

Valves for High Pressure Steam Applications



C.G. Industrial Specialties Ltd.



Leaking Valves = Leaking Money



Figure 1 & 2:
Steam escaping leaky valves

Testing valves for leakage costs little, but can save a lot. Energy drops across many valves exceeds 1,250 BTU/lb., and fuel costs range from \$1 to \$10 per MMBTU. A single valve with a modest leak can be responsible for \$10,000 to \$100,000 in lost fuel costs during just one year of operation. For a valve that costs as little as \$3,000 to replace, that equates to internal rates of return on replacement in the hundreds and thousands of percent over a conservative four-year life cycle.

The numbers add up quickly – with hundreds of valves in service, total loss recovery can total as much as 3% or higher in terms of overall plant efficiency.

High Pressure Steam – ZERO Leakage

CG Industrial Specialties Ltd (CGIS) provides the World's Best Valves to power and oil companies around the globe. We've teamed up with some of the world's leading valve manufacturers to provide a wide range of valves suited for high-pressure applications. For example, Valvtechnologies (VTI) provides world class metal seated ball valves for severe service applications such as Thermal Enhanced Oil Recovery (TEOR) & Thermal Power.

VTI is an established company with a worldwide reputation for superior quality and dependability. Valvtechnologies' carbide coated integral metal seated ball valves are built to withstand the most severe applications.

No Such Thing as Allowable Leakage

The tightest ANSI/ASME classification, Class VI, allows a 6" valve to pass 5.76 litres (1.52 US gallons) of fluid downstream of the closed valve in a twenty-four hour period. That amounts to 554.8 gallons a year – and that's from a new valve!

ValTechnologies' unique metal seated ball valves are tested for ZERO Leakage, exceeding class VI shut-off

This Zero Leakage capability ensures that VTI's valves are capable of withstanding even the toughest of applications.

Thermal power plants require large amounts of high pressure steam to generate electricity. A typical thermal power plant converts water to steam. This steam travels at a high velocity and turns the turbines which generate electricity.

The consequences of steam escaping through leaking valves are considerable – unproductive at best, life threatening at worst.

Steam escaping through leaky valves results in decreased pressure being applied to the turbines and consequently, reduced efficiency. When a valve is closed the high pressure differential could cause severe damage to the valve through erosion (wire drawing).

In these scenarios it is imperative that ZERO Leakage valves be used.

Valves to meet any challenge

Challenge: Steam used in Thermal Enhanced Oil Recovery (TEOR) is usually dirty and contains non gaseous elements such as chlorides, calcium and carbonates that harm and increase inertia in the gas stream (steam) that carries them. These elements, passing through pipes and valves at a high speed, cause erosion in valves. Regular valves use seat technology that allows steam to erode the primary sealing surfaces and severely damage valves.

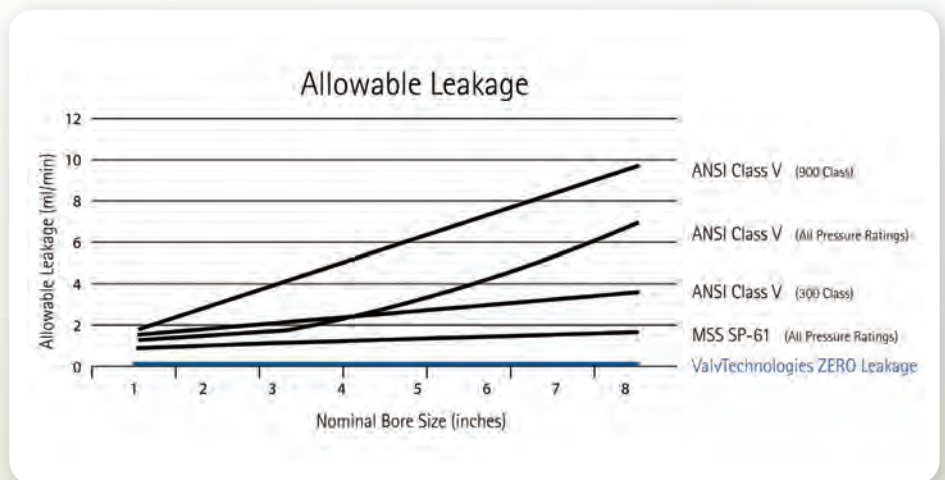


Figure 3: Allowable leakage.

CGIS is all about finding SOLUTIONS to the challenges our customers face on a daily basis.



Figure 4: Typical old technology used in TEOR.

Solution: Valvtechnologies' metal seated ball valves are made with carbide seating surfaces, mate-lapped together which can withstand erosion and corrosion. VTI's patented Ceramet and Rocket Applied Metallic (RAM®) hard coating is resistant from the attack of abrasive magnetite or ferrous oxides in the steam flow.

Challenge: Thermal Enhanced Oil Recovery (TEOR) is used to increase the amount of oil that can be extracted. Using this relatively new method of EOR, 30-60% of the reservoir's original oil can be extracted compared to 20-40% using primary and secondary recovery. An important factor in this entire process is to ensure that pressure within the pipes and valves does not drop below the minimum pressure point. Reduced pressure could result in loss of energy affecting productivity.

Solution: Valvtechnologies' complete range of V1 valves is built to withstand high pressure and temperatures with ZERO Leakage. VTI's V1-1, used primarily in high-energy applications in the TEOR & power industry, is available in sizes from ¼" to 4" and ANSI pressure classes from 900 to 4500 including interpolated and special ratings. The V1-4 high pressure large bore valves extend the core design to larger diameters from 4" to 36".

