

# Proven reliability for each process stage

Flow control solutions  
for the steel industry





# Flow control solutions for the steel industry

Valmet's valve solutions for the steel industry cover every stage of steel production, from iron making to steel making, continuous casting and rolling, as well as power plant and oxygen plant. Whatever your application, our products deliver proven, reliable technology and lasting, cost-effective performance.



# Typical valve applications

At every step of the steel making process, you need safe and reliable valves to handle industrial gasses, steam, water, lime and other process media. We've built a portfolio of products and services based on our customer's needs, ranging from standard to demanding steel mill applications.



## + Coke gas

When coke is produced for use in blast furnaces, coke gas forms as a by-product. This consists of 50-60% hydrogen, 15-50% methane and small amounts of other components. With a high calorific value of 5 kWh/Nm<sup>3</sup>, coke gas is a high-value fuel for power generation. When selecting the valves for coke gas service, one of the key considerations is whether there are particles in the media. If the gas is not clean, metal seated valves will outperform soft seats and should be considered to ensure sufficient lifetime and performance.



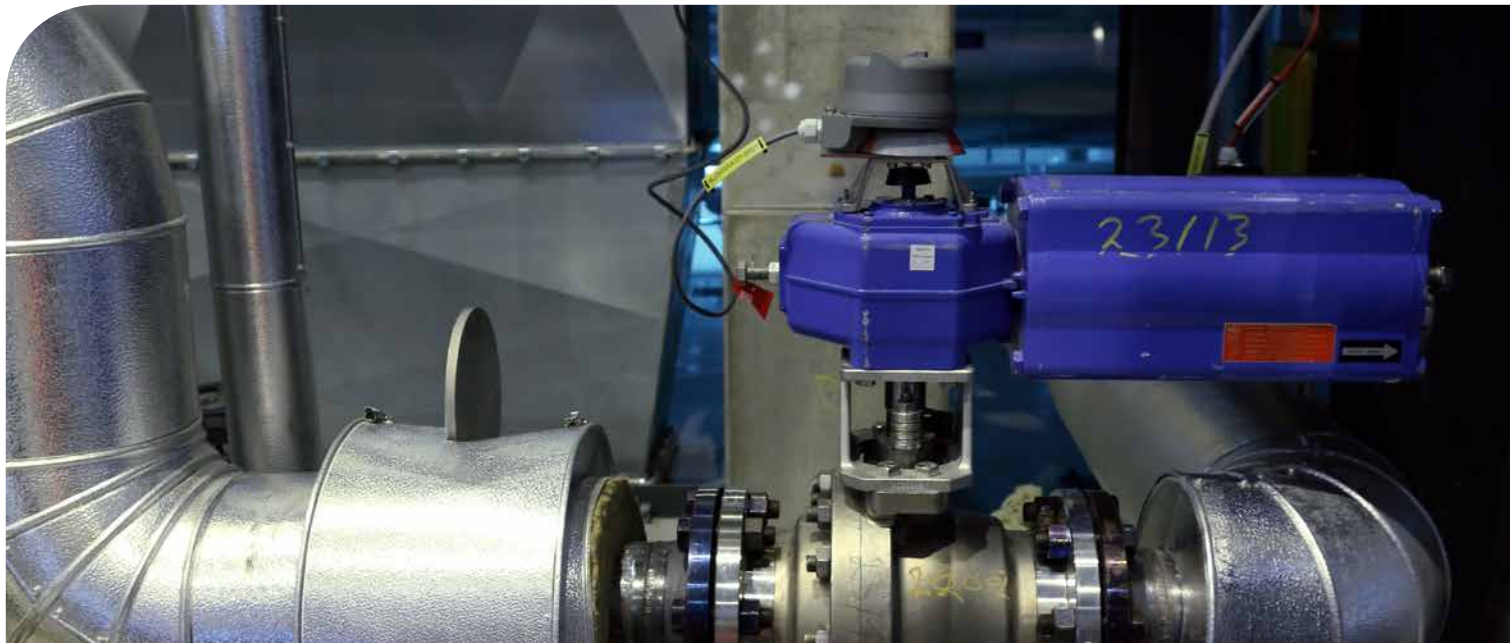
## + Blast furnace gas

Blast furnace gas is generated when iron ore is reduced with coke to metallic iron. The typical composition by volume is about 60% nitrogen, 20% carbon monoxide and 20% carbon dioxide. Blast furnace gas is typically used for electricity and steam generation even though it has a low heating value. One of the most important considerations when selecting valves for blast furnace gas is to understand that it can adhere firmly and can form unwanted deposits.



