



Valve Solutions for Liquid Tank Storage

Increase uptime and safety with high-quality valves and valve services for accurate, zero-leakage product segregation



Multi-product manifolds

Tank storage isolation

Custody transfer

Metering skids

Loading and unloading

Valve Solutions for Liquid Tank Storage

As a total solution provider, Cameron is the OEM for a broad portfolio of valve technologies, as well as comprehensive automation systems and complete life-of-field services for liquid tank storage applications. Product cross contamination in storage facilities can lead to costly downtime, environmental damage, product loss, and dangerous working conditions. Our easily-automated valves play an integral part in ensuring reliable and accurate product segregation on difficult to reach manifolds even when handling harsh process fluids. Supported by complete life-of-field services and a team of valve experts with over 70 years of experience in the tank storage industry, Cameron helps you increase uptime and safety for all storage applications, globally.

Multi-Product Manifolds

Liquid storage environments, busy manifolds must be operated frequently, switching from product to product, often with power actuators and sometimes without onsite supervision. Product segregation is the ultimate goal in a multi-product manifold tank and terminal facility. The risk associated with cross contamination of refined products and crude grades can result in product loss, unnecessary rework, and even product downgrading. Costs incurred from the mishandling of stored product falls on the terminal operator, which can significantly impact the facility's operating expenditures.

A common cause for cross-contaminating products is valve slip-seal failure due to improper seal compatibility. Selecting the right valve technology is a critical part of the engineering and construction process for tank and terminal facilities. The valves within the facility must seal drop tight, every time to prevent the expensive consequences of contaminated product. The primary valve technology that meets the rigid requirements is a double block-and-bleed (DBB) plug valve because the mechanical wedge-action of the valve compresses both the upstream and the downstream seals firmly against the valve body, needing no help from the line pressure.

Our GENERAL VALVE* Twin Seal* positive shut-off, double block-and-bleed plug valve was developed specifically for busy multi-product manifolds. Today, refined products that move through pipeline manifolds are reliably segregated by zero-leakage[†] GENERAL VALVE Twin Seal plug valves that have a proven in-field track record. In manifold applications, these valves provide double block-and-bleed shutoff that proves total isolation of each product. GENERAL VALVE Twin Seal plug valves have been employed to avoid cross-contamination for a variety of process fluids, including: gasoline, diesel, kerosene, jet fuel, heating oil and LPG, as well as crude oil and natural gas.

[†] Per API 6D 11.4.3 acceptance criteria



The mechanical wedge-action of the plug of the GENERAL VALVE Twin Seal valve compresses both the upstream and the downstream seals firmly against the valve body, needing no help from the line pressure.



Busy multi-product manifolds require valves that can withstand the high-cycle environment with zero-leakage capabilities.



Tank Storage Isolation

In tank storage applications, operators are faced with the risk of contamination and loss of volume unless tank isolation valves perform with zero-leakage. When these valves fail, they leave systems vulnerable to product loss. To avoid this, many operators incorporate line blinds in their systems, but the use of line blinds for segregation involves a long, costly, and perhaps hazardous process of drain down, lockout, and tag out. Complicating the solution even more, installing and actuating critical service valves to meet the strict sealing requirements of this application can also prove problematic due to space limitations.

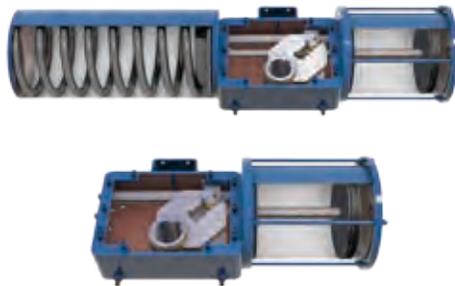
Our WKM* triple offset butterfly valve (TOV) is designed to handle the most difficult tank storage isolation situations whether it is high cycle, thermal

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 sealing in a compact, easily-actuated design. Engineered and qualified by our experienced valve team, customers benefit from a host of features specifically targeted for liquid storage and transport of crude oil, refined products, chemicals, or LNG.

In addition to our valve solutions for tank storage isolation, our portfolio of power actuation technologies includes the LEDEEN* pneumatic and electric actuators. The consistent engineering design and efficient modular assembly allows increased operational flexibility to be achieved.



The WKM triple offset valve is a smaller, lighter valve that is easily installed next to a tank.



LEDEEN pneumatic actuators



LEDEEN electric actuators

Custody Transfer

Inbound and outbound product transfer in a tank and terminal facility requires precision. For example, in a daily lease production site running at 2,000 barrels, the lost revenue from gauging (per year) at 1% is approximately \$511,000. Utilizing a LACT unit with accuracy that is provable to 0.25% saves an average of \$383,250 per year.[†] In order to prove the unit, however, the valves have to seal reliably, every time. Whether it be liquid or gas, accuracy is paramount when products are exchanged and ownership shifts. It is critical to use well designed, reliable valves during custody transfer as the threat of product loss can have extensive impact on financial profitability.

[†]Based on oil at \$70/barrel

Whether a terminal is in pre-commissioning, post-commissioning, or is a mature operation, we have a comprehensive package to deliver complete valve management solutions. This can start as early as pre-shipping for valve preservation or after years of operation for flange management and valve base lining. GENERAL VALVE Twin Seal plug valves can be quickly and locally verified to be holding a leak-tight seal to help ensure accurate meter calibration.

