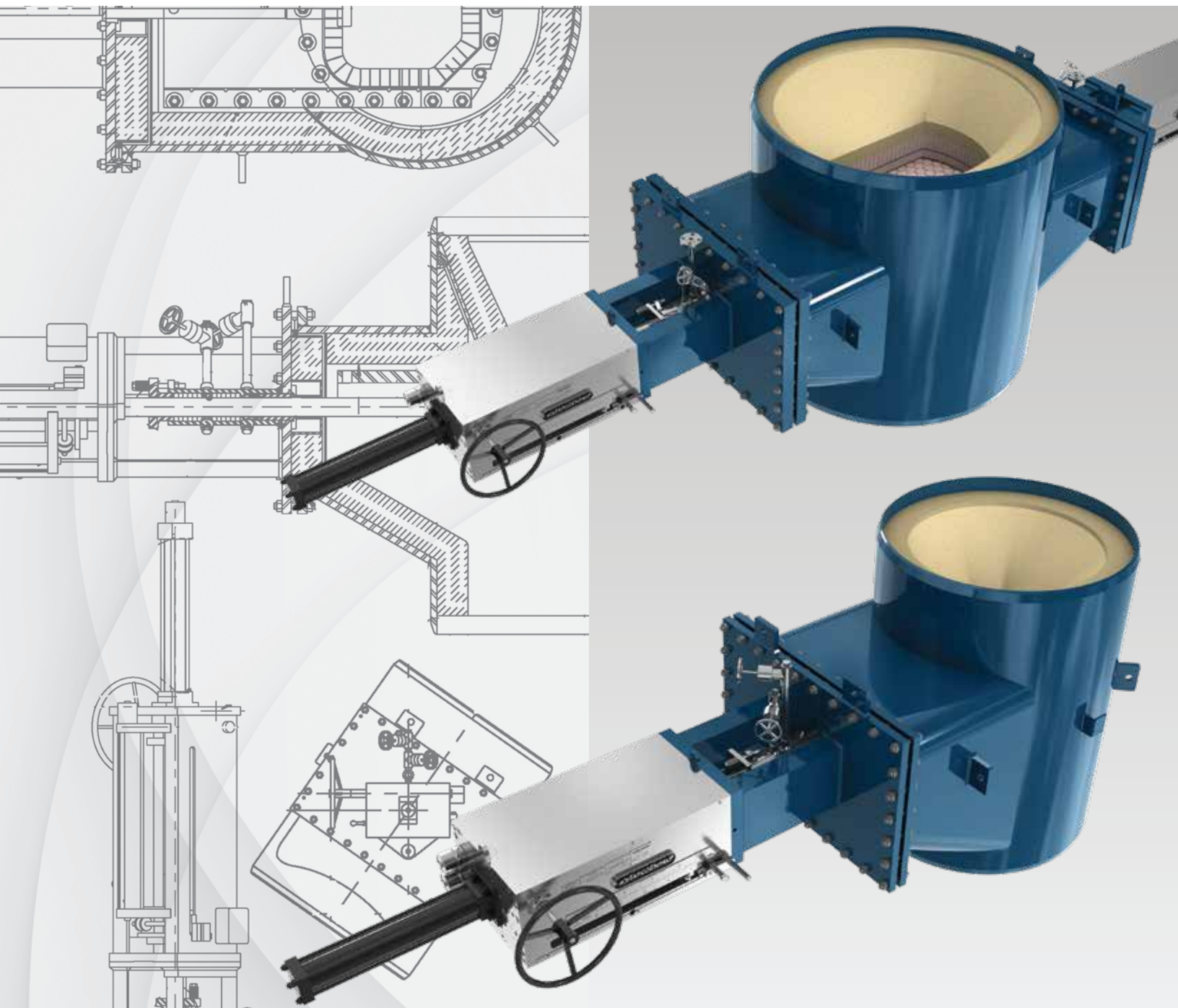
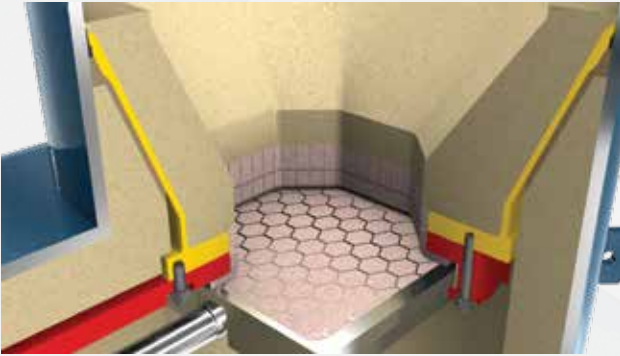