## + Converter gas

Converter gas is created as a by-product gas in the steel making process. It consists of about 65% carbon monoxide, 15% carbon dioxide, 15% nitrogen and small amounts of other gases. The gas has a lower heating value of about 3 kWh/Nm<sup>3</sup> and is typically utilized as a source of energy. As converter gas applications are typically non-demanding, valve selection is straight-forward with soft-seat materials and standard constructions being recommended. If there are particles present in the media, metal seated valves will give you a very long service life with a low Total Cost of Ownership.



## Other featured valve applications

### + Nitrogen

Nitrogen is a widely used gas in steel mills. For example, it is used to convey combustible materials pneumatically, to dry quench hot coke, to cool blast furnace components like the gear box and for heat-treating steels in the nitriding process. Nitrogen is an inert gas, so valves in this service do not typically need any special treatments, such as cleaning. When you're looking for an economical solution with top performance for nitrogen on-off service, Neles™ and Jamesbury™ ball valves with Xtreme™ soft seating technology are a reliable choice.

### + Process air, such as blowout and combustion air

Process air is typically a simple service and Neles standard valve offering includes a selection of fit-for-purpose valves. For air service valve installations which operate in a particularly high temperature range, for example in the combustion system of a reheating furnace, more specialized valve construction is required. We have developed robust valve components to withstand these temperatures, including cobalt-based alloys for bearings and graphite for gaskets.

### + Water service, such as descaling and cooling applications

Water is used for several services across various process areas in steel mills. For example, blast furnace cooling is a common application, and in the hot rolling mill, water is used to descale the strip surface and remove mill scale. For wide rangeability and precise control, Neles R-series segment valves are a top choice.

### + Lime slurry

Lime is used in various ways in the steel making process. Milk of lime or lime slurry is particularly challenging because the lime does not dissolve but rather stays suspended in solution. The suspended lime particles attach to cracks and cavities in valves, forming scale. Scale buildup is a major risk that can stop valves working properly, leading to production stops and unnecessary maintenance. We have successfully helped steel industry customers to overcome the challenges of handling lime, and ceramic valves are one of the solutions we offer for long and maintenance-free operation.

### + Acidous waters, HF and HNO<sub>3</sub> acids with metal oxides, pickling sediments, re-circulated waters

The steel is annealed to soften and to homogenize its internal structure by heat treatment and pickled to clean the surface. Pickling is carried out in an electrolytically neutral Na<sub>2</sub>SO<sub>4</sub>-solution followed by mixed acid (HNO<sub>3</sub>+HF) pickling which ensures the cleanliness of strip and impacts the correct stainless steel lustre. The strips are flushed with the water to remove the remaining acids and solids. These process waters are then typically lead to acid recovery, dregs handling and water neutralization. To prevent leaking and jamming problems for installed valves into these processes, Flowrox PVE pinch valve series are the preferred choice.

# Valve solutions for power and oxygen production

We are proud to offer an extensive range of products and solutions for power and oxygen production plants at steel mills. For power plant valve needs, we will meet and exceed your expectations regardless of the technology you use for producing power. Oxygen service is also one of our strong suits. In fact, we have supplied thousands of valves for oxygen applications.

## Safe and reliable operation for power applications

Steel plants require a stable and reliable source of power, and almost all steel plants recover and reuse by-product gasses for power production on-site. This also helps them lower their energy costs and emissions. We have wide experience in power applications and we have been supplying valve solutions for gas and steam turbines and compressors for decades. We have a comprehensive selection of valves for power plants, including valves for coke oven gas compression and blast furnace top pressure recovery turbines.



