

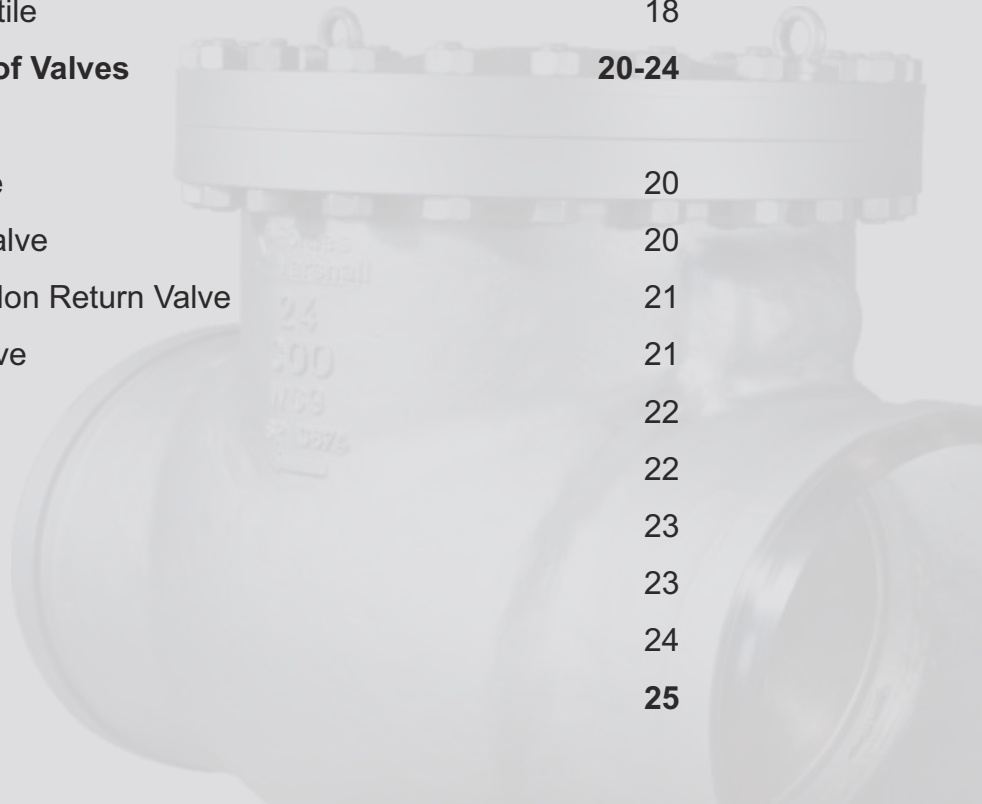
# Forbes Marshall Valves

High Performance Valves for Critical Applications



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## Introduction

Safety is of prime importance in any industrial process. Overpressure in the piping system, pressure vessels and boilers need to be avoided to prevent danger to human life and environment. Isolation and throttling valves play a major role in isolating the fluids, assisting in maintenance and keeping the plant safe.

Forbes Marshall manufactures a wide range of Gate, Globe, Check, Ball and Blowdown valves, as well as Safety relief valves. These valves are designed for best in class performance to optimise efficiencies and provide safety during equipment isolation and maintenance. They are suited for harsh environments, corrosive media and abrasive chemicals as well as very high pressure and temperature applications.

They have a proven performance in critical applications and varied fluid services of a wide range of industries including nuclear, thermal power, petroleum, metals, process and fertiliser plants.





## Fertiliser Industry

Fertiliser Plants predominantly use various types of ball, gate, globe and check valves. The material of construction for these valves include duplex stainless steel, stainless steel, SS304L, alloy 20 and certain exotic metals like hastelloy, inconel & incoloy for highly corrosive applications.

Forbes Marshall offers a range of special gate and globe valves, with extended bonnet / gland, suited for low-temperature liquid ammonia applications, nitric and sulphuric acids. Our wide range of valves are also suitable for applications in feed water, compressed air, boiler house and utilities.

