



## Refinery Applications



### Air Grid Nozzles

The excellent wear-resistant properties of Technox® 2000 ideally lends itself to the highly erosive environments of the air grid within the Fluid Catalytic Cracking Unit (FCCU).

Traditionally, there have been problems with the joint used to locate the ceramic in the steelwork of the air grid – and because the two materials have different coefficients of thermal expansion, the ceramics tend to come loose at elevated temperatures. Dynamic-Ceramic has patented a fixing method that holds the Technox® piece firmly at all temperatures within a split metal collar, which is spot-welded around the nozzle to ensure a snug fit.

The whole assembly can then be mounted by welding the collar to the grid, and the novel design ensures that both ceramic and steel remain in intimate contact throughout the operational temperature range. This design has been successfully used in several refineries and the Technox® 2000 nozzles are now entering their third cycle of operation, having being found to be in excellent condition after ten years' service. The extended life of the nozzles reduces subsequent turnaround costs and, more importantly, provides a more consistent fluidized bed for easier management.

### Catalyst Withdrawal Tubes

These parts have lasted 10 times longer than a refractory liner in the same application and Technox® 2000 was chosen for its excellent

wear resistance to high flow rates of catalyst material. In ASTM C-704 tests, Technox® 2000 components recorded a 0.25cm<sup>3</sup> loss compared with a refractory figure of around 3.00cm<sup>3</sup>. The end result of the introduction of this part is a more controllable flow of catalyst through the discharge port and less damage to the local pipe and valve areas. Other components within the FCCU, such as orifice plates and feed injectors made from Technox® 2000, have also had their performance and lifetimes increased. This is due to the high strength, high fracture toughness and wear resistance of Technox® 2000.

### Pumps and Valves

As well as providing excellent erosion resistance within the FCCU, Technox® zirconia ceramics are also widely utilised within pump and valve applications around the refinery. Tests have proved Technox® 3000 to be up to 18 times more wear resistant than tungsten carbide materials. As Technox® ceramics are oxides with no vulnerable binder phase, they are virtually inert and therefore resistant to corrosion as well as attack by cavitation, which erodes the binder in tungsten carbide based materials. Please see our Pump and Valve data sheet for further details.

### Customer Support

Dynamic-Ceramic manufactures custom-made parts to our customers' specifications. For more details of our products and services or to discuss your specific requirements, please contact one of our Sales Engineers.

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