## Reliable control and isolation for oxygen applications

Whether your valves are installed in oxygen generation plants (e.g. Air separation and Vacuum Swing Adsorption units) or throughout the oxygen network, we have the experience and expertise to design and maintain these specific valves. We comply with the latest oxygen standards and apply recognized oxygen cleaning procedures during valve production and maintenance. Our products for gaseous and liquid oxygen have been developed and approved in cooperation with the major industrial gas players who demand safety, reliability and low total cost of ownership.

## Pinch valves in ferrochrome duty for over 15 years

Ferrochrome is used as raw material in stainless steel industry. In ferrochrome process (smelting) CO gas is produced as a by-product, which then can be utilized in sintering, preheating and in downstream processes such as hot-rolling and cold-rolling. These CO gas pipelines need reliable and safe isolation valves, especially when part of the CO gas line needs to be closed. Together with ferrochrome plant engineers we designed special sealed pinch valve and actuator with pneumatic / mechanical spring closing system. This solution has provided for over 15 years reliable valve operation and 100 % safe valve shut off.





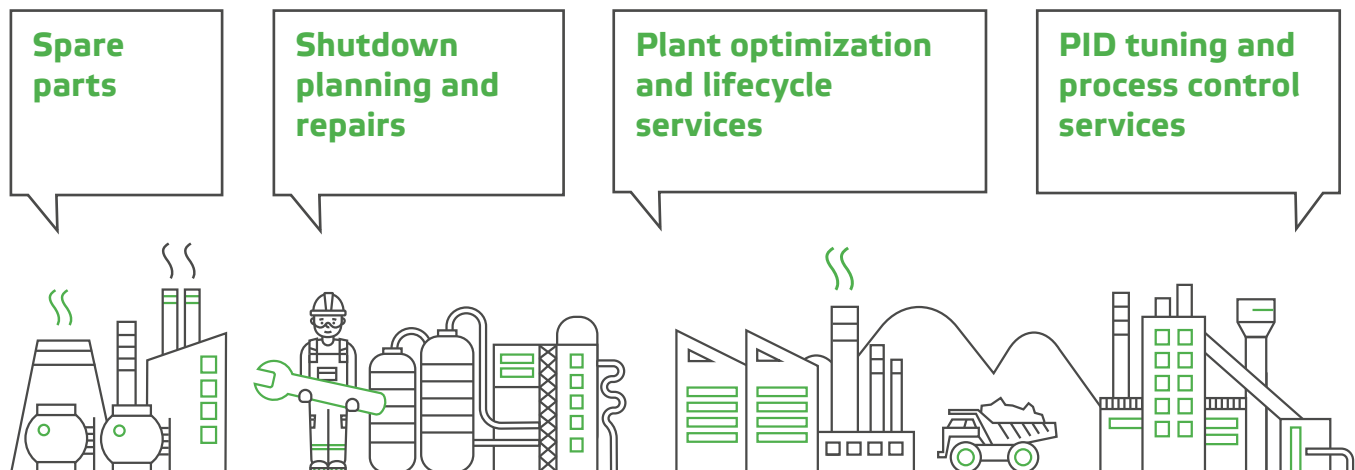
# Valmet services help you meet availability and performance targets

Steel mills, like any large-scale industrial complex, face a wide range of challenges. Imagine a typical day: targets are met until one of your valves starts performing poorly, impacting production. Your maintenance department takes immediate action to repair the device and resume production as quickly as possible.

Valmet services help customers across the globe prevent such valve issues, increase availability, reduce risk and improve plant performance.

Our digital tools give you a complete view of how your process and valves are performing by monitoring condition and pinpointing underperformance before it causes downtime.

We also support you in determining when and how to maintain valves, selecting spare parts, planning shutdowns and seizing opportunities to improve valve and process performance.




## Your reliability partner

Our global service network and process know-how are the result of over 60 years of working closely with the process industry – including steel mills, oxygen plants and power plants. Flow control expert services and digital tools help keep your process running safely and profitably while minimizing downtime. Our best practices and spare parts also maximize the lifespan and performance of your valves.