## Range of Valves

Manual & Actuator Operated



## Fluid - Service Forbes Marshall Valve Features

## Material Offered



Liquid Ammonia

- Extended bonnet / gland being at -33 °C temperature
- Deep stuffing box with optional lantern ring
- PTFE packings / seals
- Soft seating (optional)
- Blowout proof stem in ball

- Stainless steel
- Alloy 20
- Low temperature carbon steel



Sulphur

- PTFE seal and packings
- Zero leakage
- Fire safe design
- Deep stuffing box with optional lantern ring
- Blowout proof stem in ball

- Inconel
- Incoloy
- Stainless steel



Process Water / Cooling Water

- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full Lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



Saturated & Superheated Steam

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



Compressed Air, N<sub>2</sub>

- Soft seated, tight shut-off
- Pressure energised seat ring with spring assistance.
- Anti-blowout stem construction
- Zero leakage

- Carbon steel
- Stainless steel



## Chemical Industry

The chemical industry handles a variety of viscous and corrosive fluids, and predominantly uses ball valves of special MOCs like alloy 20, hastelloy and inconel for isolation purposes. The Forbes Marshall range of ball valves are ideally suited for reactive and corrosive chemical feeds and solvents. Our range of valves are also suitable for applications in feed water, compressed air, boiler house and utilities.

### Range of Valves

Manual & Actuator Operated



Swing Check Valves



Blowdown Valves



Globe Valves



Ball Valves



Gate Valves



Safety Valves

## Fluid - Service Forbes Marshall Valve Features

## Material Offered



Black Liquor

- Self cleaning seat ring arrangement
- Deep stuffing box with optional lantern ring
- Metal to metal seating
- Hardfacing of stellite 6, Tungsten Carbide, Chromium Carbide Coating
- Blowout proof stem in ball

- Stainless steel
- Hastelloy



Saturated & Superheated Steam

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide, chromium carbide coating balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



Diesel/LDO

- Special sealing materials
- Tight shut off
- Fire safe design
- Safety valves with bellows

- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



Thermic Fluid

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Stainless steel



Compressed Air, N<sub>2</sub>

- Soft seated, tight shut-off
- Pressure energised seat ring with spring assistance
- Anti-blowout stem construction
- Zero leakage

- Carbon steel
- Stainless steel



## Infrastructure Industry

The infrastructure Industry includes industries like cement, building construction as well as water treatment and desalination plants.

Forbes Marshall tight shut off or metal-to-metal seated isolation valves are ideal for applications dealing with slurries, pure water, untreated water and sea water. We also offer a range of valves for other utility applications such as compressed air and gases.

## Range of Valves

Manual & Actuator Operated



Swing Check Valves



Blowdown Valves



Globe Valves



Ball Valves



Gate Valves



Safety Valves

## Fluid - Service Forbes Marshall Valve Features

## Material Offered



Ash Slurry/  
Mining Water

- Self cleaning seat ring arrangement
- Deep stuffing box with optional lantern ring
- PTFE packings / seals
- Metal to metal, soft seated
- Hardfacing of stellite
- Stellite, tungsten carbide or chromium carbide coated balls
- Blowout proof stem in ball

- Carbon steel
- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



Sea water / Salt water

- PTFE seal and packings
- Zero leakage
- Stellite, tungsten carbide or chromium carbide coated balls
- Blowout proof stem in ball

- Aluminium bronze
- Duplex stainless steel
- Super duplex stainless steel
- Stainless steel



Compressed Air, N<sub>2</sub>

- Soft seated, tight shut-off
- Zero leakage
- Pressure energised seat ring with spring assistance
- Anti-blowout stem construction

- Carbon steel
- Stainless steel



Process Water /  
Cooling Water

- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



## Nuclear & Atomic Industry

Forbes Marshall valves are specially designed to cater to nuclear applications, mainly heavy water, compressed air, carbon dioxide, helium gas and contaminated water.

These valves meet stringent seismic requirements and undergo relevant tests like seismic analysis, static load test, shake table test, LOCA test, helium leak test and cold and hot test .

We have a large installed base for main steam isolation valves and swing check valves in various circuits with non-slam dashpot arrangement, as well as others from our range for a wide variety of applications.

