



FLOWSERVE NAF

Setball Product Presentation



What is the NAF Setball?

- Ball sector valve for modulating control with high-flow capacity
- V-port design for excellent rangeability
- Cost-competitive, one-piece leak-proof body design
- Low friction and smooth operation
- Metal or soft seated
- Optional low noise and anti-cavitation trims

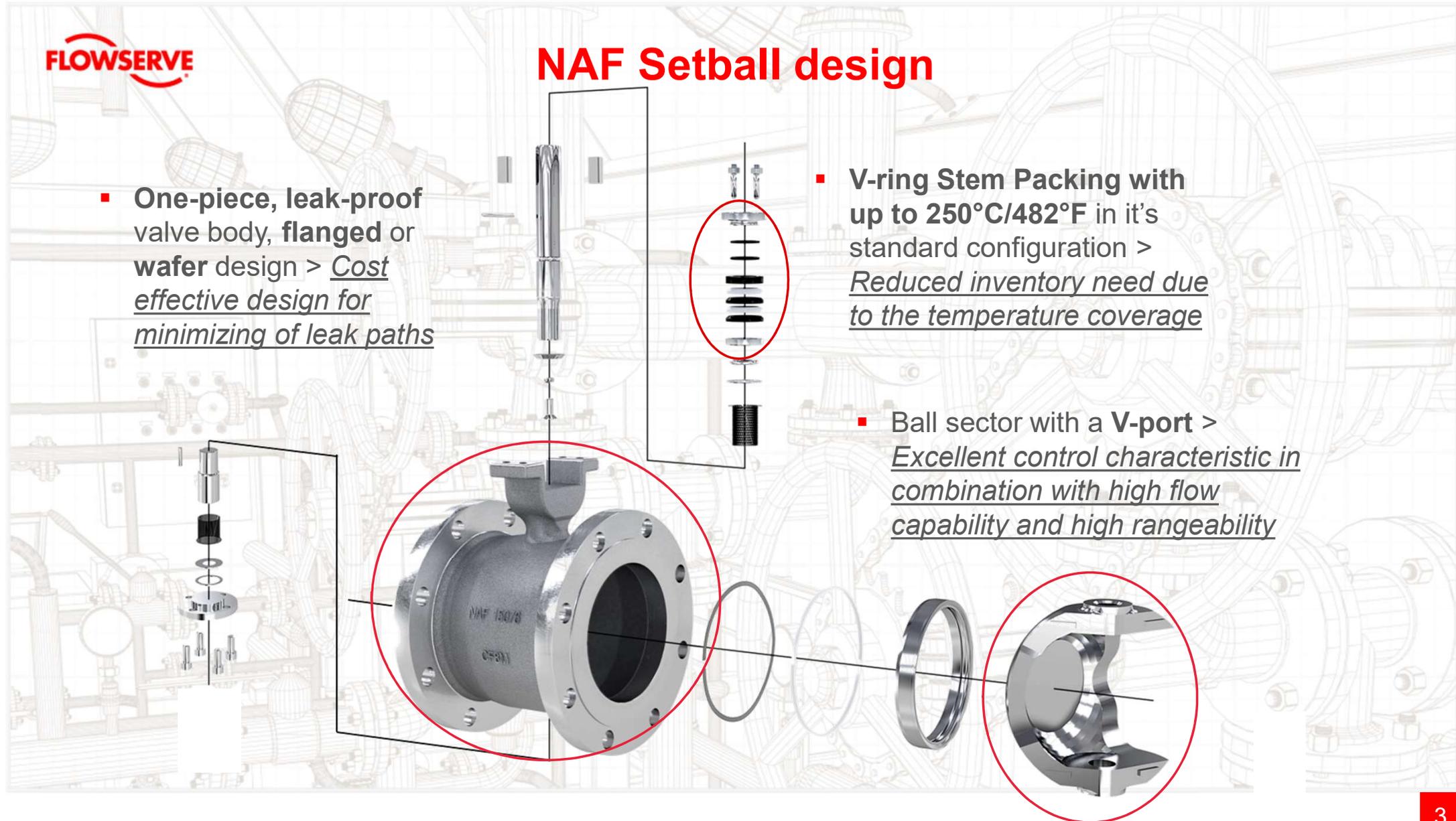


NAF Setball design

- **One-piece, leak-proof valve body, flanged or wafer design** > Cost effective design for minimizing of leak paths

- **V-ring Stem Packing with up to 250°C/482°F** in it's standard configuration > Reduced inventory need due to the temperature coverage

- **Ball sector with a V-port** > Excellent control characteristic in combination with high flow capability and high rangeability