# Valves portfolio for steel industry

Featured valve products typically used in steel applications. To explore all of our comprehensive portfolio suited for your process needs, please visit [valmet.com/flowcontrol](http://valmet.com/flowcontrol)

## Neles segment valves: High control performance and wide rangeability

Neles segment valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Neles segment valves</b> 	R-series Cv-element Q-elements (noise)	Pre-engineered segment types and materials acc to industry mediums. Control and on/off applications	<b>Size:</b> DN25 – 800 <b>ASME</b> 1" – 36" <b>Pressure:</b> DIN, ASME, JIS-ratings <b>Seat:</b> Metal and soft seated		Benchmark control performance for steel mills. Provides constant gain over wide control range	RA: 3R21 RE: 3R24

## Neles ball valves: Flanged ball valves optimized for demanding applications



Neles ball valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Neles ball valves</b> 	X-series Q-elements (noise)	Seat supported modular ball valve. Valve modularity widens the options in material selections to meet appl requirements	<b>Size:</b> DN25 – 200 in full bore DN80 – 200 in reduced bore For larger sizes see bulletin		Steel mills on/off and control service. Widely used valve in steel mills	1X26
<b>Neles ball valves</b> 	E-series	A new generation ceramics, Mg-PSZ, lines the series E flow path	<b>Material:</b> Neles™ WearBlock™ materials available for the toughest applications		Demanding applications such as lime slurry handling	1E220

Standards and certifications








## Jamesbury ball valves: Flanged ball valves for high flow capacity and reliability

Jamesbury ball valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Jamesbury ball valves</b> 	7000-series standard port	Pre-engineered valve types and materials according to industry standards for control, on/off and manual use	<b>Size:</b>	DN15 – 500 (½" – 20") ASME Class 150 & 300	Applications up to 260 °C / 500 °F High performance Xtreme seat materials Low emission stem seals	B107-1 B107-3
	9000-series full port		<b>Body:</b>	Carbon steel, 316SS, Alloy 20, Monel, Hastelloy C		
<b>Jamesbury ball valves</b> 	4000-series	Pre-engineered valve types and materials according to industry standards for control, on/off and manual use	<b>Size:</b>	Standard port: DN15 – 65 (½" – 2½") Full port: DN15 – 50 (½" – 2")	Applications up to 260 °C / 500 °F High performance Xtreme seat materials Low emission stem seals	B105-1
			<b>Body:</b>	Carbon steel, 316SS, Monel, Hastelloy C		
<b>Ball/stem:</b>	Carbon steel, 316SS, Monel, Hastelloy C					


## Pinch valves: Heavy duty pinch valves for demanding slurry applications

Flowrox pinch valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Flowrox pinch valves</b> 	PVE-series Enclosed body	The enclosed body valve is the most common body type for Flowrox pinch valves. Its enclosed design prevents premature sleeve deterioration and protects the sleeve from the environment, making it extremely safe to operate.	<b>Size:</b>	DN 25 – 600 ASME 1" – 24"	Flowrox pinch valves for shut off and control applications involving abrasive or corrosive slurries, powders or granular substances. The rubber sleeve is the only wearing part.	4PV20EN
<b>Flowrox pinch valves</b> 	PVG-series	Flowrox PVG is a robust pinch valve with strong metal body, single-sided simple closing mechanism. Through its reliability and structure, offers substantial savings based on improved performance.	<b>Pressure:</b>	0 – 100 bar Bigger sizes upon request		
			<b>Pressure range:</b>	0 – 10 bar Bigger sizes upon request		
			<b>Size:</b>	DN 50 – 250 ASME 2" – 10"	Designed for shut off applications involving pressure resistance, heat, abrasion, corrosion and aggressive slurries.	4PV20EN
			<b>Pressure:</b>	0 – 10 bar Bigger sizes upon request		
			<b>Pressure range:</b>	0 – 10 bar Bigger sizes upon request		


## Neles knifegate valves: Rugged design for tough slurry applications

Neles butterfly valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Neles butterfly valves</b> 	L-series S-discs (noise)	Pre-engineered valve types and materials according to industry standards. Low lifecycle costs	<b>Size:</b>	DN25 – 600 ASME 1" – 36"	Economical performance for control and shutoff service in minerals processing plants	L12: 2L121 LW: 2LW20
			<b>Pressure:</b>	EN, ASME, JIS-ratings		
			<b>Seat:</b>	Metal and soft seated		