### Range of Valves

Manual & Actuator Operated



### Fluid - Service

### Forbes Marshall Valve Features

### Material Offered



Heavy Water

- Zero leakage in metal to metal
- Stringent NDT requirements - RT, UT, DP, LP tests
- PEEK seating
- Full bore design
- Meeting seismic requirement
- Safety valves with bellows

- Stainless steel



Process Water / Cooling Water

- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



Oxygen Gas

- PTFE seal and packings
- Eletropolishing on ball and seat ring
- Degreasing
- Clean room - O<sub>2</sub> cleaning
- Soft seating on wedge and plug
- Zero leakage

- Stainless steel
- Monel 400
- Monel 500



CO<sub>2</sub>, N<sub>2</sub>, Helium Gas

- Deep stuffing box with optional lantern ring
- Zero leakage
- Blowout proof stem in ball
- Fire safe design
- PTFE seal and packings
- Safety valves with bellows

- Stainless steel
- Monel
- Alloy 20



Saturated & Superheated Steam

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



## Thermal Power Industry

Power plants use valves for isolation and control in pollution control, feed water, cooling water, chemical treatment, bottom ash and steam turbine control, steam and turbine bypass, boiler house and many other application areas.

Forbes Marshall ball valves for soot blowing lines, MAL/angle drain single and multistage valves, main steam stop valves and startup vent valves for turbines and QCNRVs for steam turbine extraction lines have a proven performance across power plants.

## Range of Valves

Manual & Actuator Operated



## Fluid - Service Forbes Marshall Valve Features

## Material Offered



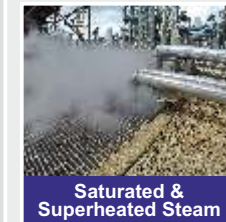
- Self cleaning seat ring arrangement
- Deep stuffing box with optional lantern ring
- PTFE packings / seals
- Metal to metal, soft seated
- Hardfacing of stellite
- Stellite, tungsten carbide or chromium carbide coated balls
- Blowout proof stem in ball

- Carbon steel
- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



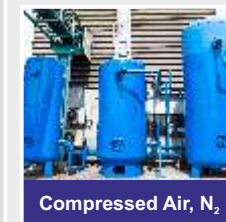
- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



- Soft seated, tight shut-off
- Zero leakage
- Pressure energised seat ring with spring assistance
- Anti-blowout stem construction.

- Carbon steel
- Stainless steel





## Metal & Mining Industry

Forbes Marshall offers a wide range of valves for the metal and mining industry.

Isolation valves are widely used in applications such as blast furnace gas or coke oven gas, corex gas, oxygen, steam, nitrogen, hydrogen and acids for pickling plants, cooling water, steam, and hot water in ferrous and non-ferrous metal plants.

These valves protect the equipment and machinery and contribute majorly to plant safety. For mining slurry applications special metal to metal seated ball valves are offered.

### Range of Valves

Manual & Actuator Operated



Swing Check Valves



Blowdown Valves



Globe Valves



Ball Valves



Gate Valves



Safety Valves

### Fluid - Service

### Forbes Marshall Valve Features

### Material Offered



Ash Slurry/  
Mining Water

- Self cleaning seat ring arrangement
- Deep stuffing box with optional lantern ring
- PTFE packings / seals
- Metal to metal, soft seated
- Stellite, tungsten carbide or chromium carbide coated balls
- Blowout proof stem in ball

- Carbon steel
- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



Process Water /  
Cooling Water

- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



Compressed Air, N<sub>2</sub>

- Soft seated, tight shut-off
- Zero leakage
- Pressure energised seat ring with spring assistance
- Anti-blowout stem construction

- Carbon steel
- Stainless steel



Helium / Co<sub>2</sub> Gas

- Deep stuffing box with optional lantern ring
- Zero leakage
- Blowout proof stem in ball
- Fire safe design
- PTFE seal and packings
- Fugitive emission testing
- Safety valves with bellows

- Stainless steel
- Monel
- Alloy 20



O<sub>2</sub> Gas

- PTFE seal and packings
- Eletropolishing on ball and seat ring
- Degreasing
- Clean room - O<sub>2</sub> cleaning
- Soft seating on wedge and plug
- Zero leakage

- Stainless steel
- Monel 400
- Monel 500



## Oil & Gas Industry

Thousands of valves are found across refineries and petroleum plants, from distribution pipelines to gas applications, from tank farms to loading applications and from shipping vessels to compressor and pumping units.