# FLUID CATALYTIC CRACKING SLIDE VALVES



TapcoEnpro

## BOLTED SLIDE VALVES



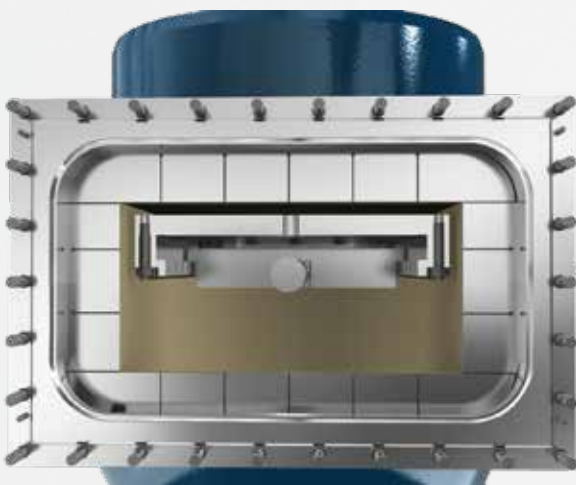
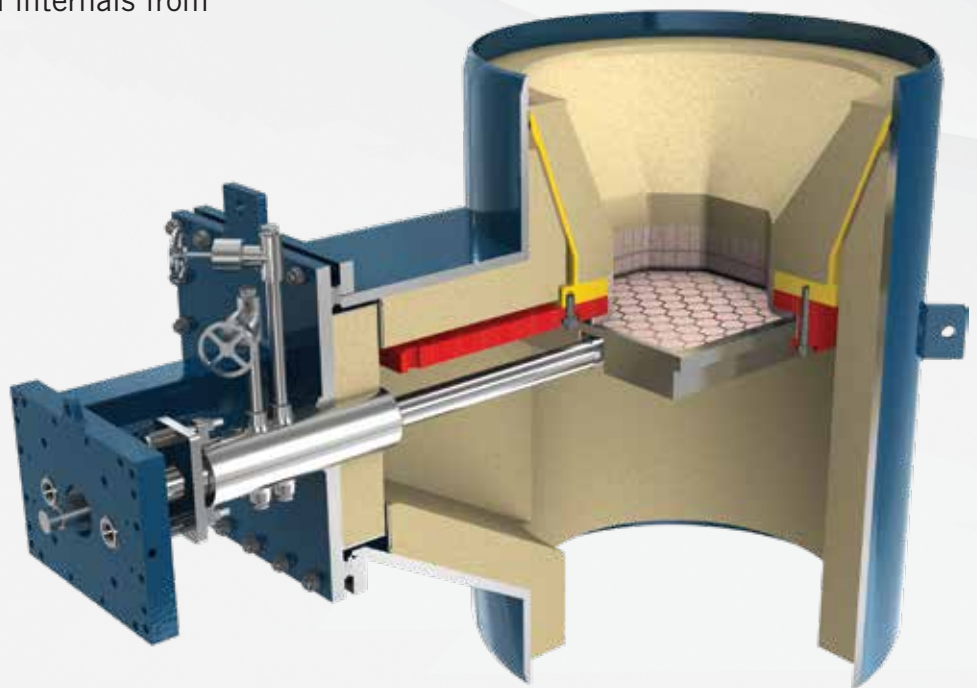
Each of our valves are custom designed to your operating conditions including applicable codes, FCC licensor specifications, customer supplied requirements, and our own in-house standards for maximum temperature and abrasion resistance.

