



Mechanical Seals For Delayed Coker Units (DCU) In Refining Applications

With refinery feed applications becoming more viscous, acidic or sulfur laden, global refiners are preparing for heavier crudes and bitumen from the Middle East, Russia, Canada, Brazil and Venezuela. When selling at sharp discounts to light or sweet intermediates, heavier grades of oil now can account for about one-fourth of daily global supplies. Refiners must be able to convert this heavier crude into sellable gallons of gasoline, diesel and jet fuel.

Delayed Coker Units

Delayed Coker Units are the primary selection worldwide for the upgrading of heavy residues into usable liquid products due to their relatively low upfront capital investment. Despite the advent of fracking technologies and the production of lighter crude, heavy crude still occupies a large portion of the crude market today and will continue to in the future. In its simplest terms, delayed coking is a semi-batch thermal cracking process using alternating drums that are switched offline after filling. Support facilities include closed blowdown, coke cutting and handling, and a water recovery system. Hot residual oil is fed to the bottom of a fractionator where it mixes with condensed recycle. The combined stream is heated in the furnace to initiate coke formation in the coke drums. Coke drum overhead vapor flows to the fractionator where it is separated into wet gas, unstabilized naphtha, light gas oils, heavy gas oils and recycle. During the coke drum steam out and coking period, all steam and hydrocarbon vapors are directed to the blowdown system where they are recovered. After the coke drum cooling cycle is complete, the coke is hydraulically cut from the drum and dropped into a pit or pads where water is separated from the coke and recycled.

Coking Section

Mechanical seals for heavy oil feeds such as vacuum-reduced crude (VRC) combined with heavy coker gas oils (HCGO) from the fractionator to the coker heaters is a difficult sealing service. Low NPSHA and NPSHA drop at startup, due to furnace fouling, can lead to problem-causing, first-stage cavitation, reduced TDH and high axial thrust.

Fractionation Section

Coke drum effluent vapors are routed to a fractionator where they are separated into light gases, unstabilized gasoline, distillate, HCGO and a recycle stream. Mechanical seals are required to handle a wide variety of services, including fractionator bottoms, HCGO circulating reflux and product, light coker gas oils (LCGO), naphtha product, fractionator tower top reflux, lean sponge oil and sour water.

Vapor Recovery Unit

Vapor and liquid streams from the fractionator are further processed in the vapor recovery unit through absorber-stripped processes. Mechanical seals perform a wide variety of sealing services, including lean and rich amine transfer, stripper feed, lean oil, debutanizer reflux compressor suction drum, splitter overhead and bottoms, sour water, condensate and others.

Mechanical Seals Applications In DCU Processes:

RICH AMINE TRANSFER	QUENCH WATER	FRACTIONATOR RECIRC	COMPRESSOR SUCTION DRUM
Splitter Bottoms	LP Condensate	Fractionator Reflux	Stripper Feed
Splitter Overhead	LPG Condenser Recycle	LCGO Product	Lean Oil
Blowdown Lower Bottoms	Vacuum Resid	HCGO Product	Debutanizer Reflux
Blowdown Slop Oil			

Mechanical Seals and Systems for DCU Applications:

Safe and reliable handling of fluid is vital in today's hydrocarbon processing plants. Complex refining techniques generate a broad range of shaft sealing challenges. A growing focus on environmental protection demands continuous innovation in process containment. Sealmatic is committed with technology development and has developed sealing solutions for: Zero emissions on services containing volatile hazardous air pollutants. Specialized applications, including viscous refinery bottoms, polymerizing fluids and flammable gases. Corrosive, caustic, acidic, sour and abrasive products.

API 682

Sealmatic mechanical seals and support systems for the refinery industry satisfy all requirements of the latest 4th edition of API 682.

Typical Mechanical Seal Applications

Acids, Amine, Caustic, Flashing Hydrocarbons, Non-flashing Hydrocarbons, Hot Hydrocarbons, High-pressure; High-viscosity Hydrocarbons, Water, Water — Sour, Water — Hot

Specialty Applications

- Low-temperature Containment Seal
- High-temperature Containment Seal
- Pressurized Pump Gas Seal

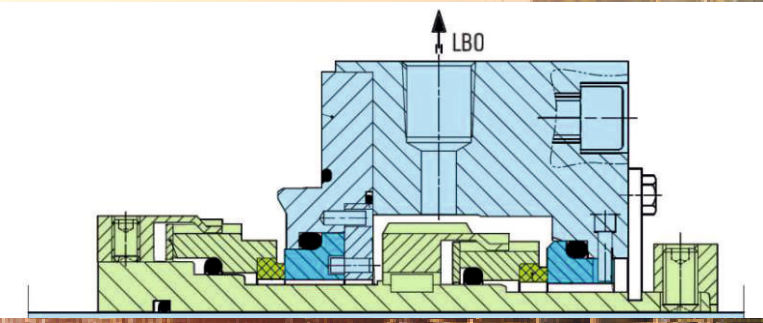
API 682 4th Edition

Sealmatic Product Locator For Mechanical Seals

Category			Category 1								
Configuration			1CW-FX	2CW-CW	2NC-CS	3CW-FB	3NC-BB				
Mechanical Seal	Seal Type A	Rotating	CTX-API-SN	CTX-API-DN	GSPH-Ta	CTX-API-DN	GSPH-KD				
		Stationary									
Category		Category 2 and 3									
Configuration		1CW-FL	2CW-CW	2CW-CS	2NC-CS	3CW-FB	3CW-BB	3CW-FF	3NC-FB	3NC-BB	3NC-FF
Mechanical Seal	Seal Type A	Rotating	B750VN	B750VK	B750VK-GSPH	GSPH-Ta	B750VK	B750VK-D		GSPH-KD	
		Stationary	SB	SB-Ta			SB-Ta		SB-D	BGSR-Ta	GSR-D
	Seal Type B	Rotating	UFL850	UFL850-Ta			UFL850-Ta	UFL850-D			
		Stationary	UFL650	UFL650-Ta			UFL650-Ta		UFL650-D		

API 682 4th Edition Code

Mechanical Seal			Design Options			Size	Plans
Category	Arrangement	Type	Containment Device	Secondary Seal Material	Face Material	Shaft Size	Piping Plan
2	2	A	P: Plain gland	I: FFKM (Inner position) F: FKM (Outer position)	N: Carbon vs Reaction Bonded Silicon Carbide	050	02/52



Seal designation: 22A-PI/FN-050-02/52

