

# Products & Applications



Thermoplastic Valve Solutions

# Products & Applications

Real solution  
for corrosive fluids

Built to last...

Environment



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Chemical process industries



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Metal & lined metal  
valves replacement



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# SAFI

« You are in good hands »

*Founded in 1963, SAFI has unrivalled experience in handling corrosive and abrasive chemicals with thermoplastic materials in many applications.*

SAFI designs, manufactures and supplies to a global customer base a wide range of thermoplastic valves for demanding industries.

Many of our valves can be adapted as a flexible solution, while our R&D department can offer a tailor-made solution to your own specification.

Through SAFI's network of companies, consultants and distributors we give a fast and dedicated response to your enquiries.



**THERMOPLASTIC VALVES MANUFACTURER SINCE 1963**

## Why SAFI thermoplastic valves ? "Fit and forget"

At SAFI **we understand the importance of product reliability** and believe that thermoplastic valves are a great solution to corrosion :

- . Inert to corrosion of the **most aggressive** chemicals
- . **Less expensive** than alloy metals and **lined valves**
- . **Light weight**
- . Robust

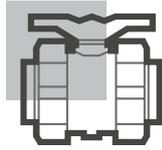
SAFI offers valves that are reliable and trouble free over a long time. Our selection of polymer materials and valve design enable our valves to last many years without maintenance.

Quality equipment **from Europe** Product **conformity** to the most stringent standards.

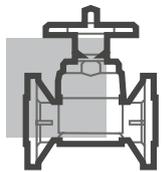
# PRODUCT RANGE

Valves, strainers, flow control equipment which can be actuated and customized with useful accessories

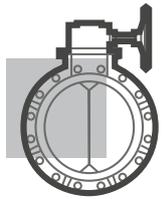
**Ball Valve**



**Diaphragm Valve**



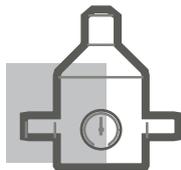
**Butterfly Valve**



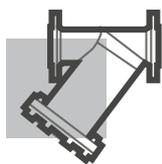
**Check Valve**



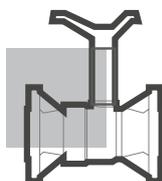
**Flow Control**



**Strainer**



**Accessories**



# MATERIAL RANGE

**GRPP**

**GRPP**

Glass reinforced Polypropylene. Contains PPH, and 20% borosilicate glass reinforced of type «C» chemically resistant with UV stabilizer. Very good mechanical and UV resistance. Resistant to temperatures from -10°C to 100°C.

**PVDF**

**PVDF**

PolyVinylidene Fluoride. Excellent chemical and physical resistance. Supports temperature from -20°C up to 120°C, ultra-violets and extremely corrosive agents. Very good abrasive resistance. Very smooth surface which avoids the development of micro-organisms.

**PPH**

**PPH**

Polypropylene. Good mechanical and chemical properties. Good thermal stability from 0°C up to 90°C, as well as good shock resistance. Good chemical resistance in particular with salts, acids and alkalis and numerous organic solvents.

**U-PVC**

**U-PVC**

Unplasticised PolyVinyl Chloride. Widely used thanks to its good chemical behavior. But resists only to moderate temperature from 0°C up to 60°C and has a low shock resistance, which limits its application in the industry. Poor resistance to UV.

**C-PVC**

**C-PVC**

Chlorinated PolyVinyl Chloride. Superior density than U-PVC and greater range of thermal behavior from 0°C up to 90°C.

**ATEX**



**PP-ATEX**

PPH thermoplastic with carbon fibers which makes the plastic semi-conductive and compliant with the ATEX norm.

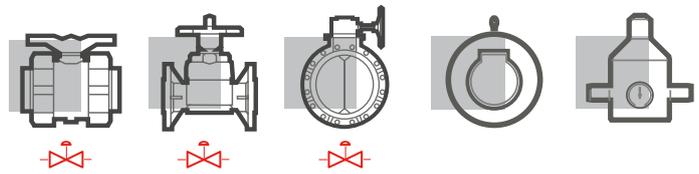
# Why THERMOPLASTIC in environment ?

- o Excellent resistance to chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance

## References

VEOLIA, SUEZ, VIRIDOR,  
GEA WIEGAND

## Environment



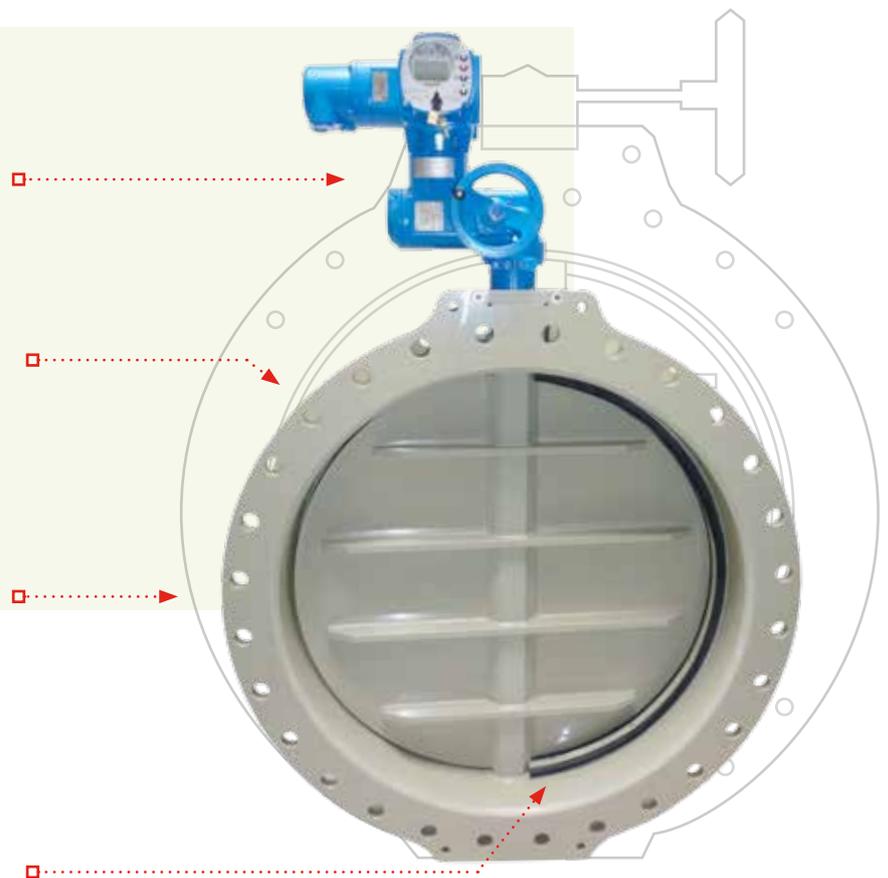
## PRODUCT FOCUS

Actuator with Positioner

Ventilation Damper DN 900 in PPH

UV Resistant Coating

Tightness compliant  
with standard EN 1751



## Actuated ventilation damper



## Applications of SAFI products

### Water treatment

- Drinking water process
- Waste water treatment
- Water treatment mobile water units
- Desalination plants

### Industrial process water

- Water intake and filtration
- Industrial water treatment
- Gas scrubbers

### Waste treatment & recycling

- Landfills and gas collection
- Incineration plant
- Recycling facilities

### Gas Fume Scrubbers

### Geothermal



Geothermal



Gas ventilation and scrubber

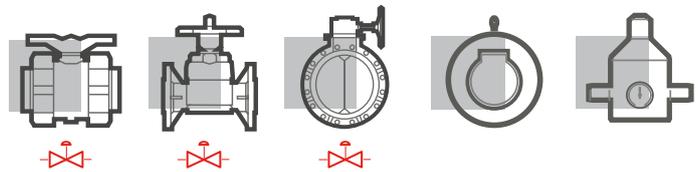
# Why THERMOPLASTIC in chemical process industry ?

- o Excellent resistance to very aggressive chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance

## References

BASF,  
SOLVAY, ARKEMA,  
BAYER, EVONIK,  
SANOFI-AVENTIS,  
QATAR CHEMICALS,  
NCP CHLOROCEM,  
...

## Chemical process industry

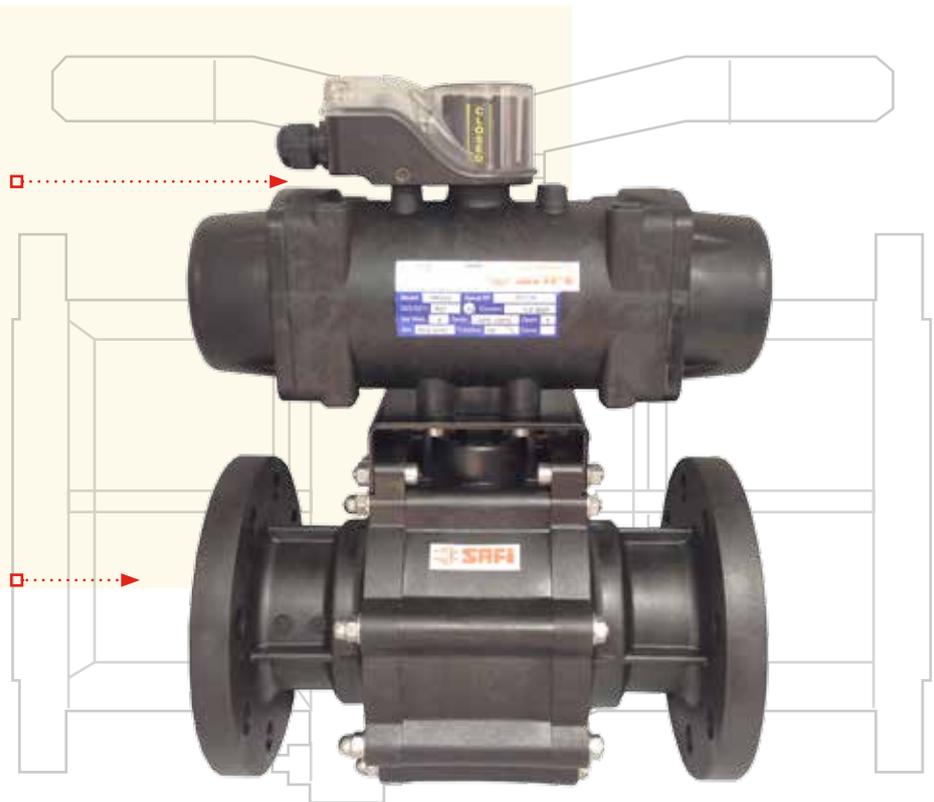


## PRODUCT FOCUS

«Heavy Duty»  
Pneumatic Actuator

4" Compact Flanged Ball Valve in GRPP

+ UV Resistant  
+ Reinforced Metal Flanged



## 4" Actuated flanged ball valve



## Applications of SAFI products

### Production of raw chemical products

Chemical plants (chlorine alkali, sulphuric acid, ...)  
Polymer industry

### Production of fine and derived chemical products

Fine chemicals  
Pharmaceutical  
Paints manufacturers  
Detergents manufacturers  
Body products manufacturers



HCl production



Sulphuric acid line

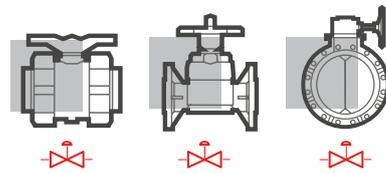
# Why THERMOPLASTIC in transport and storage ?

