METAL-SEATED BALL VALVES
For Severe Service and High-temperature
ASME 150–300, Sizes 4–24” (100–600 mm)
SB-150/300, SPLIT-BODY FULL PORT FLANGED METAL-SEATED BALL VALVES, 4–24” (100–600 mm)
ASME Classes 150, 300

Cover photograph shows a 14” (350 mm) Split-body Valve for iron pellets at 1,450°F (788°C).

DESIGN FEATURES:

- **Wall thickness** complies with ASME B16.34.
- **This unique, patented single-seat ball valve offers many advantages.**

  Most two-seated ball valve designs are loaded with Belleville washers or E-springs which can become clogged by solids, lose flexibility and prevent free ball expansion at high temperatures between 1,000–1,450°F (538–788°C).

  The Velan Single-seat Ball Valve has a flat spring set acting through a hardfaced bearing against the bottom ball shaft which provides sufficient initial ball-seat load for valve tightness, even at low $\Delta P$.

- **The Velan design** provides freedom for thermal expansion of the ball without jamming, even at extreme temperatures.

- **Proven in qualification tests and field operation** to be solids–proof, even for the toughest applications on slurry service with solids.

- **Tightness rates:** Allowable leakage rate at full $\Delta P$: ASME/FCI 70-2 Class V. With special lapping: tighter shutoff available upon request.

- **Maximum operating temperature:**
  - For CF8M valves: 1,450°F (788°C).
  - For WCB valves: 800°F (426°C).
  - For Chrome Moly C5 or C12: 1,000°F (538°C).

The Velan High-temperature Metal-seated Ball Valve is well suited for a variety of demanding services where high-temperature and abrasive solids are present.

**Typical applications can be found in:**

- PETROCHEMICAL
- OIL REFINING
- IRON ORE PROCESSING
- FILTER SKIDS
- SULPHUR REMOVAL

**BOTTOM TRUNNION DETAIL**

- Spring plate set
- Bearing
- Rest plate
- Trunnion shaft

Hydrocarbon vapors at 900°F (482°C).
This photo shows a 16” Class 150 split-body ball valve with gear box and actuator.
**SEAT DESIGN**

**SB-150, 300 Split-body**  
**Scraper seat 4–24” (100–600 mm)**

**Application:** Hot Gasses, Liquids, Solids and Slurries  
**Seat:** Gr. 316 (stainless), Hardfaced with Stellite 6  
**Backup seal:** Graphite to 1450°F (788°C)

The scraper seat design provides excellent ball cleaning capability in scaling, thermal cracking, polymerization and applications where the process tends to adhere to the ball surface.

**Low Torque Ball Design**

The optional ball construction incorporates the use of a reduced diameter ball where only the seating surfaces in both the closed and open position contact the seat.

The balance of the ball surface is below the seating surface allowing unobstructed ball travel when used in scaling, coking, polymerizing or other similar processes that will interfere with the smooth operation of a standard ball.

Also, the ball is available in the standard design with any one of the following hard coatings:

- STELLITE
- NICKEL BORON
- CHROME CARBIDE
- TUNGSTEN CARBIDE

**VALVES INSTALLATIONS**

12” Reactor discharge valve.

8” Hot caustic isolation valves at 345°F.
# HOW TO ORDER

## METAL-SEATED BALL VALVES

The figure numbers shown on this key are designed to cover essential features of High-temperature Metal-seated Ball Valves. Please use figure numbers to ensure prompt and accurate processing of your order. A detailed description must accompany any special orders.

<table>
<thead>
<tr>
<th>TYPE OF CONNECTION</th>
<th>SIZE OF CONNECTION*</th>
<th>MODEL NUMBER OR CLASS</th>
<th>PORT</th>
<th>TYPE</th>
<th>BODY MATERIAL</th>
<th>TRIM MATERIAL</th>
<th>SEAT/SEAL MATERIAL</th>
<th>SPECIAL SERVICE OR DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td>I</td>
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<td>4</td>
<td>1</td>
<td>3</td>
<td>S</td>
<td>7</td>
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</tbody>
</table>

**EXAMPLE:** Flanged, 4", Class 150, full port, Type L design, CF8M body, SS 316 CR plated ball, A 479 Gr. XM-19 stem, Stellite seat with Graphite Backup.

### A TYPE OF CONNECTION
- A – Special
- F – Flanged
- R – Flanged, ring joint

### B SIZE OF CONNECTION*

Customers have the choice of specifying valve size as part of the valve figure (“B”) using the numbers below, or indicating valve size separately.

- 12 – 4"
- 16 – 10"
- 20 – 16"
- 24 – 24"
- 14 – 6"
- 18 – 12"
- 21 – 18"
- 22 – 20"
- 99 – Special

### C BODY PRESSURE RATING**(1)

- 0 – 150
- 1 – 300

### D PORT

- 4 – Full port, one seat
- 5 – Full port, short pattern

### E TYPE

**Metal Seat:**
- L – Split-body, trunnion and leaf spring

### F BODY MATERIAL

- 01 – Special
- 02 – WCB
- 04 – Chr. moly, C5
- 05 – Chr. moly, WC6
- 09 – Chr. moly, C12
- 13 – Stainless steel, F316, CF8M
- 14 – Stainless steel, F316L, CF3M
- 28 – F317, CG8M
- 31 – LCC
- 32 – SS 316-Cr plated XM-19
- 33 – SS 316-Cr plated SS 630
- 0316 – SS 316-Ni plated XM-19
- 0316-L – SS 316-Ni plated SS 630

### G TRIM MATERIAL

<table>
<thead>
<tr>
<th>CODE</th>
<th>BALL</th>
<th>STEM</th>
<th>CODE</th>
<th>BALL</th>
<th>STEM</th>
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<td>SS 316-Ni plated</td>
<td>XM-19</td>
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</tbody>
</table>

### H SEAT MATERIAL

**Metal Seat:**
- 6– Stellite seat, PTFE seal
- 7– Stellite seat, graphite seal (standard)
- 9– Special

### I SPECIAL SERVICE OR DESIGN**(2)

- A – Standard (top-entry)
- H – Cryogenic
- I – NACE sour gas (standard split-body)
- L – Locked scraper seat
- M – Locked standard seat
- P – Powders
- S – Scraper seat
- T – Bonnet, double packing
- X – Special

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**NOTE:** The material in this catalog is for general information. For specific performance data and proper material selection, consult your Velan representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, Velan reserves the right to change designs, materials or specifications without notice.

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(1) Actual valve pressure/temperature ratings depend on choice of materials.
(2) If no special service or design is specified use “S”.
(3) Specify if solid Stellite, Stellite overlay or Stellite ring.