CASE STUDY

Packaged solutions for simplified commissioning

The customer challenge

A tank and terminal project was started near Edmonton in 2006 for multi-product liquid transport and custody transfer, where multiple flows could not mix with each other and the valves needed to seal tightly and quickly, every time. The custody transfer involved transporting crude oil, diluent, and condensate from one product pipeline to another on its way from producers who blended the oil to refiners who delivered the final product. Not only did the valves have to seal reliably, but they also had to withstand the frequent cycling of the process.

The Cameron solution

Cameron offered a packaged solution, taking responsibility for the engineering expertise, pricing, delivery, installation, and service of the 250 valve units that were installed. Working with an actuation provider in the US, Cameron was able to assemble, test, and ship the valves directly from their Little Rock, Ark. facility to the project site. This simplified the commissioning process, ultimately reducing time and total cost of ownership for the terminal operators.

These busy manifolds were constantly cycling product, making maintenance of the pipelines necessary. The valve's mechanical seal and retracting slip design minimized seat wear and the in-line reparability resulted in less maintenance and reduced downtime. On a quarterly basis, all critical valves were inspected, and when needed, serviced by Cameron local life-of-field services team while still in-line.

The result

Based on the valve's solid performance record, Cameron was awarded the expansion contract to supply 89 additional GENERAL VALVE Twin Seal plug valves for the critical, positive shut-off applications, encompassing 80% of the purchased valves for the planned additional seven tanks.



Metering Skids

Due to the constant inbound and outbound transfer of client product, accurate flow meters are the lifeline of tank and terminal application integrity. Pipeline flow meters require calibration to verify their accuracy. During meter calibration (bi-directional proving) every closed valve in the meter system must seal drop-tight. Even a small leak will cause errors in the meter calibration process. In this case, an incorrect meter factor will persist until the next proving operation and can incur huge costs associated with product loss.

The solution is a heavy-duty, high-cycle diverter valve. Our GENERAL VALVE four-way diverter valves feature no-leak stream separation and a long seal life. These valves do not rely on line pressure for positive sealing. Additionally, the ability to perform maintenance on the valve in-line cuts operating costs and downtime.

We also offer a complete line of cast, forged, and stainless steel gate, globe, and check valves in a full range of sizes and classes. All are inspected and tested in accordance with the most rigid quality standards and include ready-to-ship inventories and competitive lead times, which together allow your storage facility to come on line faster and operate safer.



Cameron valves can also be used on CAM-LACT units, which are in stock and ready to ship when dependable lease automatic custody transfer (LACT) equipment is required.*



The seating segments can be removed from the top or the bottom and examined without having to take the valve from the line or disturbing the actuator.



Our quick-turn, stocked NEWCO gate, globe, and check valves are regularly utilized on LACT units and metering skids around the world.*

Loading and Unloading

Not only do valves in fuel loading and unloading face high-cycle demands, but they also typically operate against full pump pressure. The valve must seal without leaking, every time, in order for operators to avoid contamination of the environment, hazards to personnel, and costly product loss. Safety and environmental concerns demand that the fuel is absolutely and totally contained within the pipe, yet the valves must operate quickly and easily.

GENERAL VALVE Twin Seal valves employ two resilient seals that fully retract from their seated position without any seal rubbing, even at full differential pressure, reducing the effort required to operate the valve and making it slam-proof.

Our WKM high-performance butterfly valves are engineered for reliable, repeatable sealing in fuel handling systems. The heavy-duty disc design is ideally suited to withstand the pressures associated with fuel loading/unloading and the wide disc edge provides a greater sealing area than traditional butterfly valves. A corrosion-resistant, single-component thrust bearing/disc spacer reduces body wear and helps ensure positive centering of disc in the valve bore, reducing the maintenance requirements of this valve.



WKM high-performance butterfly valves provide low cost and lightweight solutions to demanding fuel loading and unloading applications.

Services

As the largest service network for valves operating in the global oil and gas industry, the Cameron service network is there, whenever and wherever you need it.

For storage, terminal, and pipeline operators, the Cameron service team is ready to meet routine, emergency, or preventative maintenance challenges.

- 24/7, 365 days a year support
- Dedicated stocking program
- Field service support and emergency mobilization
- Portable meter proving
- Asset preservation
- Customer property management
- Equipment testing and diagnostics
- Training and recertification programs

Cameron offers customized asset management plans that optimize uptime, availability, and dedicated services.

For greater flexibility and improved cost control, we offer valve service partner solutions and a complete valve management program designed to optimize uptime, availability and life-of-field support. The program provides management support specializing in high-specification project work, existing operations with vast installed bases, and new development opportunities. Our support covers standard and critical valves ideal for extreme environments and remote areas of the world.



Our valves are supported by complete life-of-field services and a team of experts with over 70 years of experience in the tank storage industry.

Valve Solutions for Liquid Tank Storage



cameron.slb.com/valves

*Mark of Schlumberger
Other company, product, and service names
are the properties of their respective owners.
Copyright © 2016 Schlumberger. All rights reserved. VL-1003

 **CAMERON**
A Schlumberger Company