- o The same thermoplastic material can resist a wide range of chemicals
- o Excellent resistance to chemical products
- o No external corrosion
- o Good mechanical resistance
- o Attractive price

## Reference

SCHOELLER ALLIBERT  
PROMENS, BRENTAG, UNIVAR

## Transport and storage

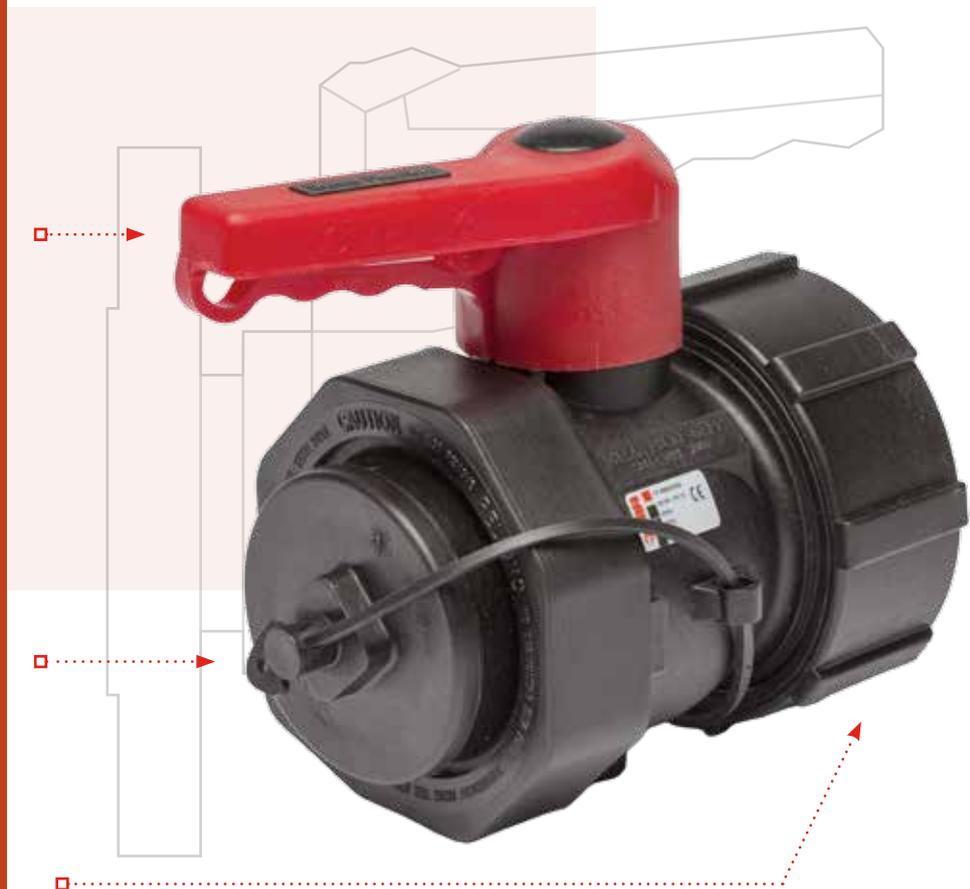


## PRODUCT FOCUS

Lockable Handle

IBC Ball Valve

Customizable connection to the container



### IBC Ball valve



○ Applications of SAFI products

- Manufacturers of IBCs
- Manufacturers of +1000L tanks
- Manufacturers of Flexitanks
- Chemical storage facilities
- Chemicals distributors



Chemical discharge area



IBC tank

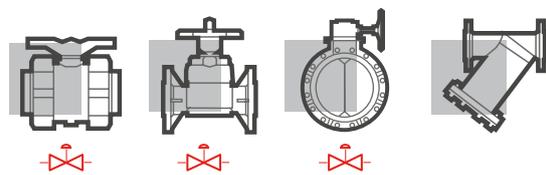
## Why THERMOPLASTIC in mining ?

- o Excellent resistance to chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o Attractive price compared to metals

### References

ANGLO AMERICAN, ERAMET,  
RIO TINTO, CODELCO, AREVA,  
OFFICE CHÉRIFIEN DES PHOSPHATES,  
MAADEN, SNC LAVALIN, BHP BILLITON,  
IMPALA PLATS, SIBANYE GOLD

