

## Products & Applications



Thermoplastic Valve Solutions

# Products & Applications

Real solution  
for corrosive fluids

Built to last...

Environment



P06

Chemical process industries



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Transport and stockage



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Mining



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Metal & lined metal  
valves replacement



P26



# 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

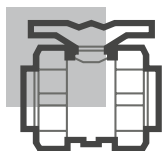
SAFI offers valves that are reliable and trouble free over a long time. Our selection of polymer materials and valve design enable our valves to last many years without maintenance.

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

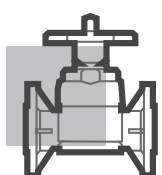
# PRODUCT RANGE

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

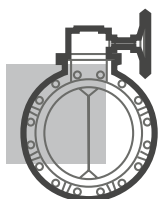
**Ball Valve**



**Diaphragm Valve**



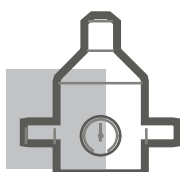
**Butterfly Valve**



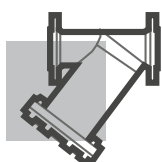
**Check Valve**



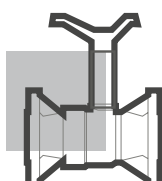
**Flow Control**



**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

PolyproPylyene. 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.

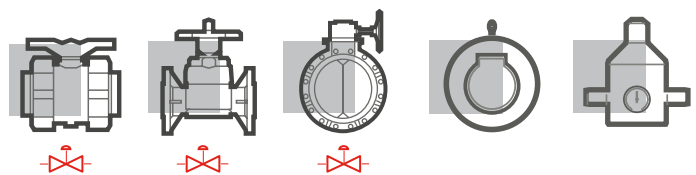
## Why THERMOPLASTIC in environment ?