Challenge: Another problem facing conventional leaking steam valve line gates and globes is when the leaking system condenses in isolated pipe runs, and then freezes during winter, often rupturing pipes. This causes delays in production while repairs take place.

Solution: With Valvtechnologies' ZERO Leakage valves, there is no question of leaking systems in any season and therefore no ruptured pipes. Valvtechnologies' ZERO Leakage valves ensure that no matter the internal steam pressure or the external weather conditions, leakage remains at ZERO.

The Best Valve is the Correct Valve

Features of V1 Series

- RAM® hard coating with chrome carbide
- Integral seat mated lapped to ball
- Hard coating
- Blow-out proof stem
- Live-loaded packing
- Four Year ZERO Leakage Guarantee
- ZERO Emissions



Figure 5:
Valvtechnologies V1-1 valve.

Xactrol™ Product Group Features

- RAM® hard coated with chrome carbide
- Allows rotary modulating control
- Allows combinations of precise flow control with tight shutoff
- Specifically engineered characterized upstream seat
- Useable on applications where a multiple orifice valve is necessary
- Useable where high pressure drop flashing and cavitation problems exist and tight shutoff is required.

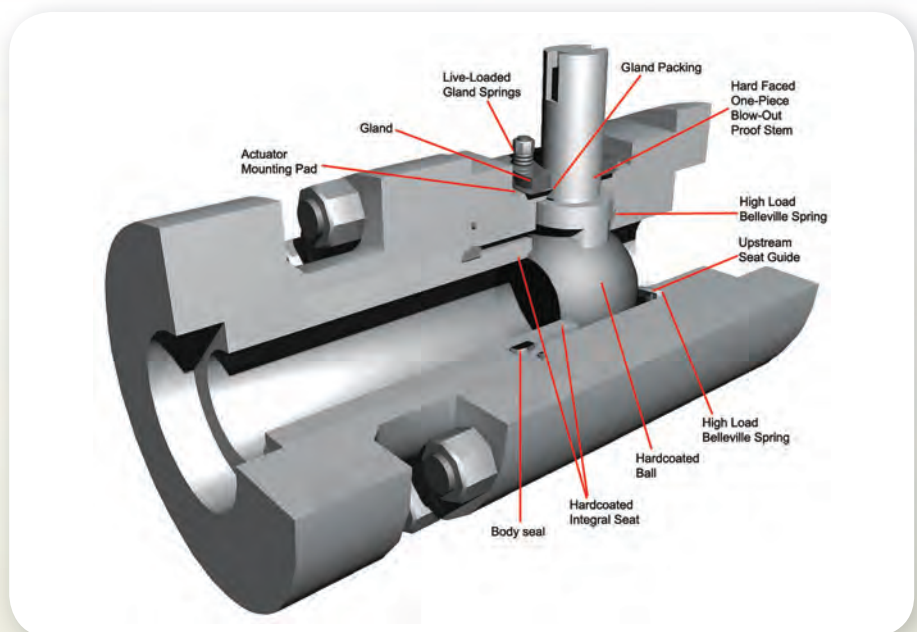


Figure 6:
V1-1 internal design.



Success Stories

Since 2004, CGIS has sold dozens of three inch Valvtechnologies' metal seated ball valves to a large oil company in Canada

The valves were used during the OTSG Blow Down process. To date, the valves are being used without failure.

In November 2001, a large oil company in Canada purchased thirty $\frac{3}{4}$ inch VTI ERV valves for OTSG. These valves are used at ANSI 1500 and are still being used today without any major repairs or delay to production.

The above are just two examples of how successful our valves have been in isolating steam.



We have sold thousands of valves to the power and oil industry with an exceptional success rate. Our track record proves that our valves are the most reliable in the business.

Benefits

Advantages of V1 Series

- Four Year ZERO Leakage Guarantee
- No body-to-seat-joints
- No leakage between a loose seat and the valve body
- Resistant to contact from abrasive magnetite or ferrous oxides in the steam flow
- Tight shut-off independent of high pressure, high temperature process conditions
- Reduced maintenance
- Lowest cost of ownership
- Highest reliability

Advantages of Xactrol™

- Four Year ZERO Leakage Guarantee
- Good rangeability from 15% to 100% of maximum flow
- Upstream sacrificial seat sized to maximum flow
- Applications include start up drains and vents where control is required & feed pump leak-off bypass valves & superheater bypass
- Sized upstream seat and cross holes in ball
- Applications include continuous blowdown valves
- Valve is available as a tandem with an upstream root isolation valve
- Combines Xactrol Mark I and II with pressure let down disc stacks
- Applications include boiler blow down, boiler feed pump leak-off (re-circulating bypass) superheater bypass systems and main steam vents
- Reduced maintenance
- Lowest cost of ownership
- Highest reliability

Our Locations

★ Offices



Our Guarantee

We stand behind our products

CGIS, on behalf of Valvtechnologies, provides a 4-Year absolute ZERO Leakage Guarantee on all of its ZERO Leakage valves.

All valves have a specific lifetime beyond which they need to be repaired or replaced. At the time of replacing the valve, CGIS will not only refurbish the valve for you (by relapping and adding new packing) so that it is essentially brand new, we will also sell it back to you at a fraction of the original cost. Post repair these valves have the capacity to work for an additional number of years equal to or exceeding the original duration. Repairs and refurbishment are carried out at our certified repair facility in Edmonton. We are equipped to handle repairs of any size.

Loss of production due to damaged or leaking valves raises costs and wastes manpower. By choosing the Valvtechnologies' superior metal seated ball valves specific to your application, you are ensured a lower cost of ownership and minimum valve maintenance.

No worries, no constant repairs and no loss of production.



The World's Best Valves

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