## Mining

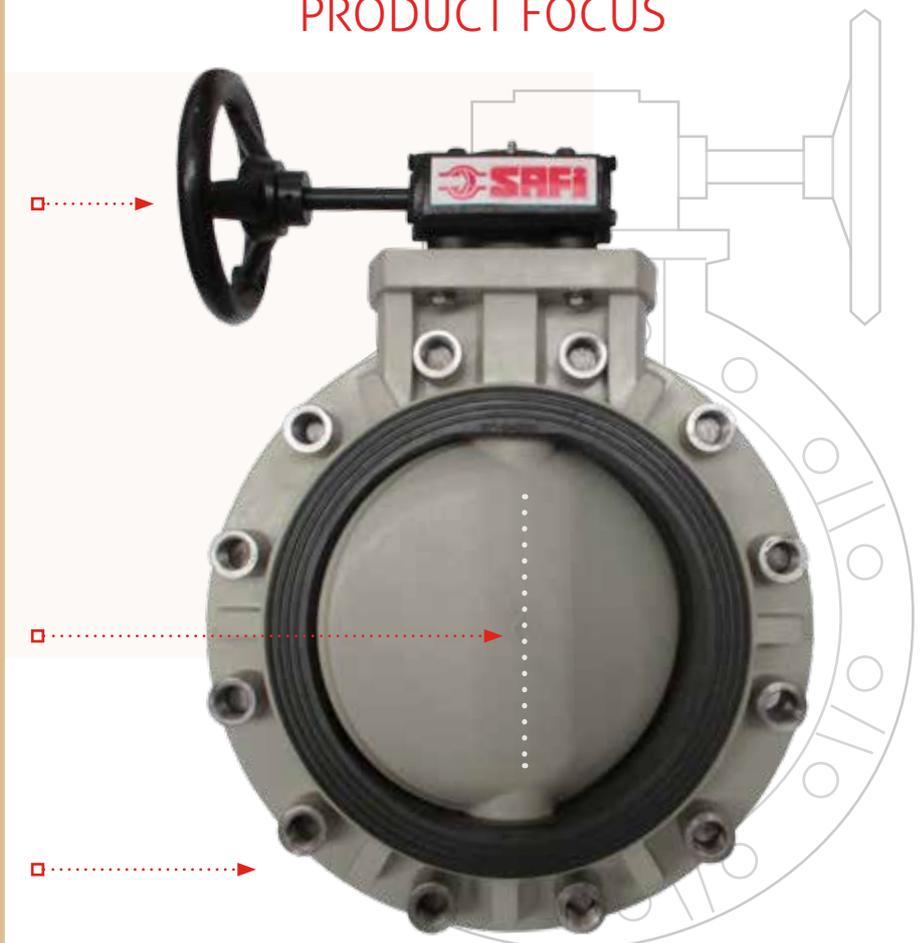


### PRODUCT FOCUS

Special coating and painted version gearbox

Hastelloy shaft

LUG type flanges with 316 L threads



### DN 400 Butterfly valve - LUG type



## Applications of SAFI products

### Mines

- Copper mines
- Zinc mines
- Nickel mines
- Uranium mines
- Phosphate mines
- Potassium mines
- Gold mines
- Rare earth

### Processes

- Heap leaching
- ISL
- Solvent extraction
- Electrowinning
- Acid plants



Heap leach process



Electrowinning

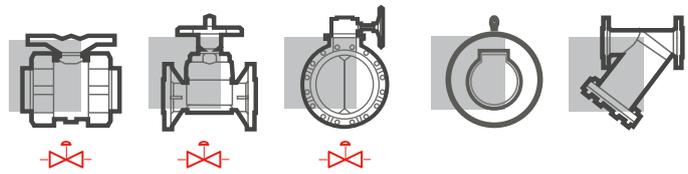
## Why THERMOPLASTIC in surface treatment ?

- o Excellent resistance to highly concentrated chemicals
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance

### References

ARCELOR MITTAL, UGINE, AGFA, FEDERAL MOGUL

## Surface treatment



## PRODUCT FOCUS

Limit Switch Box

Double Acting Pneumatic Actuator

2" Diaphragm Valve in PVDF FPM Diaphragm





### Applications of SAFI products

- Metal pickling
- Metal plating
- Galvanizing
- Photovoltaic panels construction
- Semi-conductor industry
- Glass manufacturing
- Degreasing



Metal pickling



Zirconium sheet degreasing

## Why THERMOPLASTIC in food products ?

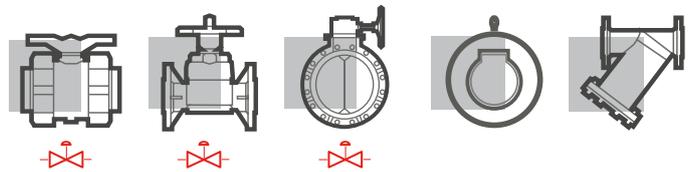
- o Excellent resistance to chemical products
- o Suitable for food products and potable water
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o Attractive price