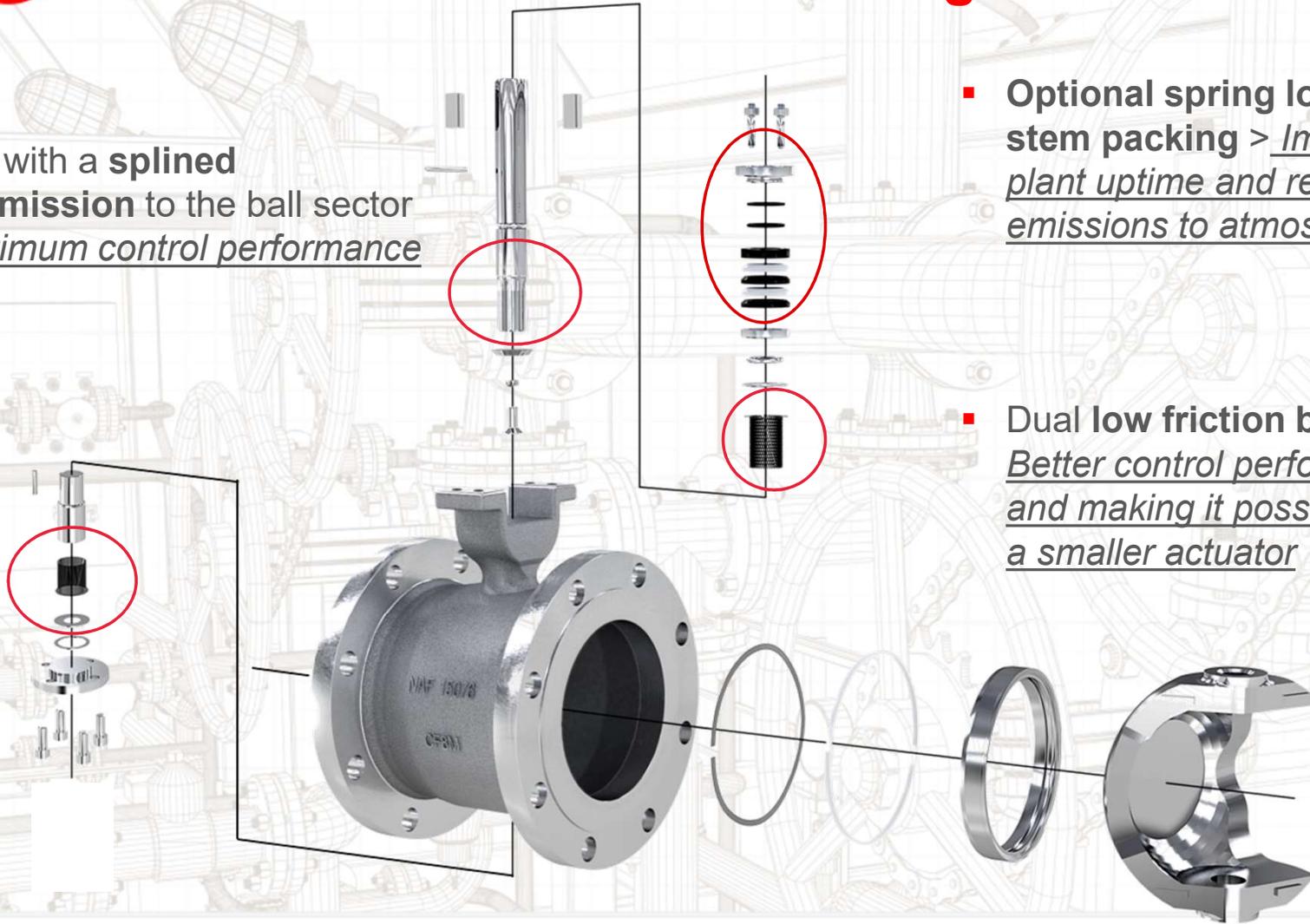


NAF Setball design

- Stem with a **splined transmission** to the ball sector
> Optimum control performance

- **Optional spring loaded stem packing** > Improves plant uptime and reduces emissions to atmosphere

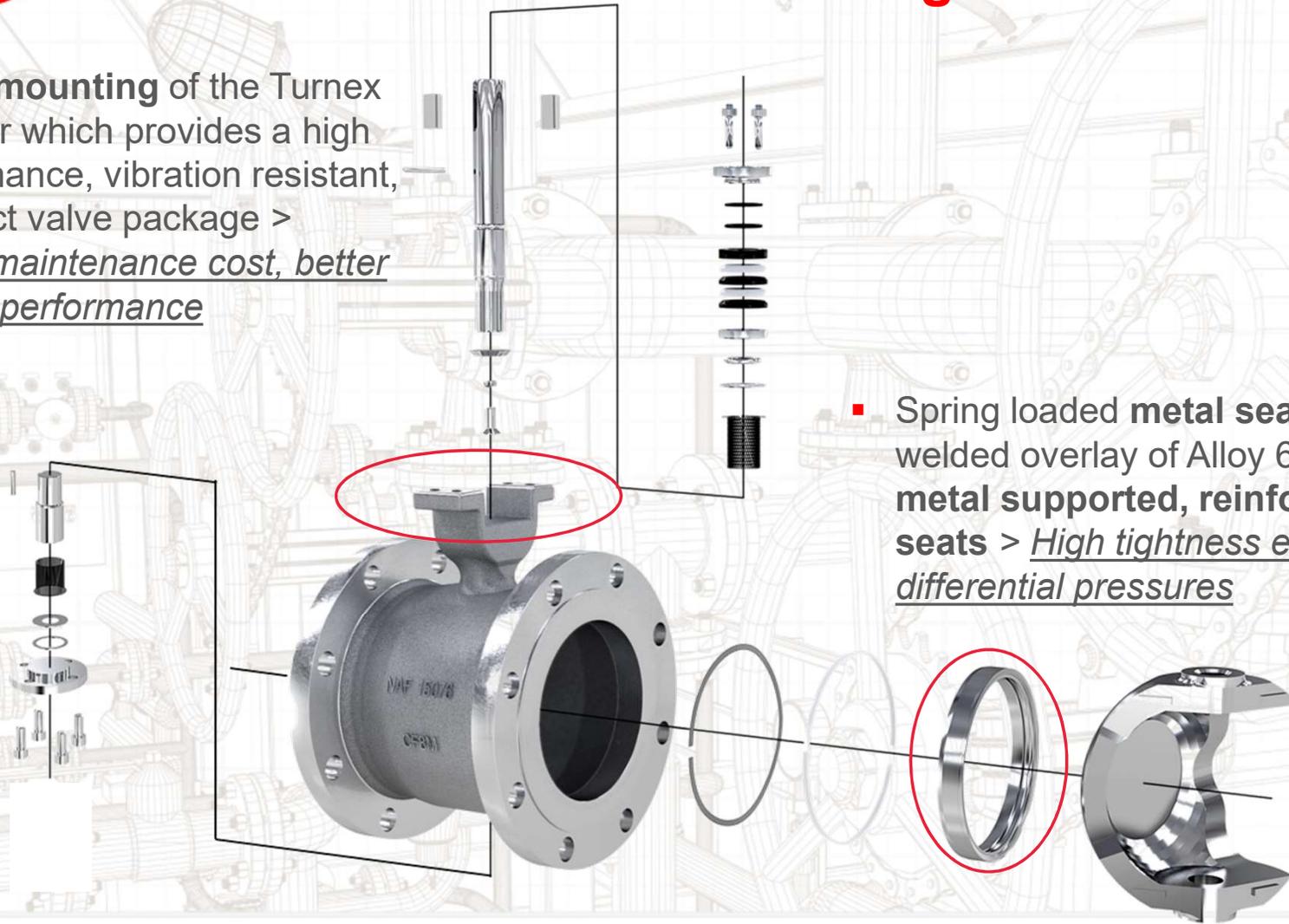
- **Dual low friction bearings** > Better control performance and making it possible to use a smaller actuator