- 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



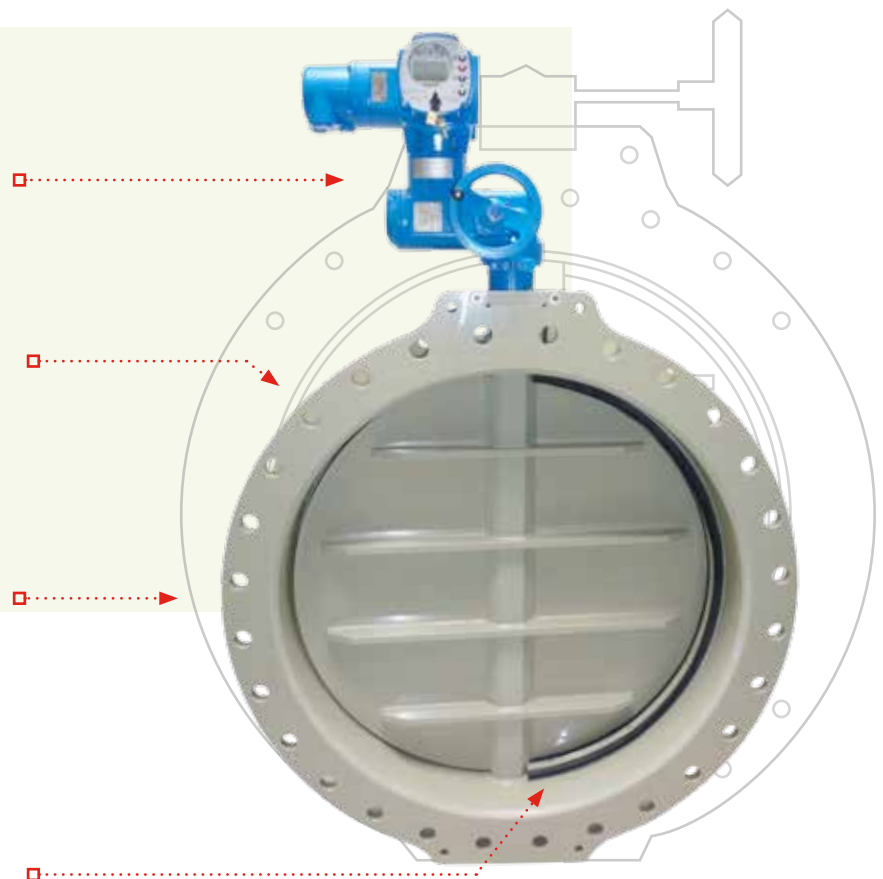
## PRODUCT FOCUS

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

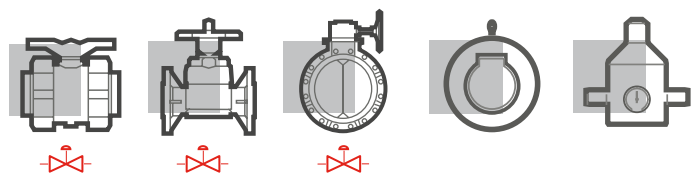
## Why THERMOPLASTIC in chemical process industry ?

- 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

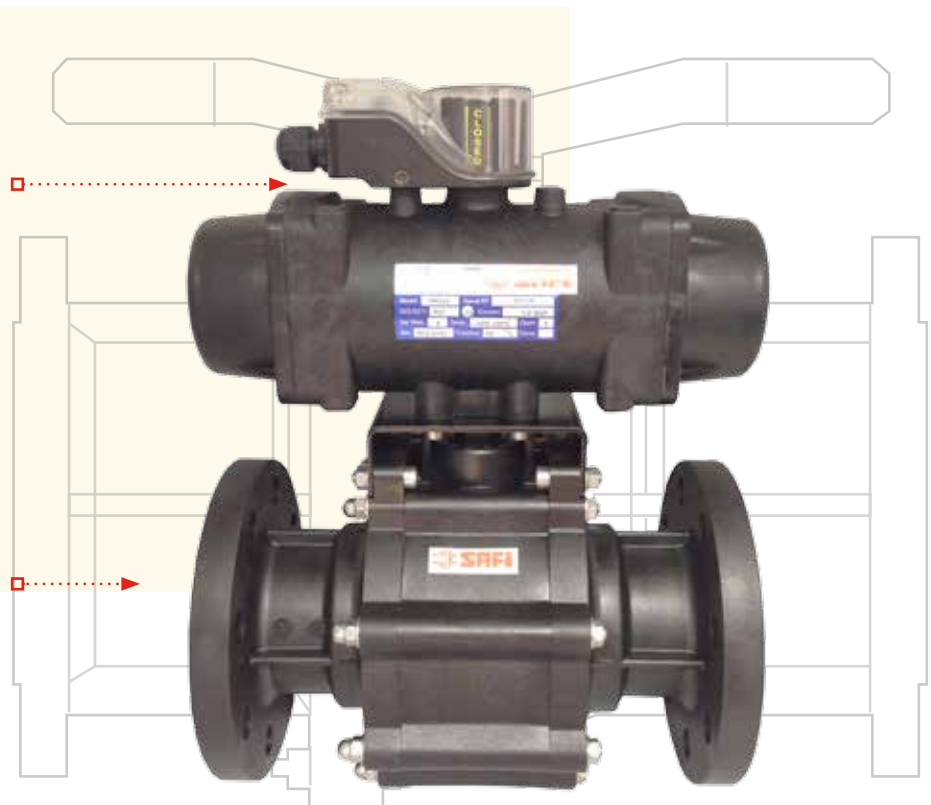


## PRODUCT FOCUS

«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, BRENNTAG, UNIVAR

## Transport and storage

GRPP

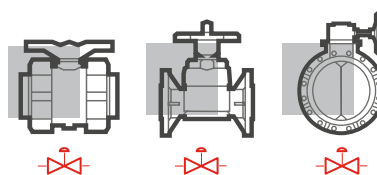
PVDF

PPH

U-PVC

C-PVC

ATEX



## 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

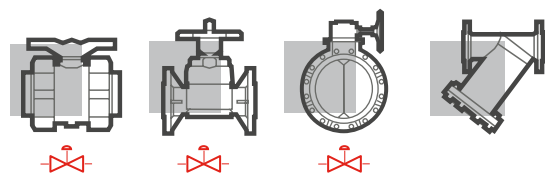
## Why THERMOPLASTIC in mining ?

