

CRANE VALVE GROUP



Hydrocarbon Cracking



Pacific Valves

CRANE[®]
Energy Flow Solutions

PACIFIC HYDROCARBON CRACKING AND HIGH PRESSURE STEAM VALVES

FOR THE TOUGHEST REFINERY SERVICES

Pacific Wedgeplug and Pressure Seal valves can be found in the toughest refinery services – hydrocracking, FCCUs, ethylene cracking, delayed cokers, asphalt production and many others. Pressure Seal valves are also employed plant-wide in difficult high pressure steam applications.

Tens of thousands of Pacific valves installed in hundreds of refineries around the world offer unequalled reliability, quality, peace of mind and:

- More than 60 years of refinery proven performance
- Dependable, long-lasting shutoff
- Conformity to ASME, API and other industry standards for design and performance

HYDROCARBON CRACKING VALVE APPLICATIONS

- Catalyst handling (FCCU)
- Diesel pump
- Coker transfer and overhead
- Boiler feedwater pump
- Charge pump
- Fire water pump
- Power recovery turbine
- Reactor
- Recycle pump
- HP and LP separators
- Splitter charge pump
- Fractionator
- Stabilizer feed and reflux pumps
- Water services (drain water, sour water, cooling water)
- Heavy naphtha pump
- Kerosene pump



COKING

PROFITS FROM THE BOTTOM OF THE BARREL

Coking is an important process in the production of clean fuels from heavy, high sulfur content crudes. By converting heavy residues such as flasher bottoms and cycle oil into usable products, coking adds output and profit while eliminating residue. It also eliminates the need for catalyst, thereby reducing cost and environmental concerns. Its products include light gases (LPG and refinery fuel gas), naphtha (gasoline pool), gas oil (blended for No. 2 heating oil, refinery gas, jet fuel, diesel) and coke (fuel, electrode and metallurgical uses).

Pacific Valves is a proven performer throughout this bottom-of-the-barrel residual conversion process. They can be found in all the process stages including:

- Separation (vacuum distillation, solvent deasphalting)
- Thermal processes (delayed coking, fluid coking, flexicoking, visbreaking)
- Catalytic conversion (residue hydrocracking)
- Thermal hydrocracking
- Decoking



FCCUS

HIGH VERSATILITY WITH HIGH PROFITABILITY

There are several reasons why FCCUs are at the heart of the refinery. First, they are readily adaptable to changing feedstocks and shifting market demand. Then there is the relatively high margins of converted FCC products versus the cost of the feedstocks. And finally, the gain realized as refiners “fluff up the barrel” is an added benefit.

The conversion of straight-run heavy gas oils, flasher tops and cycle oil in FCCUs is hot, nasty business. But converting these heavy cuts into gas, gasoline, light and heavy gas oils creates a valuable revenue stream. And it also creates residue and coke which Pacific Wedgeplug valves are ideally suited to handle.

No matter what the FCCU application – Reactor, Regenerator, Fractionator – Pacific Wedgeplug valves will handle catalyst-related erosion and temperature conditions as well as the challenges of coke build-up and erosion along with residual freeze up.



ETHYLENE PLANTS



TURNING TRASH INTO TREASURE

As a basic building block for many of the products it produces, the chemical processing industry has an insatiable appetite for ethylene. And this provides an excellent profit opportunity for refiners as they can convert low value junk streams into a high demand, salable product.

Ethylene plants employ thermal cracking to make ethylene, propylene, fuel gas and gasoline from cast-off ethane, propane, butane, naphtha and gas oil.

Lighter feedstocks require a relatively simple process of cracking, quenching and fractionation. Heavier feedstocks, however, require extra separation units. Maximum ethylene recovery from heavier feedstocks also requires additional columns and a cryogenic unit.

Regardless of the operating conditions – from 1100°F (595°C) to -300°F (-185°C), Pacific Wedgeplug valves can meet the challenge with long-lasting, reliable, maintenance-free performance.

HYDROCRACKING

A TOOL OF UNMATCHED FLEXIBILITY

The importance of hydrocracking continues to grow because of the significant production flexibility it provides refiners. Equally important, hydrocracking is the best source of low-sulfur, low-aromatic diesel fuel as well as high-smoke-point jet fuel in this environmentally conscious world.

Additional benefits of hydrocracking include:

- Production of gasoline components from light or heavy gas oils
- Production of large amounts of isobutane to feed alkylation units
- No bottom-of-the-barrel leftovers
- Outturn of all light oils
- Simultaneous quality improvement of both the gasoline blending and distillate fuel blending pools

Converting heavy aromatic feedstock into light product by hydrocracking, however, requires brutal process conditions with pressures as high as 2000 psi (140 bar) and temperatures which can approach 1500°F (800°C). That requires equipment with guaranteed reliability. The reliability that Crane's Pacific Valves has been providing for more than 60 years.