### References

UNILEVER, DANONE, MARS,  
KALLE, VISKASE, CHAPOUTIER

## Food products

GRPP PVDF PPH U-PVC C-PVC



## PRODUCT FOCUS

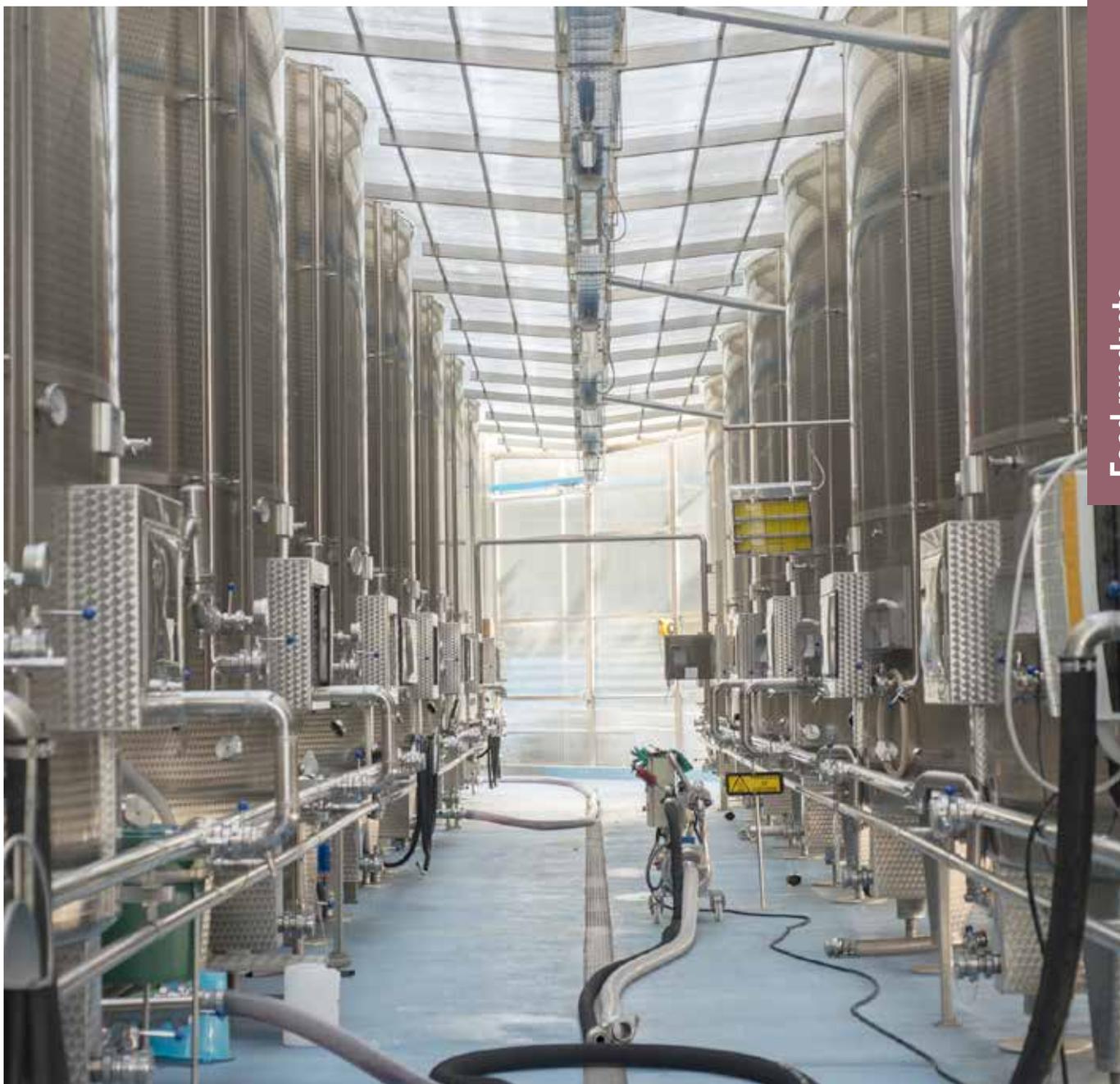
Electric actuator IP68  
with signal feedback

Secure manual override

GRPP ball valve DN50



**2" electrically actuated GRPP Ball valve**



## Applications of SAFI products

### Food industry

- CIP (cleaning in place)
- Manufacturing process
- Brine process
- Waste treatment plant

### Slaughter house

### Beverage industry (Wine, sodas, brewery malt production)

- Equipment cleaning
- Water processing



H<sub>2</sub>SO<sub>4</sub> line (sausage factory)



Slaughter house piping cleaning

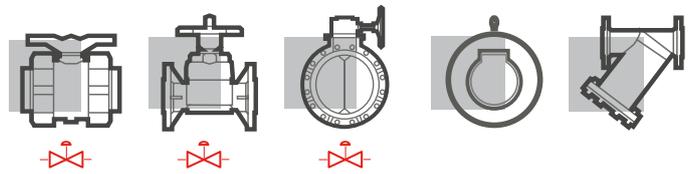
# Why THERMOPLASTIC in energy ?

- o Long lasting resistance to chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o Attractive price

