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## Optimized ThyssenKrupp VDM material offers exceptional corrosion performance to resist highly aggressive acids

The research laboratories of ThyssenKrupp VDM have succeeded in further developing the tried and tested material Alloy 31 and improving its properties once again.



The new Nicrofer 3426 hMo occupies a position between high-alloy nickel materials and stainless steels and is a superaustenitic. A superaustenitic is an austenitic thus nickel-containing material with additional high alloying elements chromium and molybdenum giving it improved corrosion resistance. The development of the material was supported by modern computer simulation programs to optimize the composition of the entire alloy system. Initial commercial heats have been produced, confirming the market-readiness of the new high-performance material.

Corrosive media such as seawater, acids, alkalis and saline solutions create an aggressive environment that requires tough materials. The new alloy not only offers exceptional corrosion resistance but also outstanding processing capabilities and properties. The high chromium content of 26 to 28 percent guarantees stability in oxidizing media, i.e. it prevents the metal from combining with oxygen. Despite this, the material has a stable austenitic microstructure and the alloying elements nickel and nitrogen make processing easier as a result of low solution annealing temperatures. In addition, a low carbon content decisively improves resistance to intergranular corrosion, in which elements are removed from the metal matrix adjacent to grain boundaries.

All this makes Nicrofer 3426 hMo the ideal solution for difficult applications. It is an important component of equipment for the chemical process industry, and in particular for the production and processing of sulfuric and phosphoric acid. Phosphoric acid has many uses. For example it is used as a feedstock in the manufacture of phosphate fertilizers and detergents. Phosphoric acid in controlled amounts is also approved for use as an acid regulator for some food and drinks. But one of its most important uses is as a feedstock in the manufacture of phosphate fertilizers, the basis of today's agricultural production.