the 1950s. Ever since, it has marketed graphite-based equipment to the chemicals and pharmaceuticals industries, which require materials that can withstand highly corrosive conditions, high pressure and high temperatures.

To enrich its product range and meet the demand created by an ever growing number of applications, Mersen has gradually extended its expertise to reactive metals such as titanium, zirconium and tantalum (in increasing order of cost and corrosion resistance), which it does not produce—unlike graphite—but incorporates in the manufacture of its equipment in various forms.

These rare and expensive metals are well known for their corrosion resistance (highly acidic, alkaline or very hot environments) and for their ductility—in other words, their ability to deform without breaking, which enables them to resist high pressure or be used as a lining for pipes and chemical reactors. Since they are good thermal conductors, they can also be used in heat exchangers.

Thanks to its well-known expertise in thermal design, engineering and manufacturing processes, Mersen designs and manufactures equipment (columns, pressure vessels, reactors, heat exchangers, stirrers and mixers) using reactive metals suited to meeting the extreme conditions associated with industrial chemicals and pharmaceuticals processes.

¹ Reactive metals are sometimes described as noble metals

Mersen selected to supply noble metals critical equipment for the chemical industry



Mersen has been awarded a contract by SABIC, one of the world's largest petrochemical companies, to supply critical equipment in noble metals for the manufacturing of high-performance plastics.

The production process of such plastics includes steps in which highly corrosive media have to be processed in a safe and environmentally-friendly way.

Mersen was selected for the quality of its high-tech equipment made of high-end materials, for its ability to meet customer demands with a tailored offer and its ability to complete projects of significant size.

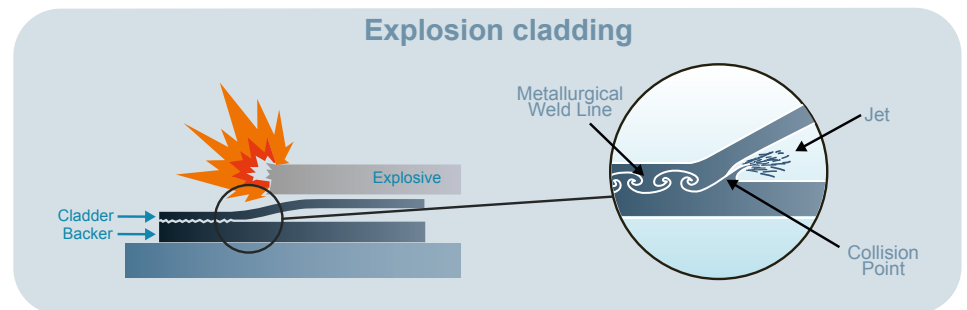
Manufacturing processes based on reactive metals

Reactive metals can be used in various forms, including in massive form or as coatings.

Given their cost, a thin layer is often applied to a less noble base material (carbon steel, stainless steel, etc.) to produce a permanent composite while still guaranteeing a flawless seal.

Two main processes are used depending on the nature of the metals to be combined, the mechanical resilience required and the temperature that needs to be reached to produce the composite: the explosion plating or **explosion cladding process** and **brazing**.

> **Explosion cladding** consists in projecting a cladder onto a backer using the energy produced by detonating an explosive. It resembles a form of cold welding and does not generate any notable increase in temperature.



> **Brazing** is used to assemble metals through capillary action. In this process, a filler material with a melting point below that of the other base metals is added to them. They are then heated to enable the filler metal to melt and spread between the metals to be assembled in order to form a perfect joint. In addition, Mersen has developed and patented CL Clad®, its own brazing technology.