- 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

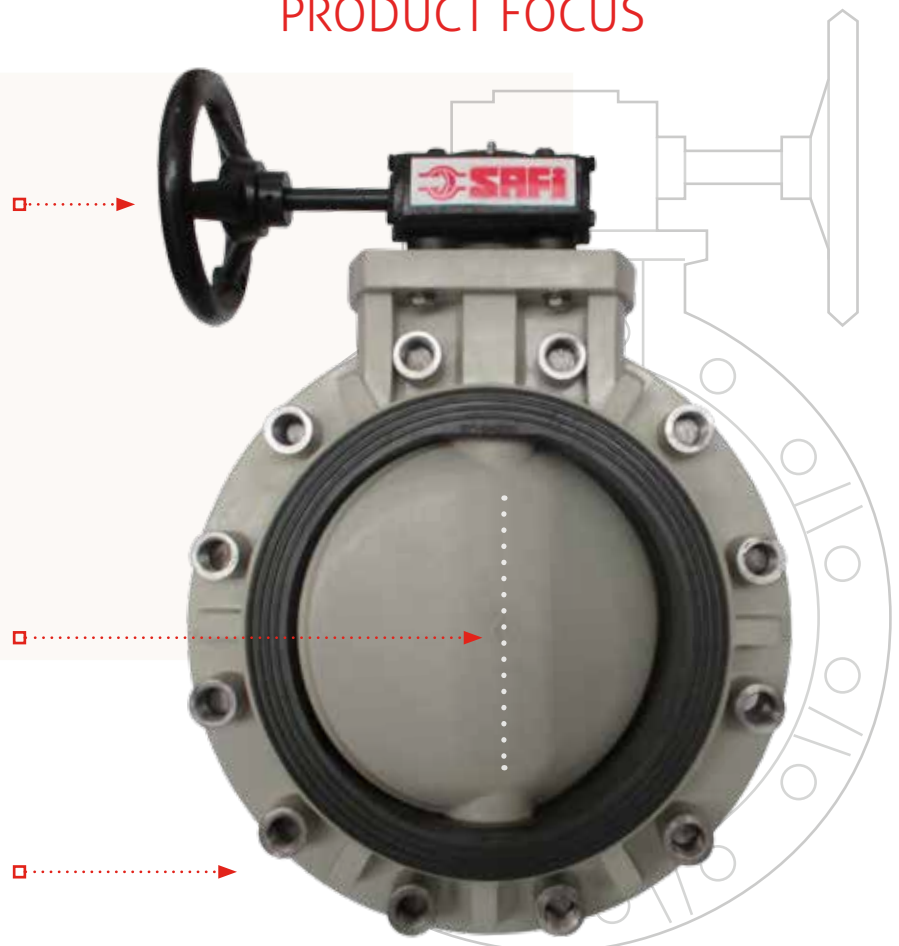


### PRODUCT FOCUS

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



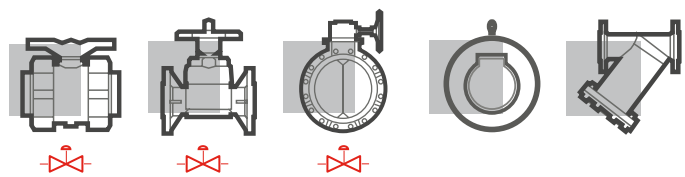
## Why THERMOPLASTIC in surface treatment ?

- 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



**PVDF actuated diaphragm valve**



### 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

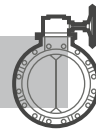
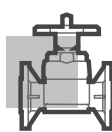
GRPP

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

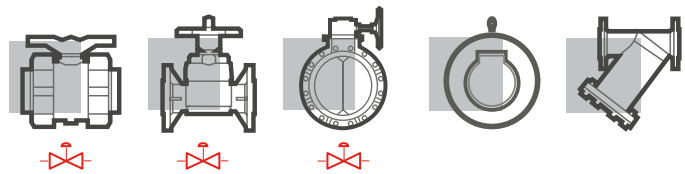
## Why THERMOPLASTIC in energy ?