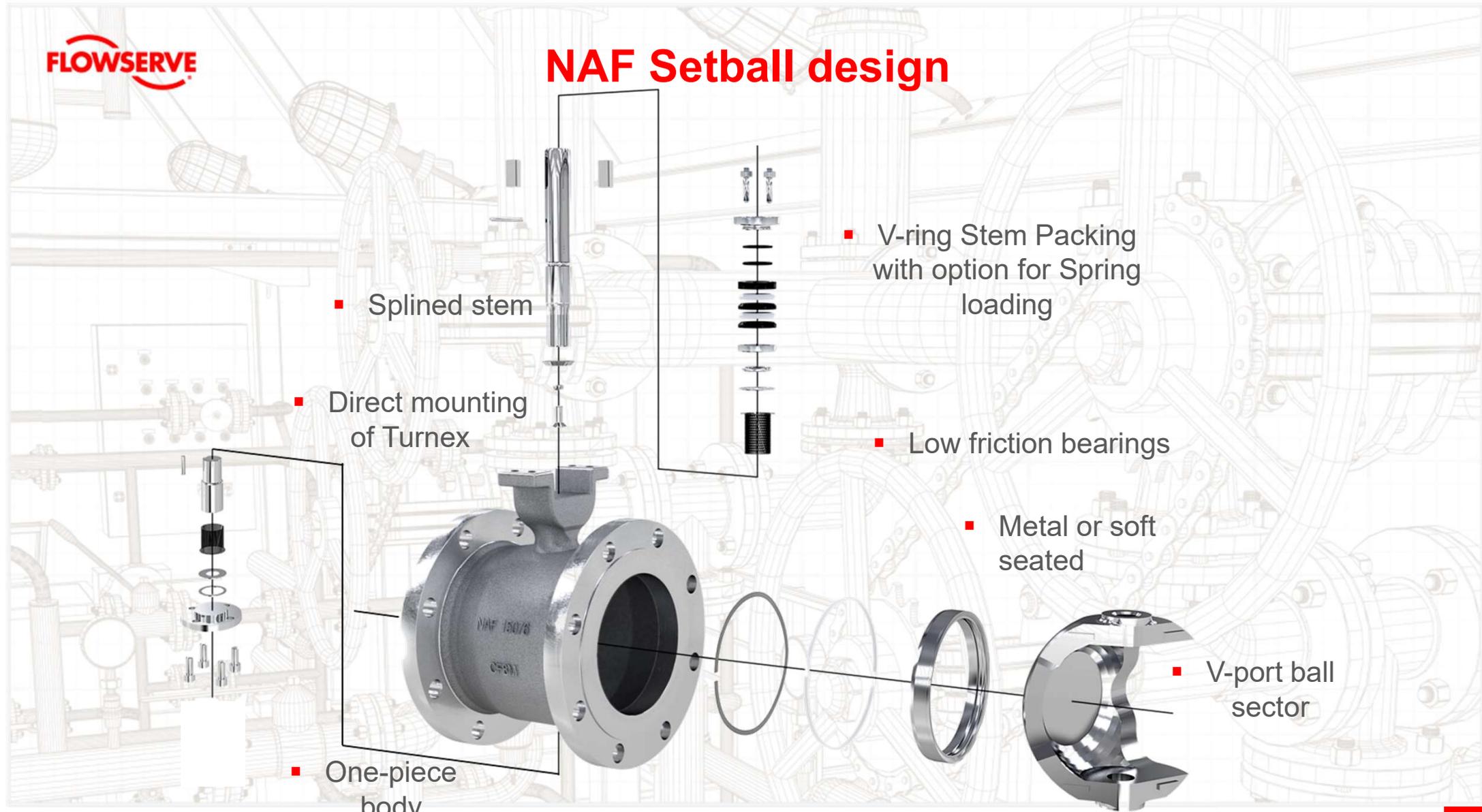
NAF Setball design

- **Direct mounting** of the Turnex actuator which provides a high performance, vibration resistant, compact valve package > Lower maintenance cost, better control performance

