



# Severe Service Metal Seated Ball Valves Mining & Minerals and Slurry Transport

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### **EVS Mission Statement**

We at EVS will strive to understand difficult flow isolation or control applications faced by our customers and will work with them to provide a reliable valve solution using sound engineering practices and our extensive industry experience. EVS team members will attain customer satisfaction without compromising good business ethics and our core values.

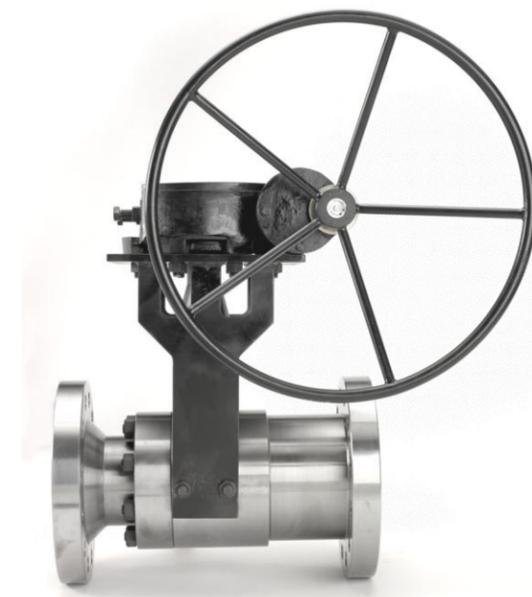
**Virgo Ball Valves | ViNtrol | RIFOX | TriTork**

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## Virgo Engineers

Virgo Engineers is one of world's fastest growing groups in the flow control industry. With customers in over 60 countries, manufacturing locations in four countries across three continents and over 900 employees worldwide, Virgo has emerged as a leading manufacturer of valves and steam equipment, serving diverse markets worldwide.



Virgo's rapid growth in global markets is a testimony of the company's steadfast commitment to "Customer First" policy, combined with its unflinching adherence to high ethical standards.

Virgo continues to focus on meeting or exceeding customer expectations in terms of product performance and on-time delivery.

## EVS Valve Division

EVS Valves designs and manufactures state-of-the-art technology Severe Service Metal Seated Ball Valves. EVS Valves is located in Stafford, Texas. The EVS Team with over 80 years combined experience is positioned to meet the harsh application requirements of the mining industry. EVS metal seated ball valves have been installed in applications where critical shutoff or isolation of flow must be achieved due to safety, environment, and maintenance concerns.

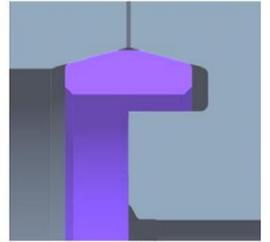
## Design Considerations for Mining, Minerals and Slurry Transport

Unlike other industries, slurry pipelines and mining & minerals present unique challenges to valve manufacturers. These include; mine location, size, shape and hardness of particulate in slurry, flow velocity, bi-directional seating; and valve performance in respect to seat leakage and valve operation. To meet these challenges EVS Valves incorporates the following design elements into our products.

- To minimize turbulence and erosion, valves are supplied with fill-ports and seats located outside the flow path.
- Tight shutoff and prevention of particulate matter from being trapped between surfaces is achieved by designing seating surfaces, which move across each other (wiping action) and the Ball rotating about its own axis.
- Reduced maintenance or down time is achieved by hardfacing the Ball. Purge Ports and Scraper Seats can be employed in the valve-body cavities to prevent particle buildup or adhesion.

### Metal Body Gasket

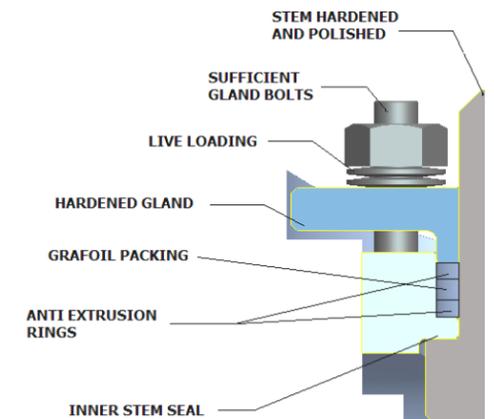
The body gasket is a self-energized and pressure-energized body gasket. As the body halves are bolted together, the gasket is contracted radially exerting a sealing force outward.



### Stem Packing

Stuffing box and "live loaded" spring washers ensure packing is continuously "energized". Side loads on the stem are eliminated as is packing deformation and packing leakage.

Our **Integral Seat Design** allows for easy control of ball to stem centerline. 4-Bolt Packing Gland provides easy access and maintenance.



### Other Features

#### Stem Adaptor

Misalignment and potential leakage are eliminated from stem being accidentally "knocked" into ball slot by contact proof design.

