CAMERON
A Schlumberger Company

Valve Solutions for Onshore Production

Valves and valve services for accurate, zero-leakage product segregation to increase uptime and safety

ControlFluid

- Separation
- Wastewater disposal
- Tank battery
- Recovery
- SAGD and oil sands

Safe. Rugged. Convenient.

Cameron has a complete portfolio of dependable, field-proven valve and automation solutions that reduce downtime and increase safety for onshore production operators and skid manufacturers. Trusted for years in the field, our valve technologies have emerged from solid, application-specific engineering for rugged dependability. Our strategic network of distributors and agents deliver these solutions quickly and economically, all around the world. All backed by one of the most comprehensive life cycle programs in the industry for complete life-of-field support.

Separation

Unplanned interruptions in the separation process are most often caused by valve leakage due to scratches on the ball-to-seat interface from the raw, dirty fluids. Our WKM* 210 and 310 floating ball valves were specifically designed to handle these demanding applications, utilizing a Nitrided 316SS ball and HVOF Nickel coating over 316SS seats to make the ball-to-seat interface withstand the damaging effects of ingress.

As the first line of defense against exposure to the environment and personnel, these valves also utilize class V bi-directional seat sealing to seal tightly under the varying pressures and potential liquid surges (slugs) from the incoming flowlines.

Reverse flow and cross-contamination in the heater treaters, and other expensive equipment, can cause costly repairs. TOM WHEATLEY* and WHEATLEY* check valves have been trusted in the industry for years for their reliable backflow prevention with a full bore design that maximizes the flow area to reduce pressure loss.

Our WKM soft-seated, small bore floating ball valves are routinely selected for flare and utility lines because of their light, compact design, while the more robust design of the WKM D series trunnion mounted ball valve is ideal for feed lines.

High-quality, rugged valves that work when they arrive are essential to reducing downtime and Cameron utilizes a global network of strategic distributors and partners around the world to deliver new valves to skid manufacturers, replacement valves for existing fields, and complete valve packages for projects.

Valves used during separation must be designed to last since the process fluids may still be corrosive and contain abrasives and chemicals.

Wastewater Disposal

The water used in various processes, whether from processing applications or extracted from oil, must be disposed of safety as regulated by federal laws, including the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA). This can be achieved by storing the water in tanks or reinjecting the water thousands of feet into underground wells. These applications, however, would quickly destroy a standard carbon steel valve. Our WKM floating ball valves in stainless steel and DEMCO gate valves in aluminum bronze are routinely chosen for these unique challenges because of their ability to withstand the corrosive effects of the wastewater.

There are three methods of wastewater disposal: surface water discharge, subsurface discharge, and land application for beneficial use (also known as reuse).

Tank Battery

To avoid costly contamination and product loss, many operators incorporate line blinds in their tank systems. The use of line blinds for segregation, however, involves a long, costly, and perhaps hazardous process of drain down, lockout, and tag out. Complicating this even more, installing and actuating critical service valves to meet the strict sealing requirements of this application can also prove problematic due to space and weight limitations.

Our WKM triple offset valve (TOV) is designed to handle the most difficult isolation situations whether it is high cycle, thermal extremes, or space and weight savings. The life cycle tested valve has been designed to help extend the life of piping systems by providing reliable bi-directional sealing in a compact, easily-actuated design.

The inlet valve on a tank needs to withstand, and close against, high pressures routinely as it stores the various liquids, gases, and produced water. Due to their pressure-assisted sealing, while still sealing at low pressures, WKM floating ball valves are routinely utilized for this inlet valve. WHEATLEY check valves can be packaged with these ball valves to prevent any backflow in the line and to provide a secondary barrier to product release for increased safety.

Inlet valves on a tank need to be able to withstand, and close against, high pressures routinely as it stores the various liquids, gases, and produced water.

Recovery

The fluids used in the various recovery phases are extremely expensive, and are recycled for use throughout the life of the field. Zero-leakage† valves keep the dangerous chemicals that are in the recovery fluid from escaping to the environment, while making sure that expensive reservoir fluids are not lost.

The valves in this application experience high temperatures and pressures on a regular basis. Not only must they seal reliably to avoid costly fines and product loss, but the efficiency of the unit also hinges on reliable valve performance. With upwards of 50 small bore floating ball valves on each unit, being able to acquire these quickly and all around the world is critical to increasing uptime and ROI.

The TEXSTEAM Super G plug valve has a long history of providing reliable isolation in corrosive wet CO^2 and water flood applications within the recovery process. The 70 Rc hard-coated plug design allows the valve to withstand this harsh environment, while an internal sealant path provides sealing even on damaged seats. These features work in tandem to extend the service life of the valve and lower the operating torques.

† Per API 598

Zero-leakage valves are ideal for various recovery phases due to the fact that the fluids used are extremely expensive, and are recycled for use throughout the life of the field.

Deepwater solution

Recovery stage	Recovery factor†	Challenges	Valves solutions
Primary	5–15%	Varying, unpredictable pressures from the well	Designs qualified for pressures up to 10k psi
			TEXSTEAM Super G plug valves incorporate an integral plug and stem for a blowout-proof plug
Secondary	35–45%	Corrosive effects of steam or CO^2	Bronze and stainless steel construction materials available
Enhanced	5–15%	High temperatures	Fire-tested designs per API 607‡

† According to a study conducted by the European Commission Joint Research Center in 2012; actual recovery rates are determined by a number of factors.