Forbes Marshall offers angle globe valves for cooling water systems, tandem configuration globe valves for vent and drain, safety relief valves for vessels and compressors, and blow down valves for boiler applications and many other utilities.

### Range of Valves

Manual & Actuator Operated



### Fluid - Service

### Forbes Marshall Valve Features

### Material Offered



Process Water / Cooling Water

- Hardfacing of stellite 6 / colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



Saturated & Superheated Steam

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



Diesel / LDO

- Special sealing materials
- Tight shut off
- Fire safe design
- Safety valves with bellows

- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



Hydrogen / Naptha

- Deep stuffing box with optional lantern ring
- Zero leakage
- Blow out proof stem in ball
- Fire safe design
- PTFE seal and packings
- Fugitive emission testing
- Safety valves with bellows

- Stainless steel
- Monel



Gas, Sweet gas

- Deep stuffing box to arrest leakage path
- Special sealing material
- Tight shut off
- Fire safe design
- Blowout proof stem in ball

- Stainless steel
- Monel



## Rubber/ Paper / Textile Industry

All small and medium process industries like rubber, paper, textile, food, plastics, leather, etc., use steam and thermic fluid as the primary heating medium. These industries use all types of valves - namely safety valves, blowdown valves, check valves, globe valves, ball valves and gate valves in the heating and cooling circuits for low and high-pressure applications. The Forbes Marshall range of valves cater to every isolation requirement in these industries.

### Range of Valves

Manual & Actuator Operated



Swing Check Valves



Blowdown Valves



Globe Valves



Ball Valves



Gate Valves



Safety Valves

### Fluid - Service

### Forbes Marshall Valve Features

### Material Offered



Black Liquor

- Self cleaning seat ring arrangement
- Deep stuffing box with optional lantern ring
- Metal to metal
- Hardfacing of stellite 6, tungsten carbide, chromium carbide coating
- Blowout proof stem in ball

- Stainless steel
- Hastelloy



Process Water / Cooling Water

- Hardfacing of stellite 6 /colomony
- Corrosion free stainless steel internals
- Full lift, full nozzle safety valves
- Graphite packing

- Carbon steel
- Stainless steel



Saturated & Superheated Steam

- Hard facing of stellite 6
- Pressure equalising valves on high pressure lines
- Parallel slide design in gate valves for repeatable tight shut-off
- Live loaded stuffing box
- Stellite, tungsten carbide or chromium carbide coated balls
- Non-slam feature in check valve

- Carbon steel
- Alloy steel
- Stainless steel



Diesel / LDO

- Special sealing materials
- Tight shut off
- Fire safe design
- Safety valves with bellows

- Stainless steel
- Duplex stainless steel
- Super duplex stainless steel



Compressed Air, N<sub>2</sub>

- Soft seated, tight shut-off
- Zero leakage
- Pressure energised seat ring with spring assistance
- Anti-blowout stem construction

- Carbon steel
- Stainless steel

## Non Return Valves



**Lift Check Valves**

Lift check valve is a spring-loaded valve with a plug or ball type control element to arrest reverse flow.

- Conical seat for positive sealing
- Optimum spring design ensures low cracking pressure and quick closing
- Suitable for both horizontal and vertical installation
- Energy efficient due to low cracking pressure

### Size and Rating

1/2" to 2" NPS - # 800
1/2" to 2" NPS - # 1500
1/2" to 2" NPS - # 2500

### Conformance to

- ASME B16.34
- ASME SEC III NB, NC, ND
- ISO 15761



**Quick Closing Non Return Valves (QCNRV)**

The QCNRV prevents reversal of flow and provide a quick positive shut off, thus limiting damage to the source equipment in the event of a trip.

- Closing in less than a second
- Reliable reverse flow prevention
- Side mounted compact pneumatic spring return actuator
- Protects sophisticated systems and equipment from damage
- Reduced pressure loss

### Size and Rating

2" to 24"NPS - 150#
2" to 24"NPS - 300#
2" to 24"NPS - 600#

### Conformance to

- ASME B16.34
- BS1868
- ASME SEC III NB, NC, ND



**Swing Check Valves**

In a swing check valve, the disk swings away from the valve seat to allow flow in the forward direction, and returns to the valve-seat when an upstream flow is stopped, to prevent backflow.