Valves are designed for the licensor's requirements and can be supplied either as Cold Shell (body material is carbon steel) or Hot Shell (body material is either chrome or stainless) designs.

Our slide valve design includes special refractory linings to protect the valve body and internals from high temperatures and erosion.

The disc and orifice plate are refractory lined specifically to protect against erosion. Our cold shell valve suspended internal cone is welded to the body shell with the bimetallic weld located in the straight section of the cone itself and the hot shell design is welded with materials consistent with the body shell.

Our guide construction prevents catalyst build-up and provides for easy maintenance. Finished ground hard facing is provided to ensure long-term, reliable service.

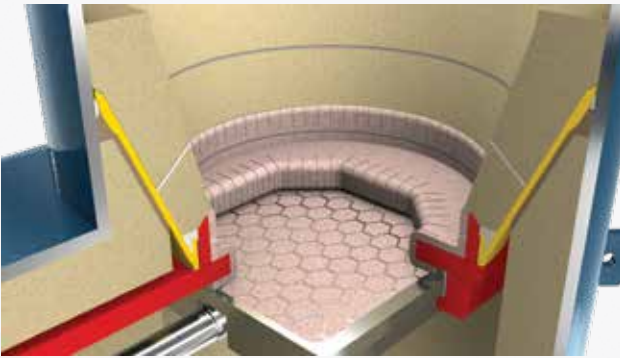


The shaft's one-piece forged through shaft design resists complex changes in flow conditions and disc position. Potential wear areas of the shaft are spray coated with a cobalt based hard facing material for erosion protection.

The disc is designed to resist deflection under full load to be less than .005 inches. Full face refractory construction with ground hard face runner surfaces resists erosion and prolongs service life. The disc design protects stem knuckle from flowing media.



## BOLT-LESS SLIDE VALVES

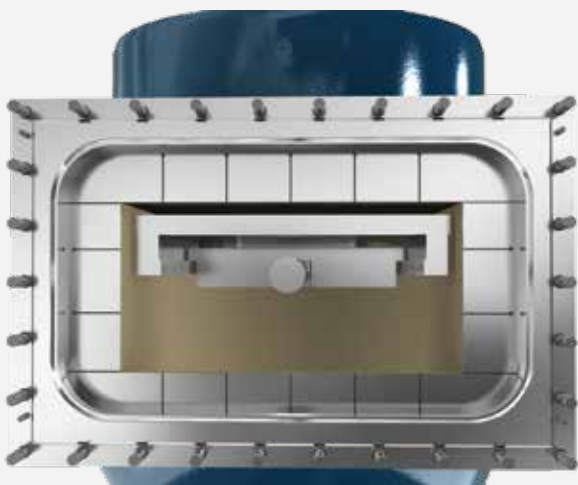
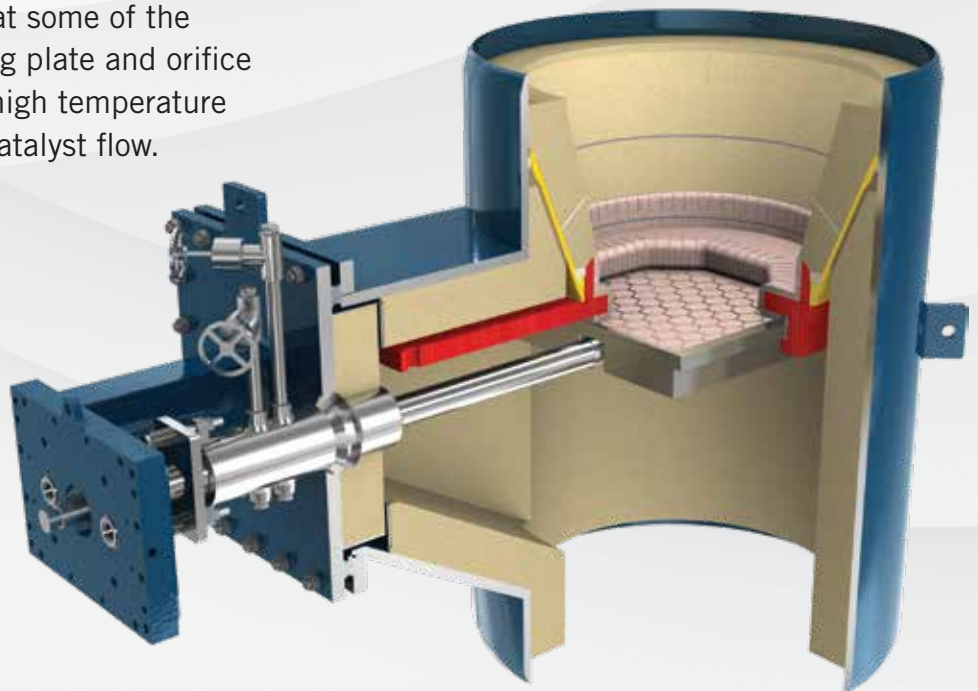