‡ On WKM 210 and 310 floating ball valves; TEXSTEAM Super G Plug valves are fire-tested in accordance with API 6FA

SAGD and Oil Sands

Triple offset valves (TOVs) are routinely selected to meet the high-temperature, limited space requirements of saturated and superheated steam distribution in SAGD. WKM TOV utilizes a true triple offset geometry to provide bi-directional zero-leakage‡ shutoff and fits varying installation requirements with lug, short (ISO), and long pattern. Our network of distributors stock these valves around the world for quick-turn delivery. For custom challenges, our dedicated engineering and manufacturing team can design and build a fit-for-purpose solution for any steam distribution application.

The duplex stainless steel and Stellite seating configuration of the WKM TOV has been engineered to withstand the particularly abrasive, corrosive service environment found in SAGD and production applications. Designed and tested to perform reliably after thousands of cycles, the design of the WKM TOV helps extend the service life of the production system.

‡*See case study on the next page*

SAGD produces a smooth, even production and when in operation at reservoir pressure, instability problems that plague all high pressure steam process are usually eliminated.

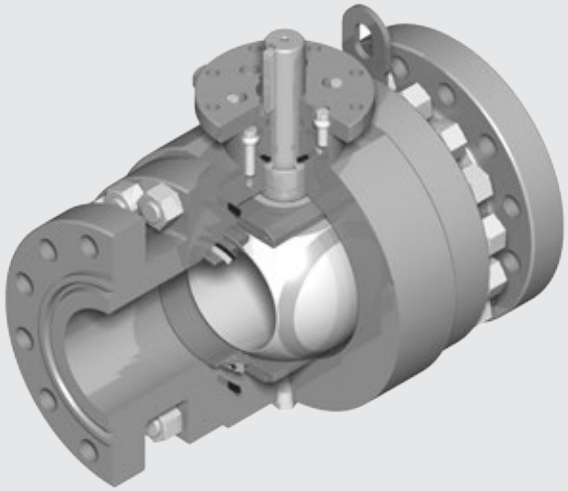
CASE STUDY Metal-to-metal sealing. Forged steel body. Proven in oil sands.

The Customer Challenge

The customer needed a rugged, high-performance, metal-seated ball valve for froth treatment and slurry production processes in heavy oil mining and steam injection for SAGD and production systems in Western Canada. Since moving to modular construction, the customer had a need to reduce space, weight, actuation, and delivery requirements.

The Cameron Solution

Utilizing our well-established valve sealing technologies, enhanced with several advancements, including high-velocity oxy fuel (HVOF) coating technology and sophisticated design analysis tools such as finite element analysis, we developed the NUTRON* TM series ball valve. With our local Edmonton manufacturing facility, we delivered a top-quality, proven product that was able to meet the space, weight, and short delivery requirements of SAGD modular construction.



API 6A Gate Valves

We offer a complete portfolio of API 6A gate valves for onshore production including applications such as large-bore completions, frac service, HPHT/ ultra-HPHT, wellhead, Christmas tree, and steam service. As an OEM, Cameron is committed to designing, manufacturing, testing, installing, and servicing premium gate valves with the highest degree of precision and quality.

Industry-leading sealing technology is incorporated into every design and we undertake constant improvement initiatives to develop new design concepts, such as the FLS-S wedge-slab gate valve with split-gate design that has two slab gates in the same valve cavity to allow a flow line seal test to be performed simultaneously in both flow directions. Our efforts to provide reliable valves carry over into customer service, a dedication to quality assurance, intensive service personnel training programs, and our global network of service facilities. Stringent procedures are followed to maintain valve integrity throughout service life.

Our API 6A gate valve product line provides:

- Technology validated from 2000-psi to 30,000-psi working pressures and temperature coverage from -75 to 650 degF (-60 to 345 degC)
- Sealing designs that increase gate valve dependability
- Components constructed of carefully selected alloys suitable for severe service applications
- Expanding and slab gate designs, each with its own recognized strengths
- Cast and forged bodies

Cameron engineers selected the best suited features for development and implementation into our API 6A gate valve product line. Our valve line includes some of the world's most successful and widely recognized gate valves for onshore production.

Services

Field Services

Unlike other valve manufacturers, Cameron has an established network of strategically located field service centers that offer a full range of installation, repair, inspection, testing, spare parts, and maintenance services along with 24/7 field service support and emergency mobilization.

Off-road trucks and portable onshore trailers

For faster reaction times and onsite flexibility, our fleet of customizable, fully equipped trucks, trailers, and containers keeps valve support close to onsite customers for their convenience.

Preventive maintenance

Customized preventive maintenance programs are designed to provide optimum valve performance and increased reliability for both onshore and offshore facilities. Cameron provides key performance indicators and asset history trails to help technicians detect early stages of reduced efficiency and compromised valve integrity to prevent loss and early failures.

Customer property management

Property management programs extend the life and reduce the lead times and total cost of ownership of your assets while adding value to your asset recovery programs.

Fugitive emissions

Concerns about fugitive emissions have been a part of the industry for years. All standard Cameron floating ball valves are designed to meet the industry specified FE standard of 500 ppm. Adding adjustable stem packing to Cameron WKM 310 series floating ball valves, when tested in-house, reduced fugitive emissions to 100 ppm.

Cameron is one of the most respected names in the valve business, and our team is ready to respond at a moment's notice or as part of your long-term valve asset management program.

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