Hydrocracking technology is continually improving, and Crane's Pacific Valves will continue to be the valve of choice for this critical refinery service.



PRESSURE SEAL VALVES

UNEQUALED PERFORMANCE AND RELIABILITY

For more than 60 years, Crane has been providing refineries with drop-tight shutoff and leak-tight stem seal valve performance. Specifically, Pacific Valves' line of Pressure Seal Valves delivers total quality and complete reliability in hydrocarbon cracking and high pressure steam applications.

- Pressure Seal's simple design provides maximum bonnet sealing
- Backseat, disc and seat ring surfaces of all valves are hardfaced for long service life
- Globe and stop-check valves are renowned for reduced system pressure drops, thus increasing overall plant efficiency
- Gate valves eliminate thermal compensation devices, a costly requirement with torque-seated valves in applications above 900°F (480°C)
- Tilting disc check valves are designed for quick opening and closing in severe service applications and elimination of water hammer
- All valves feature designs permitting easy maintenance and in-line repair

PRESSURE SEAL GATE VALVES

Ideal for isolation service, these gate valves are available in either flexible wedge or parallel seat designs.

The one-piece flexible wedge is fully guided, resists sticking or binding due to thermal expansion and effects a tight seal in low differential pressure services. The forge strengthened stem-wedge connection allows the wedge to self-align, thereby eliminating wedge jamming.

The parallel seat design's self-aligning spring-loaded discs is a best choice where high differential pressure, high piping loads or thermal expansion may cause sticking of a wedge-type gate. Low seating torque reduces actuator size and cost.

PRESSURE SEAL TILT DISC AND LIFT CHECK VALVES

The Pacific design fully and rapidly opens or closes through an arc of 45°. Conical seating at an angle of flow is self-aligning, tight and always closed in a no-flow situation – even in vertical pipe runs. Large diameter hinge pins and corrosion resistant bearing surfaces deliver long life in tough services. The unique internal disc hanger eliminates a potential leak path while allowing seat/disc adjustment if seat repair becomes necessary.

Significantly reducing galling or sticking problems, Pacific's lift check valve uses a globe valve body with a piston to provide reliable backflow prevention and pressure maintenance.

PRESSURE SEAL GLOBE AND STOP-CHECK

Versatile performers, these valves may be used for on-off and throttling applications. They are available in Y and T pattern body designs. The stem-gland-disc design assures self-alignment, tight sealing in high pressure services.

Stop-check valves provide the same function as the globe valves with the addition of a piston-lift check valve for backflow protection.



WEDGEPLUG

THE FIRST CHOICE IN HYDROCARBON CRACKING

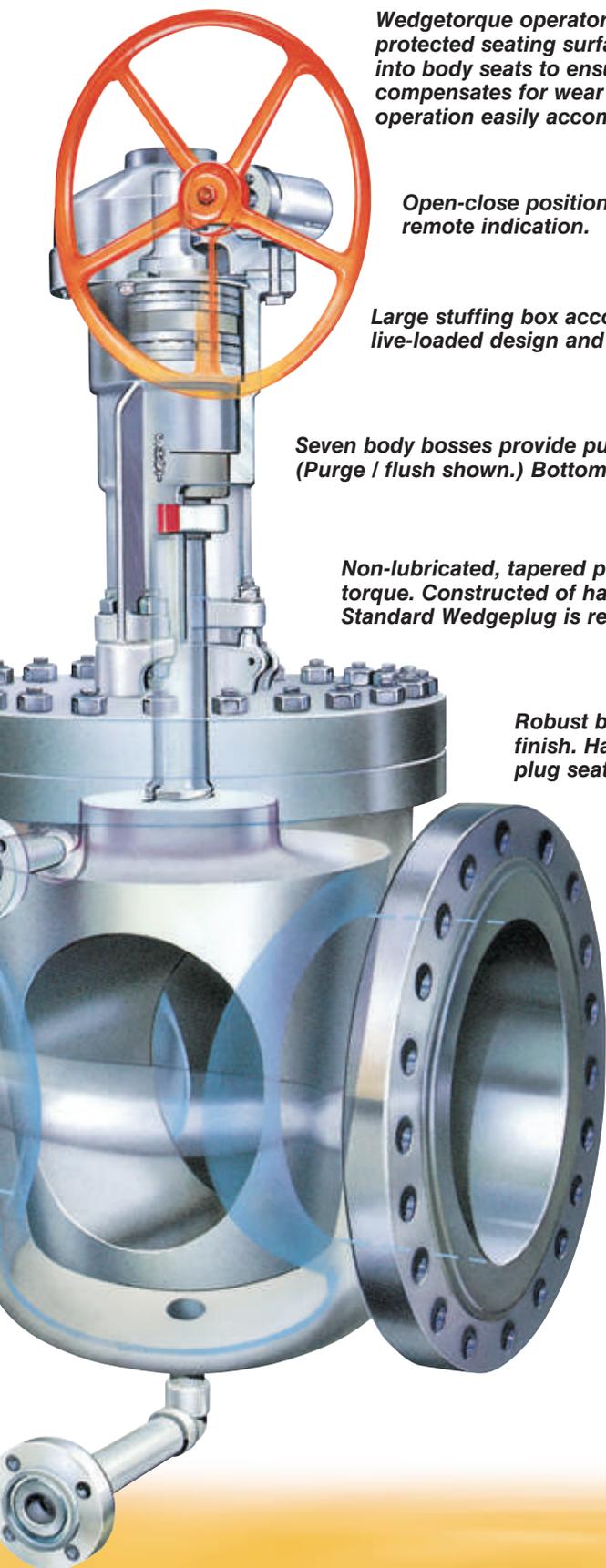
Key Features:

- Simple construction with only three major parts
- In-line repairability
- Simple purge options
- Fully protected, integral metal sealing surfaces
- Bi-directional sealing with double block-and-bleed capability
- Easy Wedgetorque operation

Problems Solved:

- Velocity damage/erosion from catalyst
- Coke and catalyst build-up in sealing areas and cavities
- Residual freeze up preventing operation
- Packing wear and stem leakage





Wedgeplug operator lifts, rotates 90° and reseats plug on its protected seating surfaces. Positive mechanical thrust drives plug into body seats to ensure tight bi-directional line seal. Automatically compensates for wear and temperature changes. Automated operation easily accommodated.

Open-close position indicator. Limit switches for remote indication.

Large stuffing box accommodates all packing arrangements, including live-loaded design and lantern ring type for severe services.

Seven body bosses provide purge, flush, drain or bypass connections. (Purge / flush shown.) Bottom boss is furnished with standard pipe threads.

Non-lubricated, tapered plug assures tight seal with low breakout torque. Constructed of hardened materials with optional hard facing. Standard Wedgeplug is reduced port.

Robust body with raised seating surfaces ground to mirror-like finish. Hard plug and body seat facings available. Body and plug seats protected from line media in open-close positions.

Integrally cast body ribs, running parallel and perpendicular to the pipe axis, impart additional strength for high pressure conditions, thermal pipe loads.



The optional Q-plug provides full port flow along with less weight and easier maintenance. Other enhancements include trunnion mounting to eliminate side loads for prolonged seat life; tangential purge; and heavy-duty mounting yoke design.



PRODUCTS

WEDGEPLUG VALVES

- ASME Class 150-900
- Cryogenic to 1650°F (900°)
- Sizes: 1/2 in (15 mm) thru 48 in (1200 mm)
- Plug port reduced (70%, 90%) and full bore (100%)
- Designed to the requirements of
 - API 599
 - ASME B16.5 flanges
 - ASME B16.10 face-to-face
- Flanged, threaded or butt-welded end connections
- Materials include WCB, WC6, WC9, C5, C12
- Special configurations and alloys available



PRESSURE SEAL VALVES

All feature pressure seal bonnet and are available in WCB, WC6, WC9, C12A, 316H, 321H, 347H and other SS materials

GATE VALVES PRESSURE SEAL

- Flexible wedge and parallel disc designs
- ASME Classes: 600, 900, 2500
- Standard and special class
- Sizes: 2 in (50 mm) to 24 in (600 mm)
- Raised face and ring joint flanged; butt-weld and venturi ends



Y-GLOBE VALVES PRESSURE SEAL

- Y-pattern stop, stop-check and lift check designs
- ASME Classes: 600, 900, 1500, 2500
- Standard and special class
- Sizes: 6 in (150 mm) to 24 in (600 mm)
- Raised face and ring joint flanged; butt-weld and venturi ends
- Superior C_v and port diameters



T-GLOBE VALVES PRESSURE SEAL

- T-pattern stop, stop-check and lift check design
- ASME Classes: 900, 1500, 2500
- Standard and special class
- Sizes: 2 in (50 mm) to 14 in (350 mm)
- Raised face and ring joint flanged; butt-weld and venturi ends



TILT DISC CHECK VALVES

- Non-slam design
- ASME classes: 900, 1500, 2500
- Standard and special class
- Sizes: 2 in (50 mm) to 24 in (600 mm)
- Raised face and joint ring flanged; butt-weld and venturi ends



PRESSURE SEAL LIFT CHECK VALVES

- Non-slam design
- ASME classes: 900, 1500, 2500
- Standard and special class
- Sizes: 8 in (200 mm) to 24 in (600 mm)
- Butt-weld and venturi ends

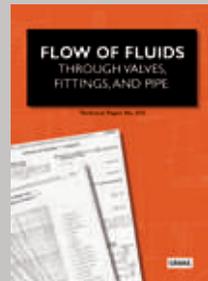




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Energy Flow Solutions

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