- Spring loaded **metal seats** with a rigid welded overlay of Alloy 6 or alternatively **metal supported, reinforced PTFE seats** > High tightness even at low differential pressures



NAF Setball design



▪ Splined stem

▪ Direct mounting of Turnex

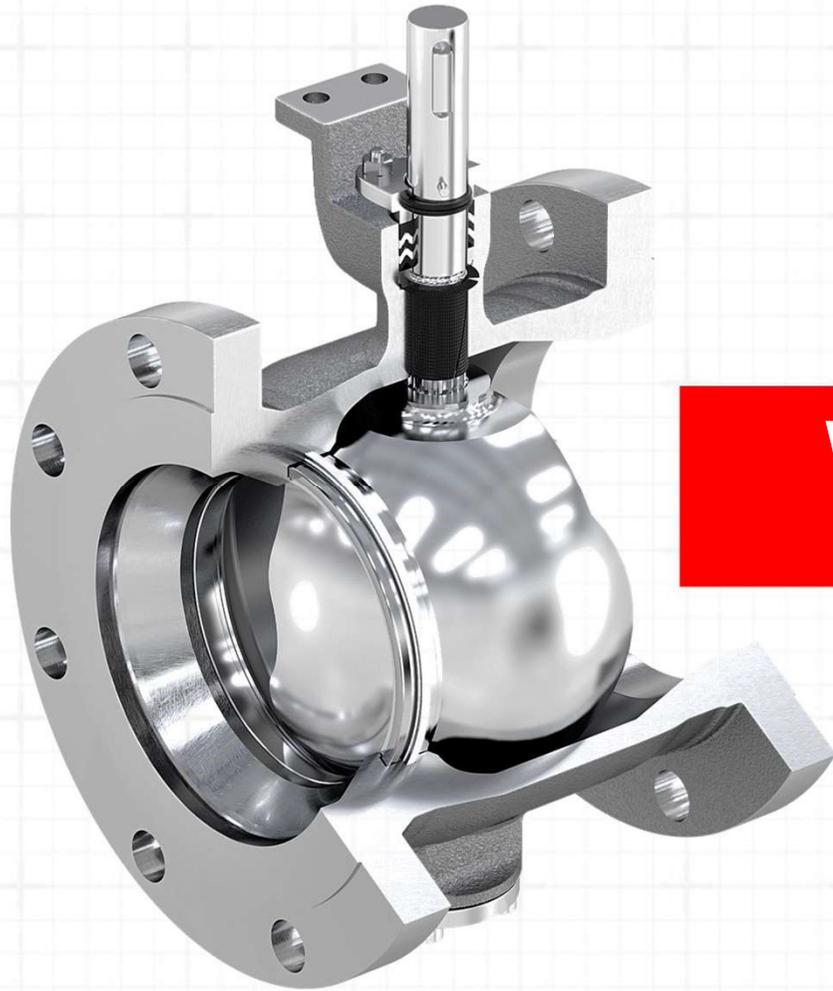
▪ One-piece body

▪ V-ring Stem Packing with option for Spring loading

▪ Low friction bearings

▪ Metal or soft seated

▪ V-port ball sector



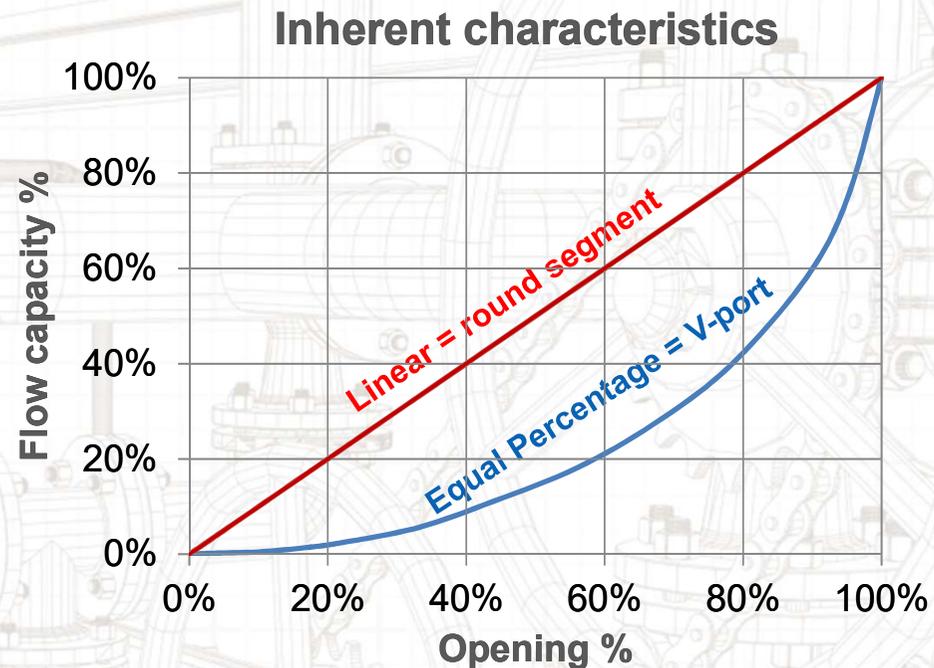
**WHY USE A V-PORT BALL
SECTOR VALVE?**

Why use a V-port ball sector?