#### Blow-out Proof Stem

Large one-piece machined, hardened and polished stem is easily installed through body bore. Design eliminates need for pins.

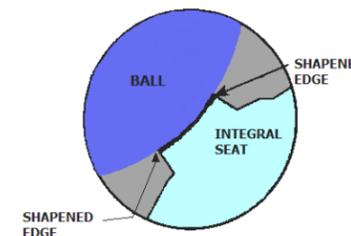
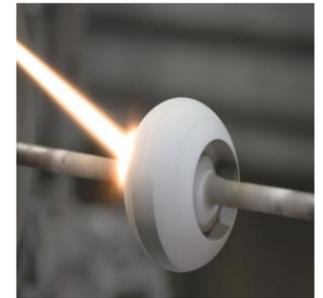
#### Integral Stop Plate

Critical alignment and over rotations maintained with integral 90 degree machined stem stop plate.

#### High-Tech Coatings – Ball & Seats

HVOF (High Velocity Oxygen Fueled) Chrome Carbide and Tungsten Carbide provide very high hardness values (70+ HRC with bond strengths of up to 25,000 psi). These coatings have extremely good wear and abrasion resistance.

Spray & Fused Coating, which utilizes a nickel or cobalt based powder are also available.



#### Scraper Seats and Purge Ports

These options increase valve life by removing media build-up in body cavity. Scraper seats and strategically placed purge ports increase valve life by removing media build-up from the body cavity.

## Product Overview

- Designs: Floating Ball and Trunnion
- Sizes: 2" to 36"
- ASME Class: 150 to 2500
- End Connections: RF Flanged, RTJ, Butt weld, Socket weld and Clamp Hubs
- Bore: Full and Reduced Bore
- Sealing: Unidirectional and Bi-directional
- Actuation: Lever, Gear, Electric, Pneumatic, and Hydraulic
- Codes and Standards: API 598, API 6D, API 608
- Testing/Inspection: API 598, API 6D, API 607, Ultrasonic, Radiographic, Magnetic Particle and Liquid Penetrant per ASME B16.34, and Leakage to FCI 70-2.

## Design Benefits / Features

*Durability and rigidity are key elements for any severe service valve. EVS Valves demonstrates by:*

- \* Years of proven service; supported by 4-Year Warranty
- \* Mass of Design; Large Body, Ball, and Spring, Body/End Adapter Gasket and Packing Chamber
- \* Side Mounting Operator Plate

### Large Spring Design

Provides sufficient seating force to prevent lifting due to thermal transients and dirty abrasive particles. Provides force for self-cleaning action. As the Ball rotates, the spring force will overcome the particle adhesion and the Seat will clean the Ball.

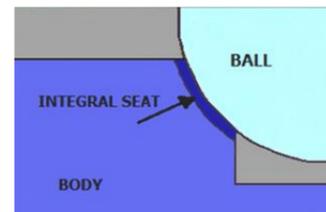
### Side Mounted ISO Bracket

Prevents "side-load" on stem and optimized "bolt stress loads" by attaching to the side of the body, versus the top of the body.

*Leakage, across seat and external to environment are critical components of valve performance. EVS Valves incorporates the following in its design.*

### Integral Seat

Design eliminates a potential leak-path, while the spring ensures the ball never leaves the mated seat as there is no floating of the seat or ball. The integral seat is rigid and there is no flexure under load.



The seat is not exposed to the process stream when fully opened or closed and there is no cavity behind the seat to become filled with particles.

## Slurry Transport Ball Valve Applications

### Pressure Letdown Choke Stations

Protection of pipeline against abrasion of pipe walls during slack flow and when the pipeline is operated in batch mode.

Choke Station ESD Valve	Instrument Isolation Valve
Instrument Bleed Valves	Drain Valves
Emergency Dump Valve	Choke Loop Cut Valve
Choke Loop Seat Valve	Bypass Isolation Valves
Main Slurry Line Isolation	

### Isolation Stations

Stations located at intervals to protect against pipeline rupture

Main Isolation Valve	Instrument Isolation Valve
Instrument Bleed Valve	Pigging Isolation
Drain Valve	Emergency Dump Valve
Pig Receiver Discharge Valve	Pig Launch Valve
Vent Valve	

### Pump Stations

Centrifugal Pumps (High Flow/Low Pressure) and Positive Displacement Pumps (Low Flow/High Pressure)