## References

EDF (ELECTRICITÉ DE FRANCE)  
 BRITISH ENERGY  
 E.ON, GENERAL ELECTRIC

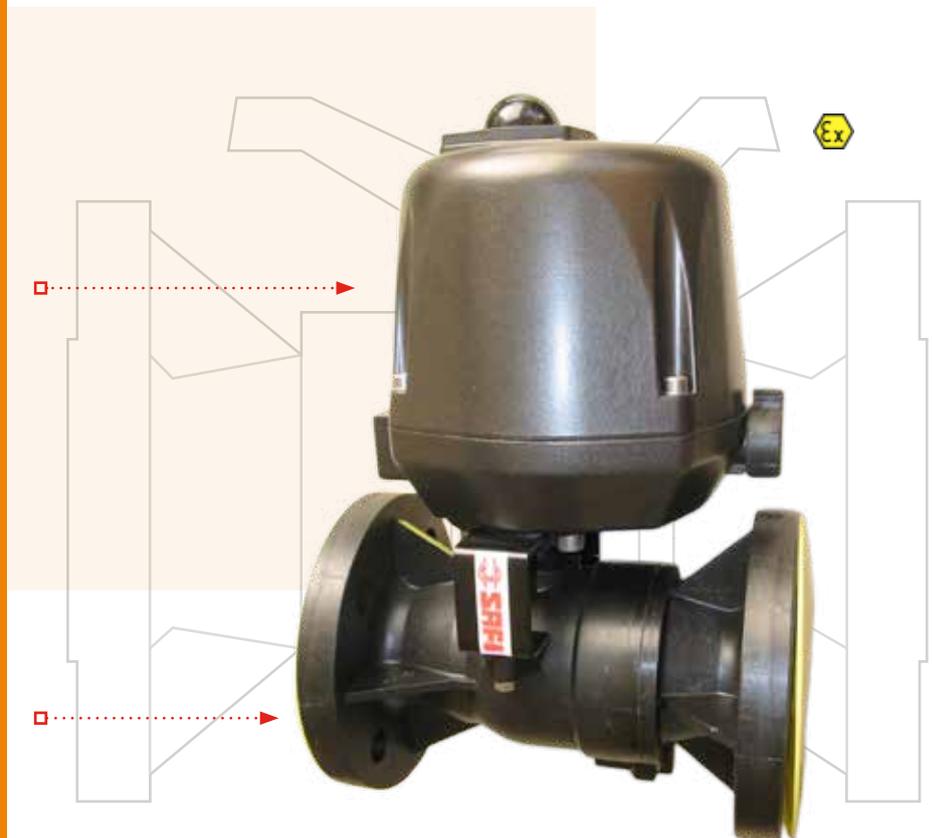
# Energy



## PRODUCT FOCUS

Electric Actuator  
 ATEX - 11260 Exd II BT 5

2" Flange Ball Valve (PP ATEX)



## ATEX electric actuated ball valve



## Applications of SAFI products

### Power plants

- Demineralised water
- Anti-scaling treatment
- Amibia treatment
- Electrochlorination
- Desalination
- Water treatment
- Sodium hypochlorite systems

### Waste to energy

- Methane
- Biogas



Water demineralisation unit



Anti-scaling unit (H<sub>2</sub>SO<sub>4</sub> 96%)

## Why THERMOPLASTIC for OEM ?

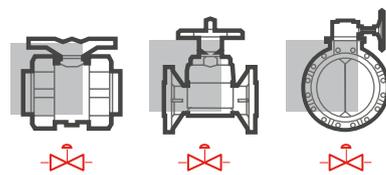
- o Excellent resistance to a wide range of chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o High robustness

### References

BIOQUELL, HONEYWELL,  
JOHN DEERE, EXEL INDUSTRIES,  
MEBCO

## OEM (Original Equipment Manufacturer)

GRPP PVDF PPH U-PVC C-PVC



## PRODUCT FOCUS

Low consumption electric actuators

3 way modular compact ball valve in PA

Main collector



## Modular crop sprayer valve



OEM



### Applications of SAFI products

- Battery manufacturing
- Medical equipment (dialyse skids)
- Bath and spa manufacturing
- Fountains manufacturers
- Material cleaning systems
- Crops sprayers
- Air flow control



Valve for ventilated pressurised suit



Crops sprayer modular valve

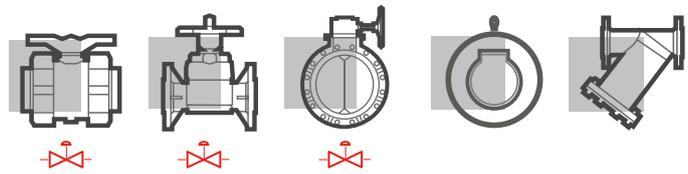
# Why THERMOPLASTIC in oil & gas & refineries ?

- o Excellent resistance to chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o SAFI products are approved by TOTAL

## References

TOTAL, SHELL  
PETRONAS, AGIP, ENI

## Oil & Gas & Refineries

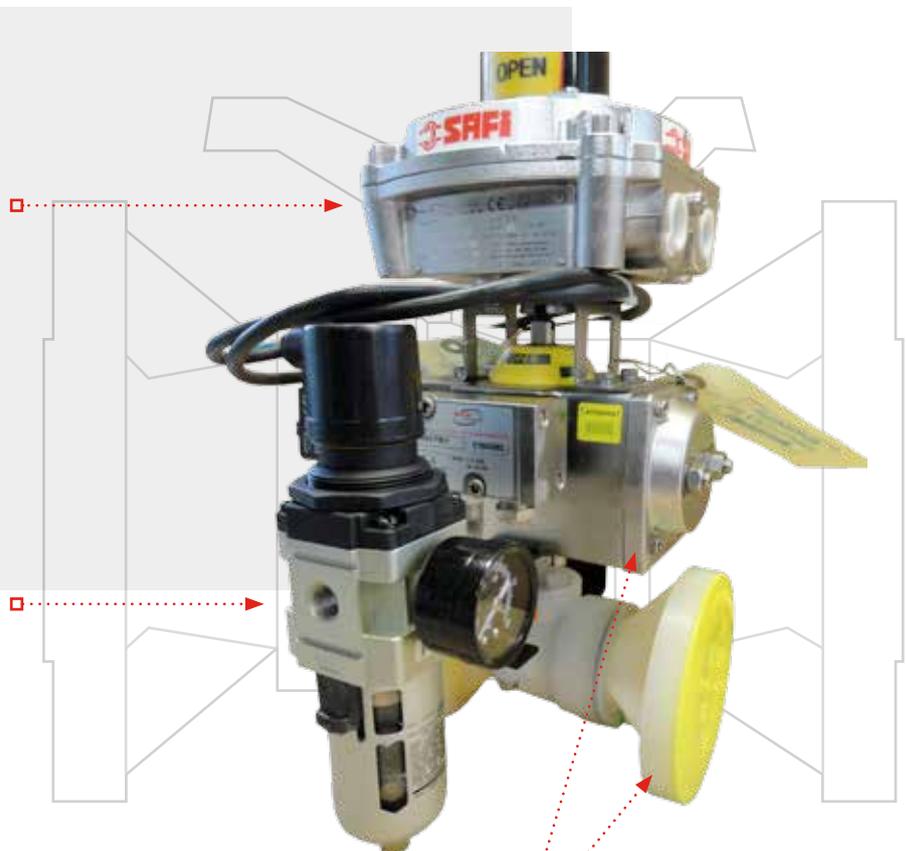


## PRODUCT FOCUS

Limit Switch Box SS316

Filter Regulator

Pneumatic Actuator SS316  
Flange Ball Valve in PVDF



## PVDF ball valve pneumatic actuated SS316



## Applications of SAFI products

### Offshore platforms and on shore extractions

- Electrochlorination
- Waste water, drinking water, demineralized water skids
- Prevention of contamination of the marine environment