- The valve's own, **inherent**, flow characteristic is defined as the flow capacity as a function of travel at a **constant pressure drop** over the valve

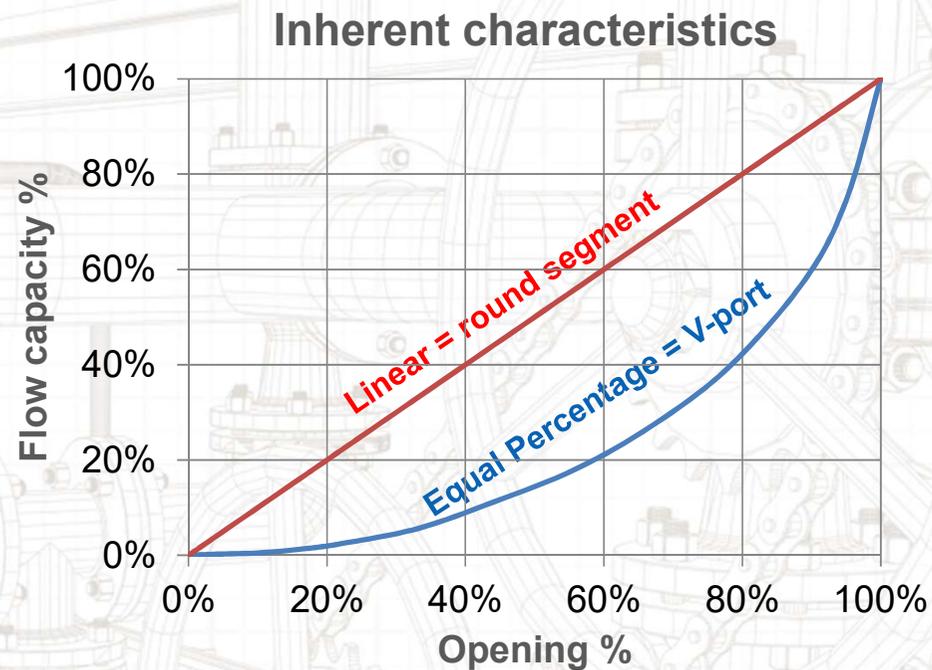
Why use a V-port ball sector?

- The graph shows a **linear** inherent characteristic, similar to what you get if you have a ball sector valve **without V-port**
- The Setball **with a V-port** has a flow characteristic which is called "equal percentage"



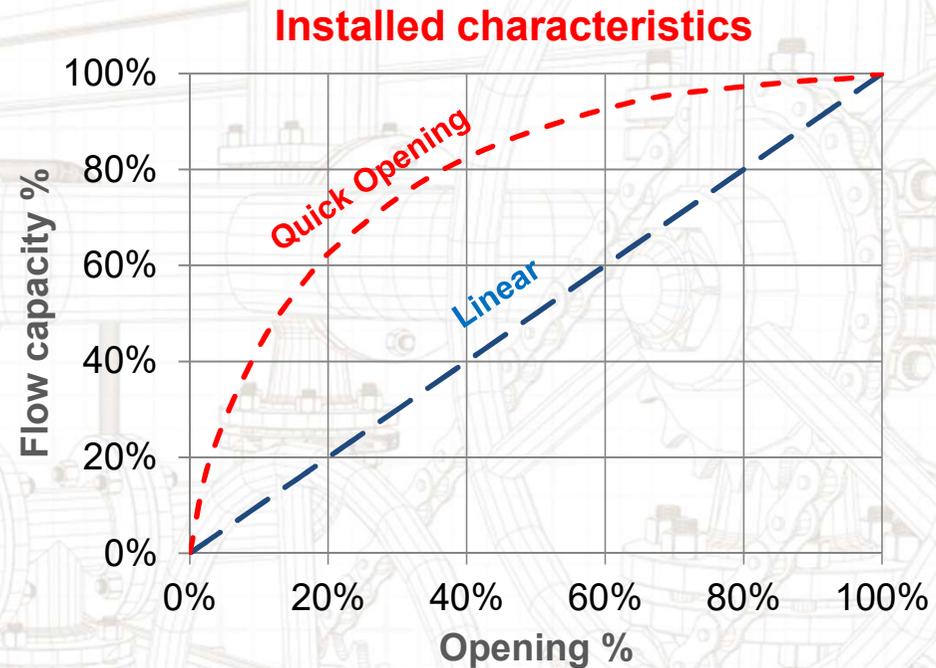
Why use a V-port ball sector?

- In real applications, **the pressure drop will almost never remain constant** due to pump characteristics and pressure losses in the pipes, etc



Why use a V-port ball sector?

- When installed in the majority of applications, the **installed flow characteristic** will be different from the inherent:



- > Inherently **Linear** will tend to become **Quick Opening** when installed
- > Inherently **Equal Percentage (V-port)** will tend to become **Linear** when installed

Why use a V-port ball sector?