Slide valve internals are easily removable through the valve bonnet for easy maintenance. We designed their internal components to withstand high temperatures, pressure drops, and erosive properties of the flowing catalyst.

Internal components center catalyst flow through the valve to minimize erosion of internal valve body surfaces.

Operating experience has proved that some of the bolts connecting htge guides, sealing plate and orifice plate will break due to exposure to high temperature as well as to erosion rom adjacent catalyst flow.

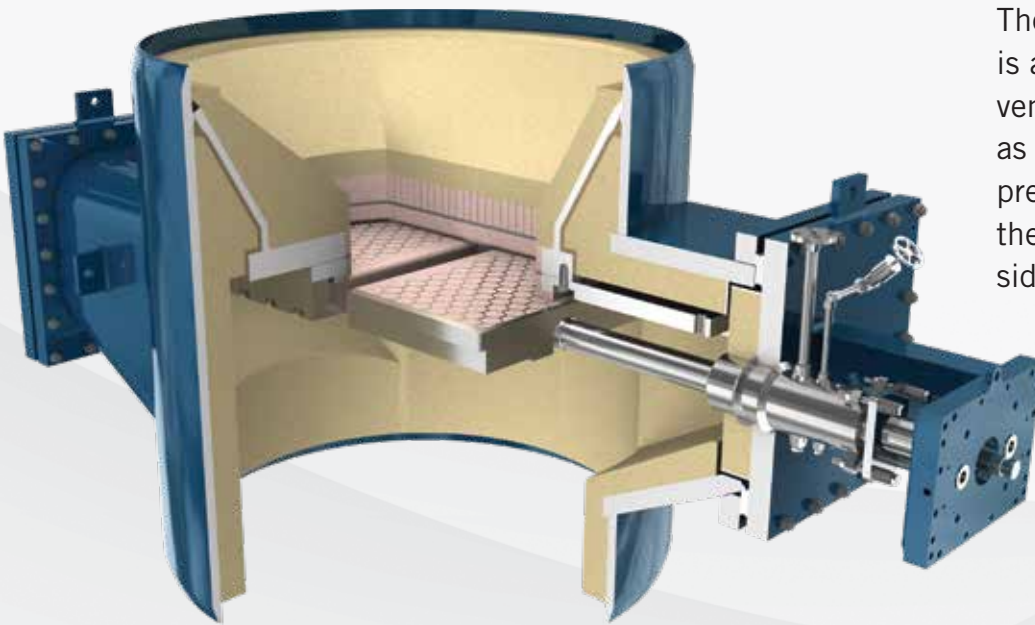
In the bolt-less valve design, the orifice plate, disc, and guide assembly carries the entire internal loading of the valve, which in-turn eliminates internal bolt loading and bolt tension. This innovative valve design eliminates the need for a conventional seating plate, and provides approximately 15 times the effective stress area of conventional bolting.