### Refineries

- Alkilation process
- Dozing plants
- Scrubbers
- Treatment of effluents

### Utilities

### Chemical injection skids

### FPSO

- Sodium hypochlorite processing



FPSO (Sodium hypochlorite processing)



Electrochlorination

# Why THERMOPLASTIC in marine ?

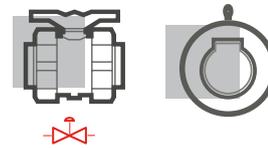
- o Excellent resistance to chemical products and salty environment
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o Robust products
- o Attractive price compared to metal valves

## References

SUNSEEKER, PRINCESS YACHT  
RNLI, NAVY BOATS, HAMANN

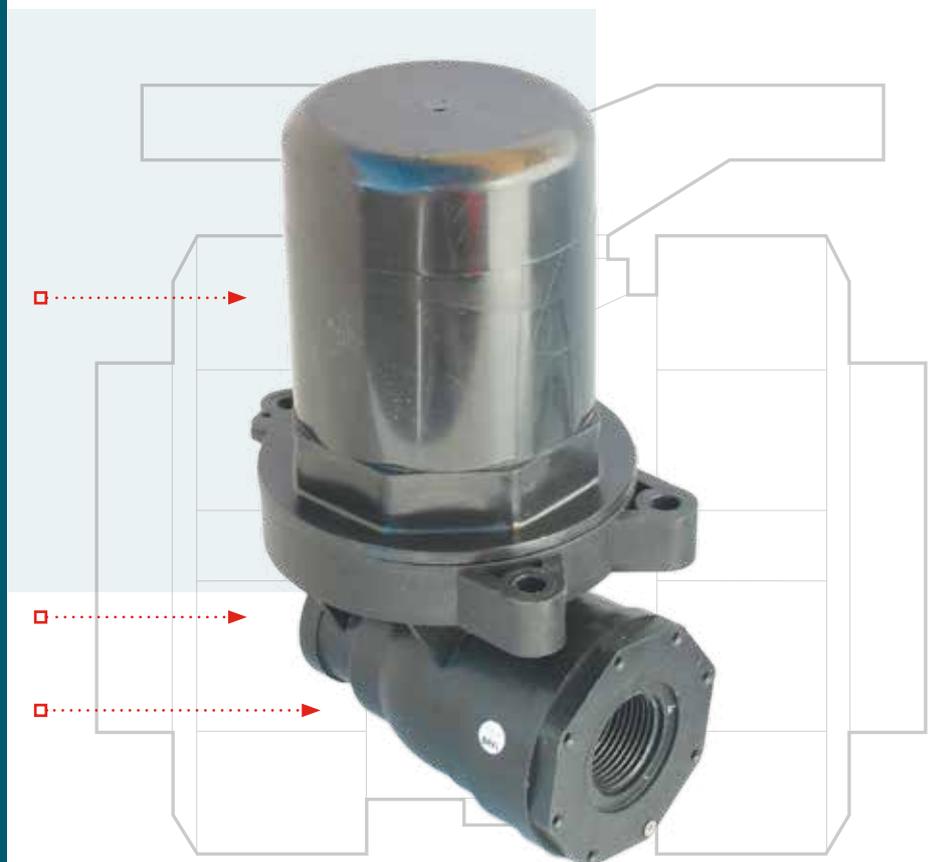
## Marine

GRPP PVDF PPH U-PVC C-PVC



## PRODUCT FOCUS

- Actuated compact valve
- Valve & actuator in same casing
- 1" compact ball valve in GRPP



## Compact electrically actuated ball valve



### Applications of SAFI products

- Fresh water
- Engine cooling system with sea water
- Bilge water system
- Black & grey water systems (waste water systems from showers, sinks)
- Desalinization unit
- Fuel system
- Hydraulic oil system
- Anti-freeze system
- Air-conditioning unit



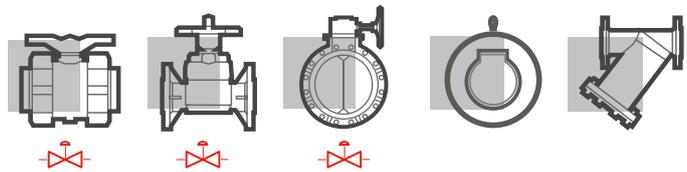
Bilge water system



Engine cooling system with sea water

# Metal and lined metal valves replacement

GRPP PVDF PPH U-PVC C-PVC ATEX 



## Replacement of PTFE lined metal valves by thermoplastic valves

- o PTFE lined metal valves often get replaced by thermoplastic valves
- o PTFE cracks
- o PTFE is easily eroded through abrasion



## Resistance to abrasion

TABER test :

Materials	Abrasive Disk	Weight Loss (mg/1000 rev.)
Solef®PVDF homo-polymers	CS-10	5-10
	CS-17	7-10
PP (homopolymers)	CS-10	15-20
	CS-17	18-28
304 stainless steel	CS-10	50
PTFE	CS-10	500-1,000

Solvay document (SOLEF Design & processing guide ©, p23)



## Replacement of rubber lined metal valves by thermoplastic valves

- o Rubber lined metal valves are replaced by plastic valves
- o Rubber gets eroded
- o No external corrosion protection



# Metal & diaphragm valves replacement

GRPP PVDF PPH U-PVC C-PVC ATEX 



>>> BUILT TO LAST ...