- **Installed Quick Opening:**

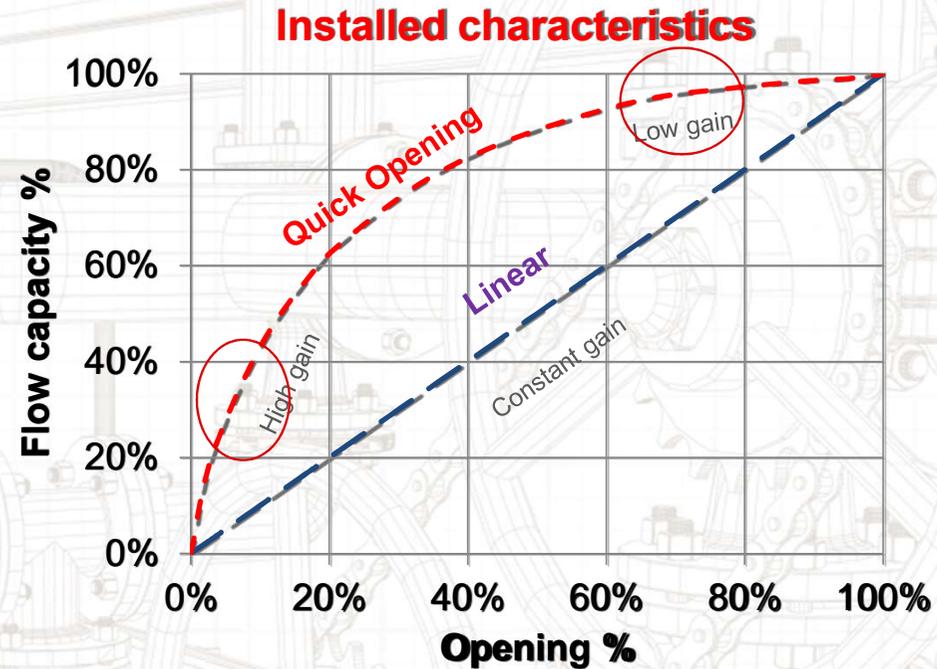
- High gain at low opening %
- Low gain at high opening %

- > *Difficult to control over a wide range*
- > *Lower rangeability*
- > *Difficult to control in a start-up mode*

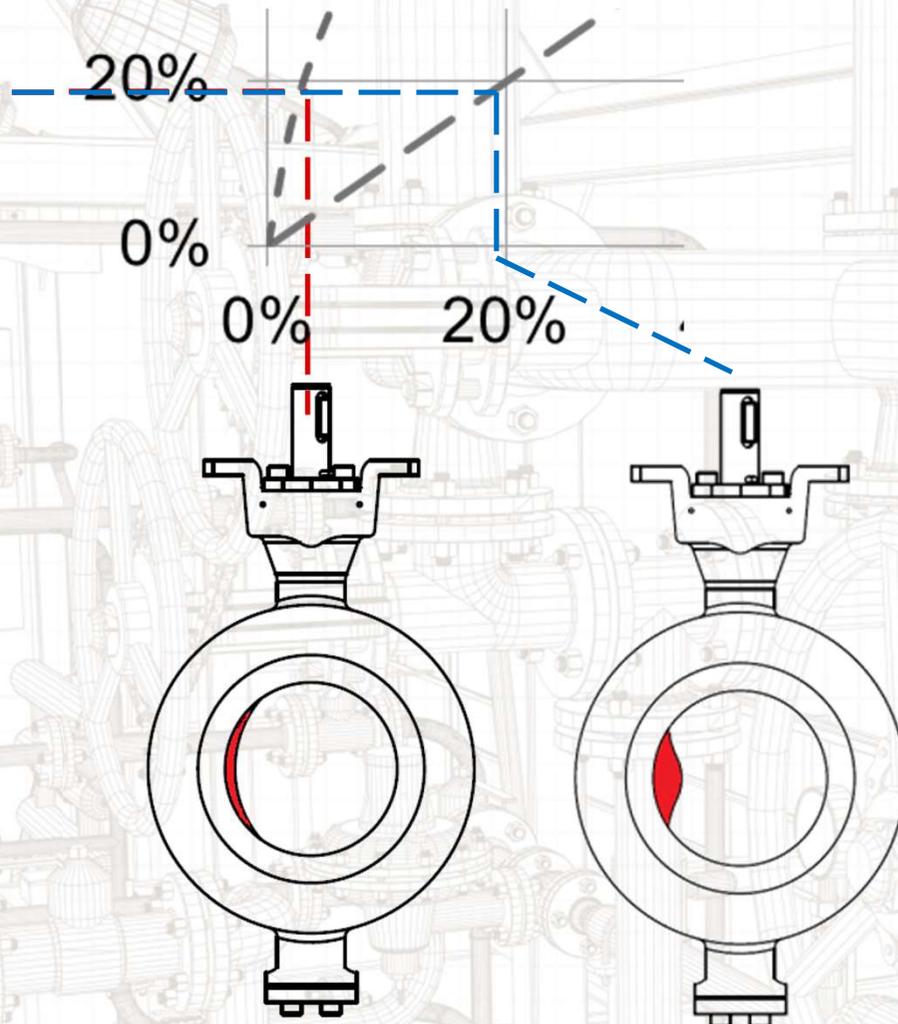
- **Installed Linear Characteristic (V-port):**

- Constant gain over entire range

- > *Easy to control over a wide range*
- > *High rangeability*



Why use a V-port ball sector for pulp applications?