## Jamesbury butterfly valves: High-performance valve in wafer or single-flanged lugged designs

Jamesbury butterfly valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Jamesbury butterfly valves</b> 	800-series	Pre-engineered valve types and materials according to industry standards for control, on/off and manual use	<b>Size:</b>	ASME Class 150 & 300 Wafer: DN65 – 750 (2½" – 30")	Economical performance for control and shut-off service in all soft seated applications	W101-6 W104-1 W105-1
			<b>Lugged:</b>	DN65 – 1500 (2½" – 60")		
			<b>Body/trim:</b>	Carbon steel, 316SS, Alloy 20, 254SMO®, Monel, Hastelloy C		
			<b>Seat:</b>	Teflon®, Xtreme, UHMV, 316SS/PTFE, 316SS/XT		


## Neles™ Easyflow™: Concentric disc resilient seated butterfly valves

Neles Easyflow						
Product	Series	Design	Specifications		Service	Bulletin
<b>Neles Easyflow</b> 	JA-series	Although compact and lightweight, the JA-series is designed to be rugged, reliable, and to comply with a variety of industry standards	<b>Size:</b>	DN50 – 600	Water and slurry applications, all nondemanding applications in steel mills	W152-1
			<b>Pressure:</b>	PN10, PN16, Class 150 pressure ratings		


## Neles globe valves: Rugged globe, balanced cage guided type

Neles globe valves						
Product	Series	Design	Specifications		Service	Bulletin
<b>Neles globe valves</b> 	G-series Tendril & Omega trims (Noise & cavitation)	Compact and lightweight construction Large range of trims with various Cv and characteristics to fit process conditions	<b>Size:</b>	DN15 – 600 (½" – 24")	High capacity and heavyduty globe for various control valve duties	GU: 4GV21 GB: 4GV25 GM: 4GV20
			<b>Pressure:</b>	ASME 150 – 2500 / PN 10 – 320 JIS 10K – 20K ratings		


## Jamesbury™ Quadra-Powr™ X: Spring-diaphragm rotary actuator

Jamesbury Quadra-Powr X					
Product	Series	Design	Specifications	Service	Bulletin
<b>Jamesbury Quadra-Powr X</b> 	QPX-series	Rolling diaphragm design, along with new one-piece diaphragm retainer and UHMW polyethylene bearing, assures extremely long cycle-life  Low-friction operation provides exceptionally smooth actuation	<b>Action:</b> Spring return	For control and on-off actuation	A110-4



## Rack and pinion actuators: Compact pneumatic performance

Rack and pinion actuators					
Product	Series	Design	Specifications	Service	Bulletin
<b>Jamesbury rack and pinion actuators</b> 	Rack and pinion actuators	Corrosion treatments: Electroless nickel, hard anodized protection, PTFE coating	<b>Action:</b> Double acting or spring return <b>Input:</b> 2.5 – 7.0 bar <b>Torque output:</b> 3.2 – 6211 Nm	Economical rotary actuation for ball and butterfly valves	RNP: A112-1 VPVL: A111-5

## Neles valve: Smart controls and monitoring for valve performance

Neles valve controllers					
Product	Series	Design	Specifications	Service	Bulletin
<b>Neles valve controllers</b> 	ND9000™ NDX™	Designed to operate in all control valve actuators and in all industry areas. Unique diagnostics capabilities	<b>Action:</b> Single and double action, linear and rotary operation, HART® 4 – 20mA smart functions	Leading control performance for steel mills. Modular design with add on functionalities	ND9000: 7ND9021 NDX: 7NDX21

## On/off monitoring

On/off monitoring					
Product	Series	Design	Specifications	Service	Bulletin
<b>Limit switches</b> 	StoneI™ Quartz™ StoneI™ Eclipse™	On/off monitoring	Features according to industry needs	Compact on/off valve position feedback with modular design.	7 QZ 22
	StoneI™ Axiom™ on/off valve controller	On/off monitoring with integrated solenoid valve		High performance on/off valve control and position feedback  Many solenoid valve options	7 AN 20 7 AM 21 7 AX 21
	Neles™ Easyflow™	Inductive mechanical reed type.		Versatile limit switches for quarter turn actuators and valve assemblies.	S100-1



Valmet's professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

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