Designed to eliminate downtime due to bolt failure in FCC slide valves, the TapcoEnpro bolt-less slide valve can also significantly reduce maintenance service time.

The unitized internals have no bolts to disassemble, and the machined surfaces which partner together require no gasket seating. Loads are transferred to the internal support cone and produces a lower stress across the assembly rather than high stress in the conventional orifice to seating plate bolting. The result is more reliability and less downtime.

## FLUE GAS CONTROL



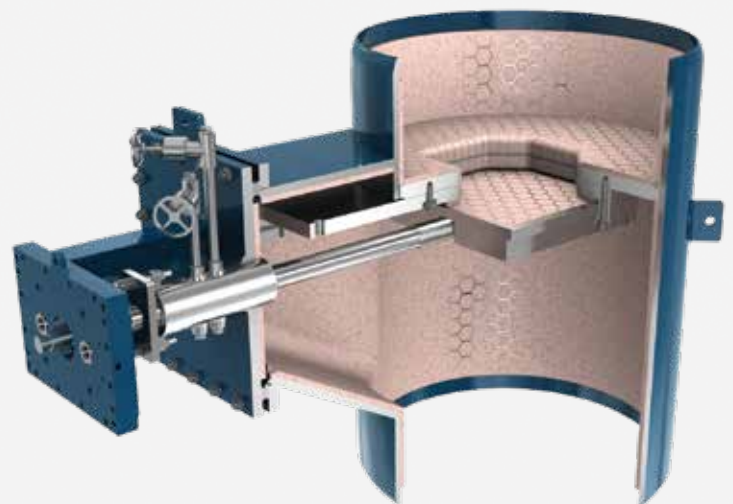
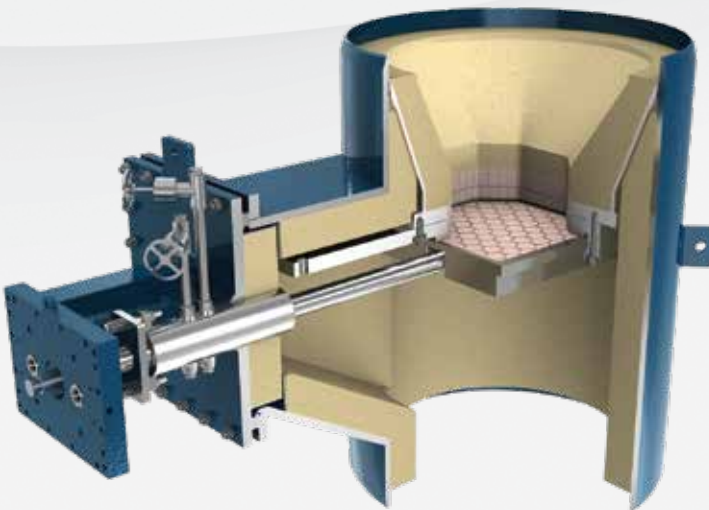
The Double Disc Flue Gas Valve is a pressure control valve, venting the regenerator vessel as necessary to maintain the pressure differentials between the regenerator side and reactor side of the FCC Unit.

## HOT & COLD SHELL DESIGNS

Hot Wall valves require the valve inlet, bonnet and exit areas to be completely covered with an erosion resistant refractory lining in a hexmesh type anchor system while Cold Wall valves are designed to have the valve inlet, bonnet and exit areas be completely covered with a single layer cast vibrated insulating refractory lining over a V-anchor system.