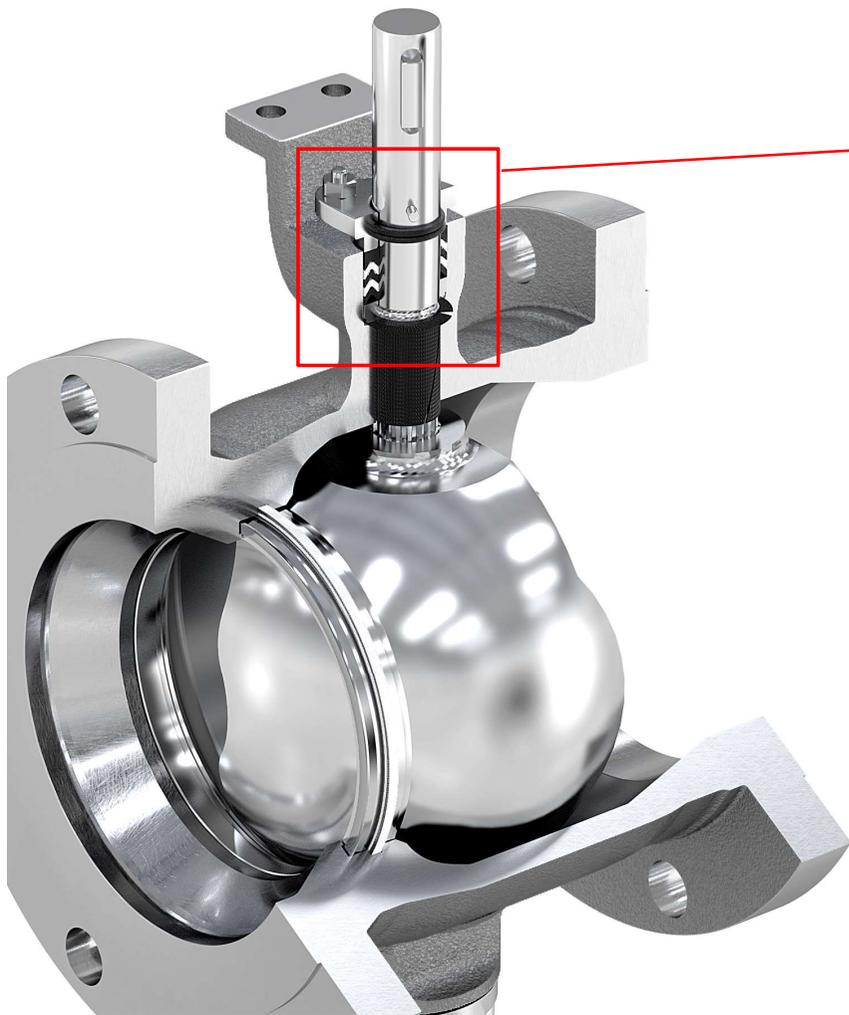
- Without V-port, controlling small flow will result in very small openings and narrow flow paths....
- ..while a V-port will result in a larger opening and a wider flow path....
-which will prevent dewatering of pulp

Why use a V-port ball sector?

- High rangeability
- Easy to control during start-up or to control at low flow
- Easier to adjust loop controller due to constant gain
- Prevents dewatering when used for pulp applications

> *Ball sector valve with V-port is a much better control valve than one without V-port*

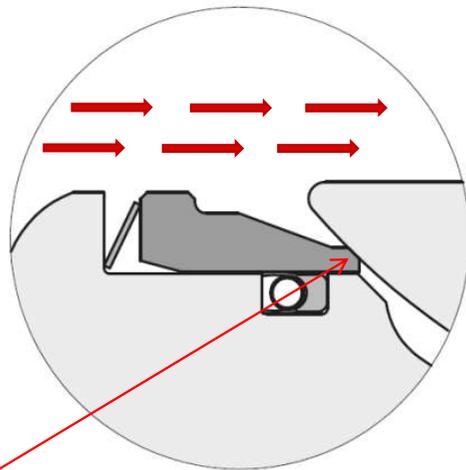
V-ring stem packing



- **V-ring Stem Packing >**
 - multistage seal, minimum risk for leakage
 - 250°C/482°F as standard
 - optional spring loaded, FET-approved, stem packing