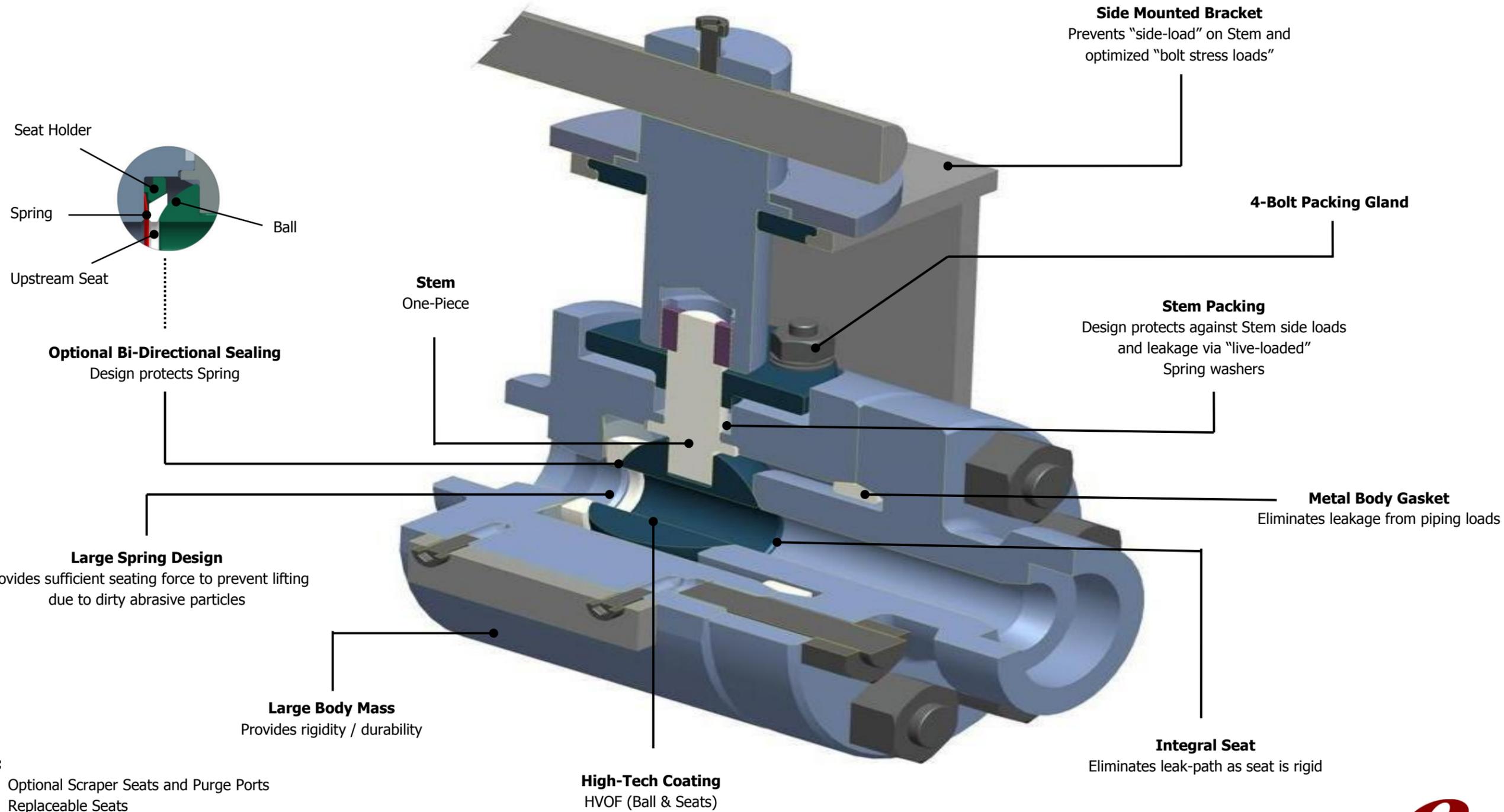
Charge Valve	Pump Isolation Valve
Drain Valve	Charge Pump Isolation

## Autoclave, Metals and Minerals

Extraction processes; HPAL (High Pressure Acid Leach), POX (Pressure Oxidation), SAGD (Steam Assisted Gravity Drainage), CSS (Cyclic Steam Stimulation), VAPEX (Vapor Extraction Process), CHOPS (Cold Heavy Oil Production with Sand) and Steam Flooding require unique valve design and internal trim coating processes to provide zero leakage in the presence of pressure, temperature, erosive and corrosive fluids.

## Metals and Minerals Applications

Mine Backfill	Oxygen Injection
Tailings Disposal	Autoclave Vent
Thickened Paste	Autoclave Vent Isolation
Thickener Underflow	Autoclave Discharge
Slurry Transfer	Autoclave Feed
Pneumatic Conveying	Sparge Valves
Fly Ash	Pump Isolation



**Other:**

- Optional Scraper Seats and Purge Ports
- Replaceable Seats
- Integral Stop Plate
- Replaceable Seat
- Stem Adaptor