Materials of construction are determined according to operating conditions:

- Up to 700°F (370°C), carbon steel and hard facing and/or refractory
- From 700°F (370°C) to 1200°F (650°C), chrome alloy with hard facing and/or refractory
- Above 1200°F (650°C), stainless alloy and special materials required





# CRITICAL FLOW SOLUTIONS™



Catalyst Plug Valve



Expander Control



Flue Gas Diversion



Flue Gas Isolation



FCC Reactor Isolation



Controls / Actuation

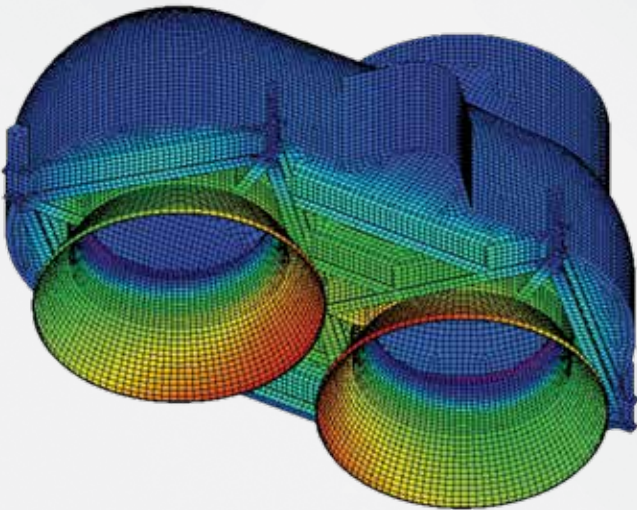


Expander Isolation

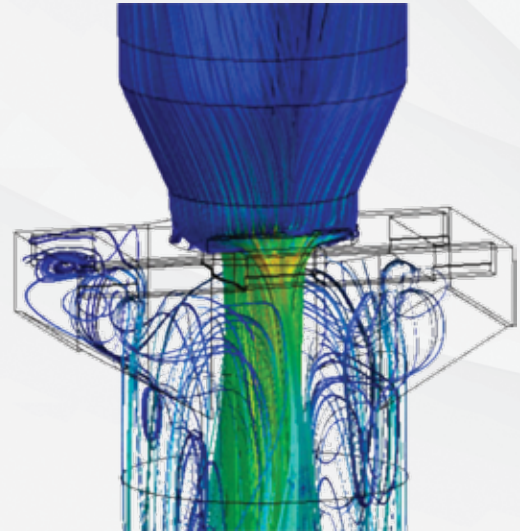


Catalyst Withdrawal

## ENGINEERING & QUALITY



TapcoEnpro is a leader and innovator of new slide valve technology, and has developed many of the “firsts” for the FCC Industry. Many of these innovations are now standard in technology company and refinery specifications worldwide.



For over 20 years our engineering teams have used three dimensional (3D) modeling programs to guarantee all valves meet or exceed industry standards and customer specifications. Additionally, we have developed our internal proprietary programs to incorporate the latest codes and standards.



Our engineering group performs many different types of analysis of the valves which include:

- Finite Element Analysis
- Thermal Analysis
- Structural Analysis
- Computational Fluid Dynamics
- Buckling Analysis
- Thermal Stress Analysis



Our slide valve testing includes:

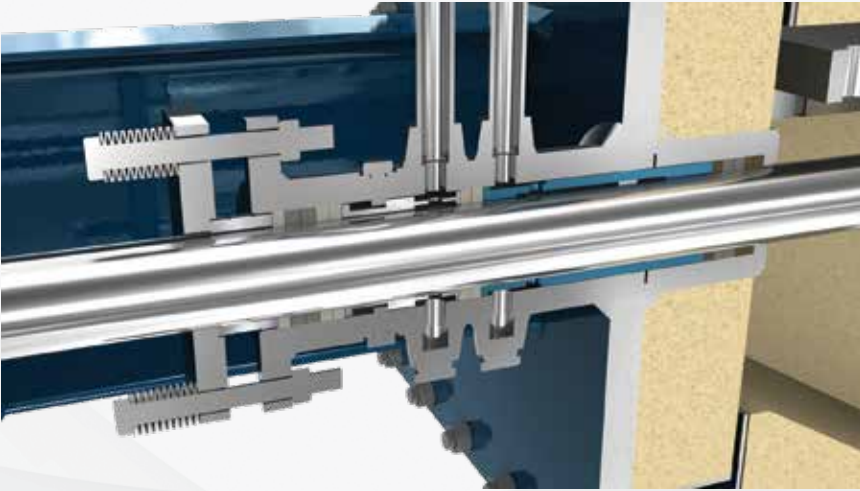
- NDE testing
- Dye Penetrant Test
- Ultrasonic Test
- Magnetic Particle Test
- Radiography – X-Ray
- Hydrostatic Testing
- Cold Stroke Test
- Hot Stroke Test

Working closely with our manufacturing, inspection, testing, and quality assurance departments, our engineers work to ensure all valves are engineered, fabricated, inspected, and tested to the customer requirements and the latest industry standards.

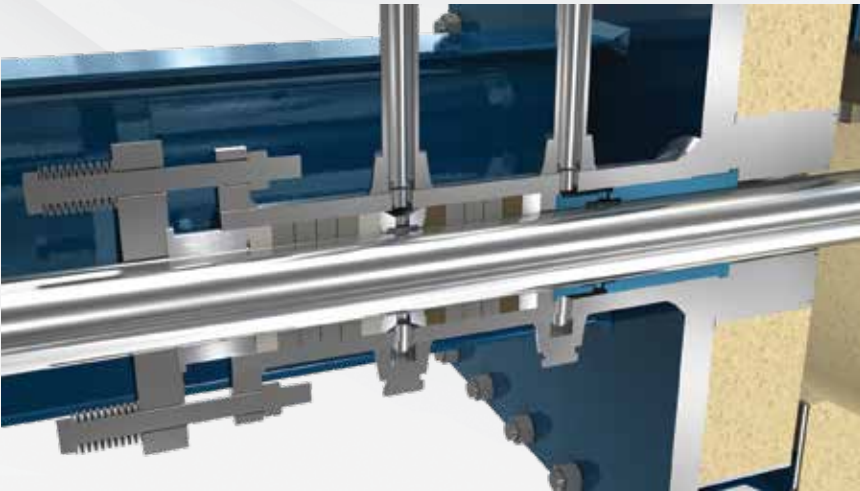


## PURGE SYSTEMS

Static Purge Design



Dynamic Purge Design



TapcoEnpro's state-of-the-art Static Purge packing chamber eliminates the consumption of nitrogen or steam and high repair costs caused by sticking, eroding, or cracking valve stems, and excessive or inadequate purge.

Unlike standard or dual packing chambers commonly found on valves for high-temperature catalyst service, this patented Static Purge stuffing box does not rely on a bearing sleeve, bleeding ring, or constant purge as the primary sources of stem operation.

Connected to a continuous supply of nitrogen or instrument air, the purge medium acts as a back-up to three sets of packing. Because the stored purge is consumed only if the packing wears out, a significant reduction in nitrogen costs can be realized.

## TRUSTED PARTNER

As a trusted partner, we deliver safe, reliable products while providing the best value for our customers. From the moment a customer contacts us, through delivery, installation, support and service we're there to provide unparalleled products, service and support. We continually strive to make our products the best, most reliable in the industry.