- Testable / tilting disc design, full bore piggable
- Fully confined pressure boundaries
- Hinge position ensures positive closing even at low pressure/flow
- Optional dashpot arrangement for non-slamming operation
- Suitable for both horizontal and vertical installation

### Size and Rating

2" to 30"NPS - 150#	2" to 24"NPS - 300#
2" to 24"NPS - 600#	2" to 18"NPS - 900#
2" to 16"NPS - 1500#	2" to 12"NPS - 2500#

### Conformance to

- ASME B16.34
- API6D, BS1868
- ASME SEC III NB, NC, ND



**Stop Check Valves**

Stop Check valve is a variable opening type non-return valve with the additional function of isolation.

- Ideal globe body design for Isolation
- Variable opening for variable discharge
- Non-rotating disc prevents seat damage

### Sizing and Rating

1/2"to 2"NPS -800#
1/2"to 2"NPS -1500#
1/2"to 2"NPS -2500#

### Conformance to

- ASME B16.34

## Globe Valves



Globe valves are ideal for applications that require shut-off/throttling and frequent operations

- Parabolic plug design
- Pneumatic or electric actuator options available.
- Guided plug for higher sizes and higher pressure rating
- Pressure balancing plug to reduce operating thrust and torque
- Tight shut-off

### Size and Rating

2" to 20"NPS - 150#	2" to 12"NPS - 900#
2" to 16"NPS - 300#	2" to 10"NPS - 1500#
2" to 12"NPS - 600#	2" to 10"NPS - 2500#

### Conformance to

- ASME B16.34
- BS1873 ASME SEC III NB, NC, ND

## Ball valves



Ball valves are offered in 2 piece or 3 piece design and floating or trunnion mounted for tight shut off Isolation.

- Double block and bleed at upstream and downstream
- Metal to metal seat design for high temperature and corrosion resistance
- Spring-loaded metal seat with soft seat insert
- Tight shut off at low pressure
- Built in cavity pressure safeguard

### Size and Rating

2" to 24"NPS - 150#	2" to 24"NPS - 900#
2" to 24"NPS - 300#	2" to 20"NPS - 1500#
2" to 24"NPS - 600#	2" to 16"NPS - 2500#

### Conformance to

- ASME B16.34
- API6D
- ISO 17292

## Gate Valves



Gate valves are bi-directional valves for isolation services.

- Pneumatic or electric actuator options available
- Compliance to latest fugitive emission norms
- Split wedge, parallel slide or double disc design
- Spring energised closing in the parallel slide design
- Tight shut off with minimum pressure loss

### Size and Rating

2" to 42"NPS - 150#	2" to 10"NPS - 900#
2" to 30"NPS - 300#	2" to 18"NPS - 1500#
2" to 24"NPS - 600#	2" to 16"NPS - 2500#

### Conformance to

- ASME B16.34
- API6D, API600
- BS 1414, ISO 10434
- ASME SEC III NB, NC, ND

## Safety Relief Valves



Safety relief valves are available in different sizes and ratings for all fluids-steam, gases and liquids

- Full nozzle, full lift design
- Special alloy steel spring and internals
- Ring seals for bubble type shut-off on gas applications
- Available with flanged and butt weld connections
- Self compensating thermal design for reliable operation at varying temperatures

### Size and Rating

1"x2"NPS upto 8" X10" NPS - 150# TO 300#
1"x2"NPS upto 6" X8" NPS - 600# TO 1500#

### Conformance to

- API 526
- ASME Sec VIII Div.1
- API 520

## Blow Down Valves



Blowdown valves are used for continuous and intermittent blowdown in the boiler drum. They are available in single stage and multistage design.

- Pneumatic or electric actuator options available
- Multistage designed for pressure drop as high as 200 bar
- Anti cavitations design for drain application
- Special slotted and parabolic plug design

### Size and Rating

1/2" to 3" NPS 150# to 2500#

### Conformance to

- ASME B16.34

## High Performance Valves for Critical Applications

Safety is synonymous with the valves that are manufactured by Forbes Marshall. Our installed base in Industry stands testimony to this.

Total Valves

1,00,000+

Gate Valves

40,000+

Globe Valves

25,500+

Ball Valves

20,000+

Check Valves

10,000+

Customised Valves

5,000+



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