## Replacement of diaphragm valves by ball valves

- o Diaphragm valves (regulation valves) are often used for on/off applications and are replaced by ball valves which close faster and last longer.
- o Diaphragm valves need regular maintenance
- o Diaphragms break (PTFE)





## Replacement of metal valves by thermoplastic valves

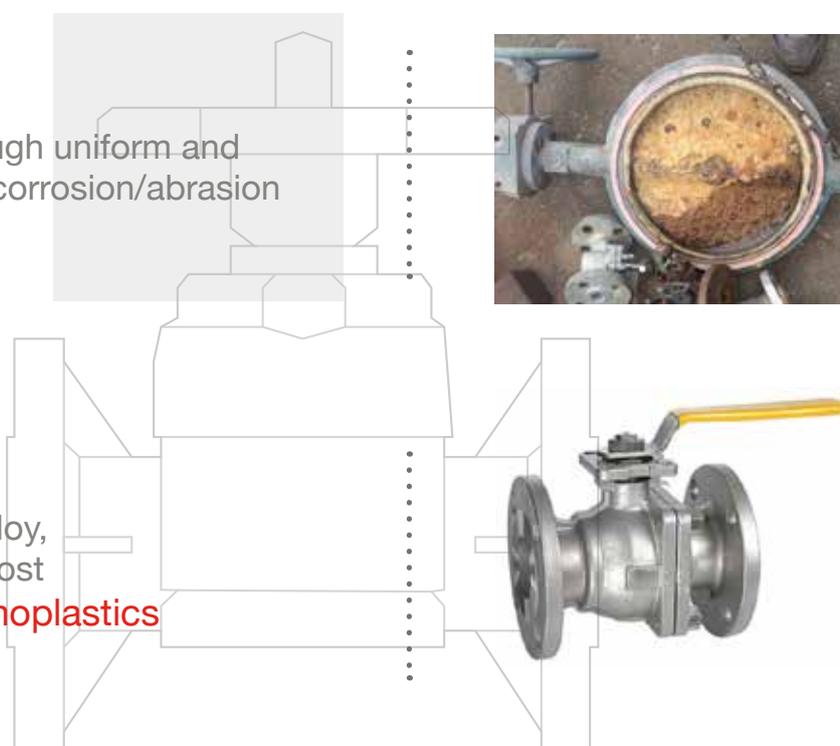
o Metal valves **are replaced** by plastic valves when pressure and temperature are right



o Corrosion of metal through uniform and attack and other forms of corrosion/abrasion



o Some metals, like hastelloy, do not corrode easily but cost **10 times more than thermoplastics**



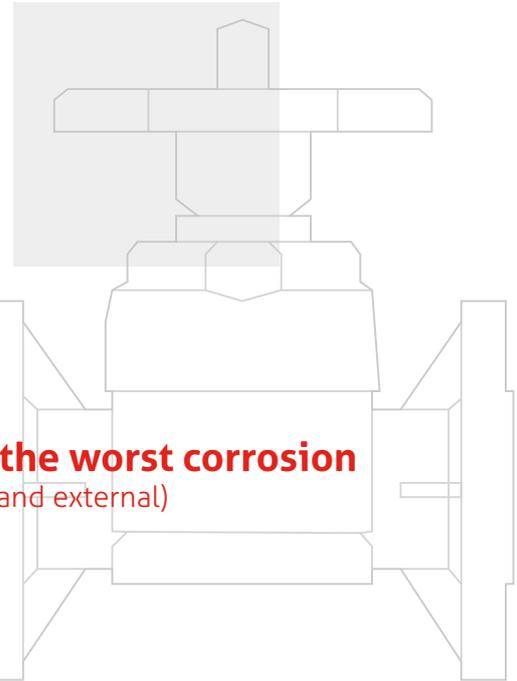
# The advantages of THERMOPLASTIC valves :



GRPP valve



PPH valve



**Resist the worst corrosion**  
(internal and external)

## Material advantages

### Metal

### Thermoplastic

### Client advantages

PTFE Lined metal valves X 100 times less resistant to abrasion than PVDF



**Reduces operational costs**

Hastelloy valves X 10 times more expensive than PPH valves



**Makes your budget go further**

Metal valves at least X 5 times heavier than thermoplastic valves for the same DN



**Reduces support and logistic costs. Critical in some applications (boats)**



**RESULT : highly reliable & secure product**

o High chemical  
and abrasive resistance



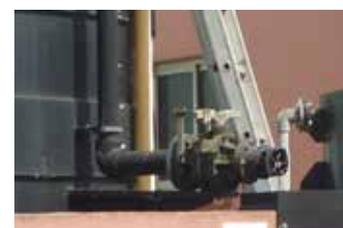
(H<sub>2</sub>SO<sub>4</sub>, HCl...)

o Long lasting



(+ 40 years old valve)

o UV resistant



(30 years old valve)

o Extremely  
mechanically resistant



(360 kg)



Thermoplastic Valve Solutions

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