Channelview, Texas



Barnsley, UK



Calgary, Canada

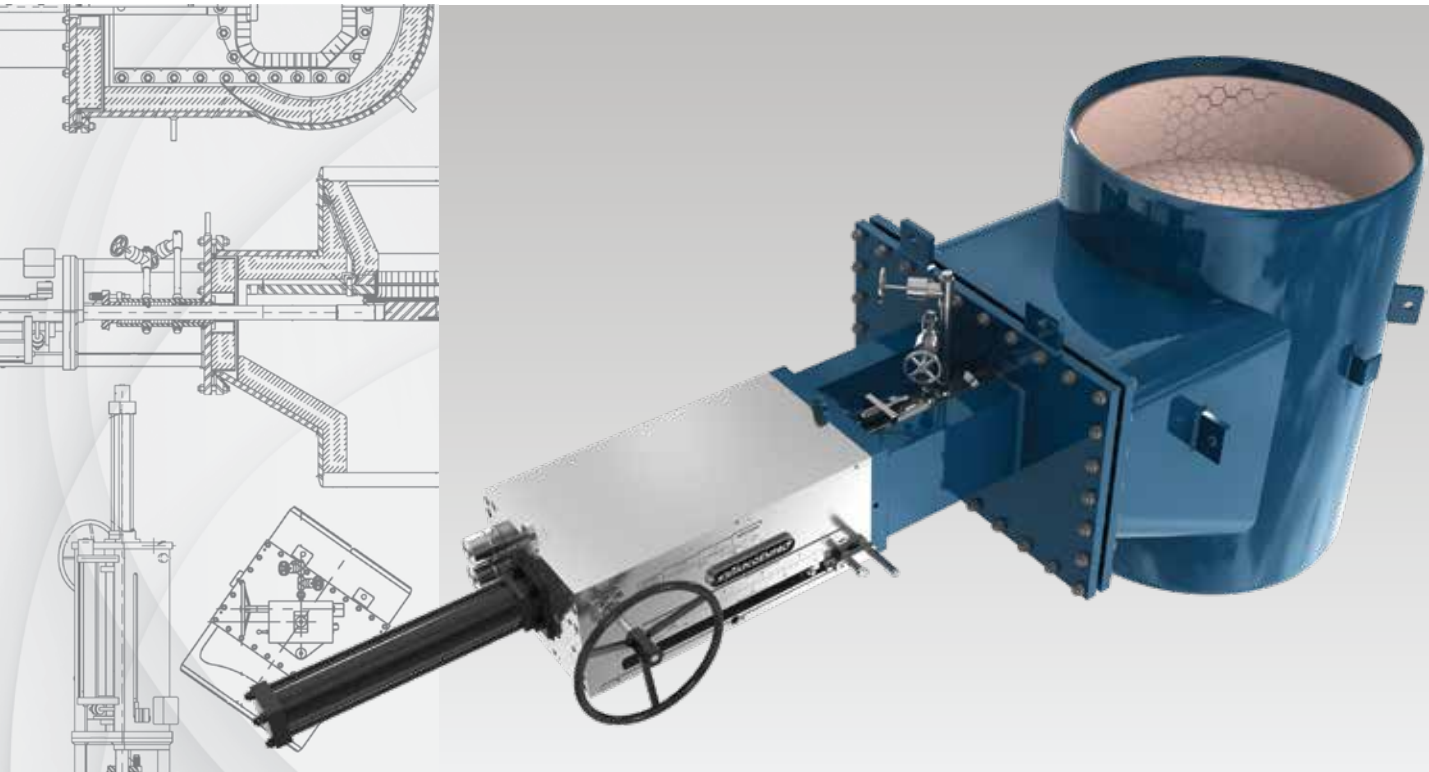


Coimbatore, India

For over 70 years, TapcoEnpro has been the world leader in the design and manufacture of critical service valves, equipment and services for Fluid Catalytic Cracking (FCC) Units.

We offer a full range of products including:

- Fractionator / Reactor Isolation Valves
- Spent and Regen Plug Valves
- Hydraulic Power / Control Units
- Flue Gas Butterfly Valves
- PLC / Digital Controllers
- Expander Butterfly Valves
- Flue Gas Diverter Valves
- Hydraulic Actuators
- Catalyst Withdrawal Valves
- Flue Gas Isolation Valves



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