NAF Setball - Seats

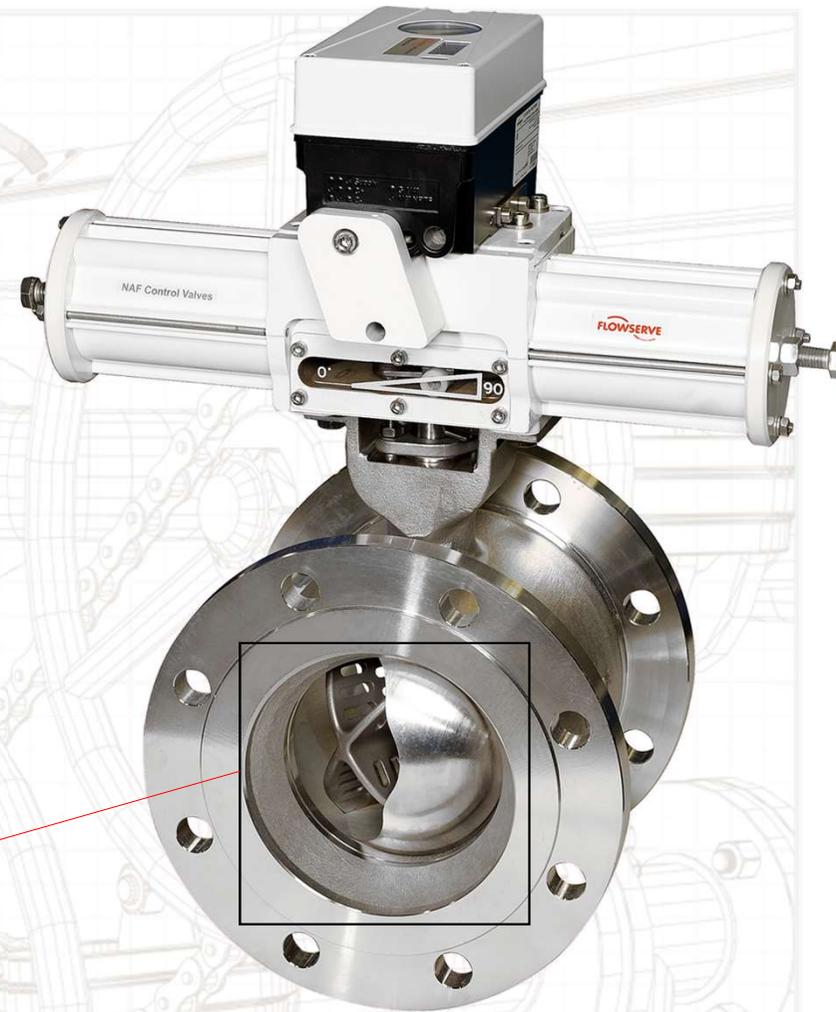


- Metal seats with a rigid welded overlay of Alloy 6 (min 2 mm)
- Seat recessed in body and not directly exposed to flow
- Optional metal supported, soft seat in R-PTFE



Z-trim option

- **Unique Z-trim™ option that minimizes cavitation and noise > Better working environment, lower maintenance cost for wear, better control performance**



Setball, some typical applications

- Paper, board and tissue machines
- Chemical and mechanical pulping applications
- Water and steam applications
- Renewable fuel and ethanol plants
- Applications with fibers or slurries
- Air separation
- District heating
- General control applications where a high Cv is needed

Note: See www.naf.se/applications for more applications



NAF Setball with Z-trim



NAF Setball



SIL 3 Capable

Material:	CF8M (Duplex, SMO, Hastelloy, Titanium etc.)
Sizes:	DN25-DN700, Size 1" – 28"
Pressure class:	PN10-PN40, ANSI Class 150 & 300
Tightness class:	PTFE-seats: EN 12266-1 Rate A Metal seats: IEC 60534-4, Class IV-S1
Connection:	Wafer, Flanged, Flanged with enlarged outlet (MC)
Temperature:	-30° to 250°C, -22° to 482°F





The NAF Setball family

The complete range of NAF Setball ball sector valves

25/1"	40/1.5"	50/2"	80/3"	100/4"	150/6"	200/8"	250/10"	300/12"	350/14"	400/16"	500/20"	600/24"	700/28"
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- Setball SF** wafer, short face-to-face
- Setball** wafer, long face-to-face
- Setball** flanged
- Setball MC** flanged, enlarged outlet



Setball SF, wafer



Setball, flanged



Setball, MC



Summary of Features and Benefits of the NAF Setball

The NAF Setball offers the following features to provide durable functionality and greater reliability for increasing process yield and plant uptime, all with a price advantage

- Ball sector with a **V-port** >
 - Excellent control characteristic in combination with high flow capability and high rangeability
 - Prevents dewatering when used for pulp applications
- **One-piece, leak-proof** valve body, **flanged** or **wafer** design > Cost effective design for minimizing leak paths
- **Up to 250°C/482°F** in its standard configuration > Reduced inventory need due to the temperature coverage
- **Dual low friction bearings** > Better control performance and making it possible to use a smaller actuator

Summary of Features and Benefits of NAF Setball

- Stem with a **splined transmission** to the ball sector > Optimum control performance
- **Direct mounting** of the Turnex actuator which provides a high performance, vibration resistant, compact valve package > Lower maintenance cost, better control performance
- Spring loaded **metal seats** with a rigid welded overlay of Alloy 6 alternatively **metal supported, reinforced PTFE seats** > Minimized risk for non-planned plant downtime due to seat damage
- **Optional spring loaded stem seal packing** > Improves plant uptime and reduces emissions to atmosphere
- **Unique Z-trim™** option that **minimizes cavitation and noise** > Better working environment, lower maintenance cost for wear, better control performance

.. and our other rotary control valves ..

■ NAF Duball DL

- High performance, floating ball valve.
- DN25/1"-DN400/16"
- PN10-PN40/ANSI Class 150 and 300



■ NAF Torex

- High performance, triple offset butterfly valve
- DN80/3"-DN700/28", wafer&lug style
- PN10-PN40/ANSI Class 150 and 300



■ NAF Trunnball DL

- High performance, trunnion mounted ball valve
- DN150/6"-DN900/36"
- PN10-PN40/ANSI Class 150 and 300





Thank you for your attention

See www.naf.se for more information