- 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

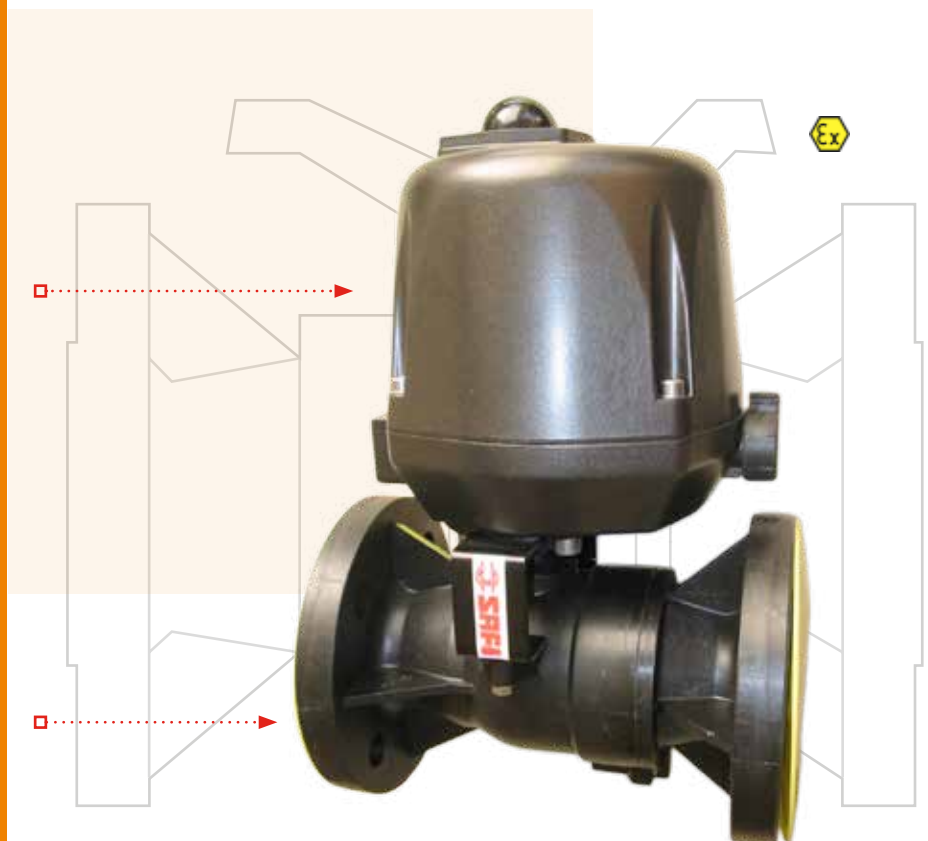
## Energy



## 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 ( $\text{H}_2\text{SO}_4$  96%)

## Why THERMOPLASTIC for OEM ?

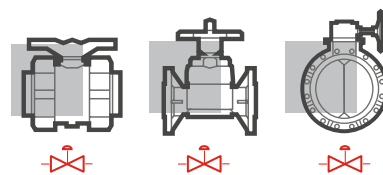
- o Excellent resistance to a wide range of chemical products
- o No external corrosion
- o Good resistance to abrasion
- o Light weight
- o Easy maintenance
- o High robustness

### 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 (dialysis skids)  
Bath and spa manufacturing  
Fountains manufacturers  
Material cleaning systems  
Crops sprayers  
Air flow control



Valve for ventilated pressurised suit



Crops sprayer modular valve



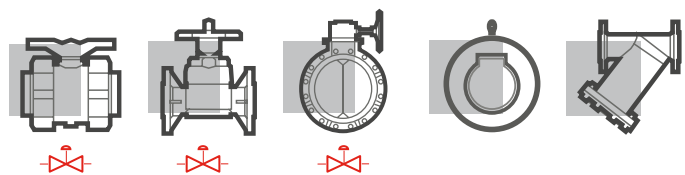
## Why THERMOPLASTIC in oil & gas & refineries ?

- 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

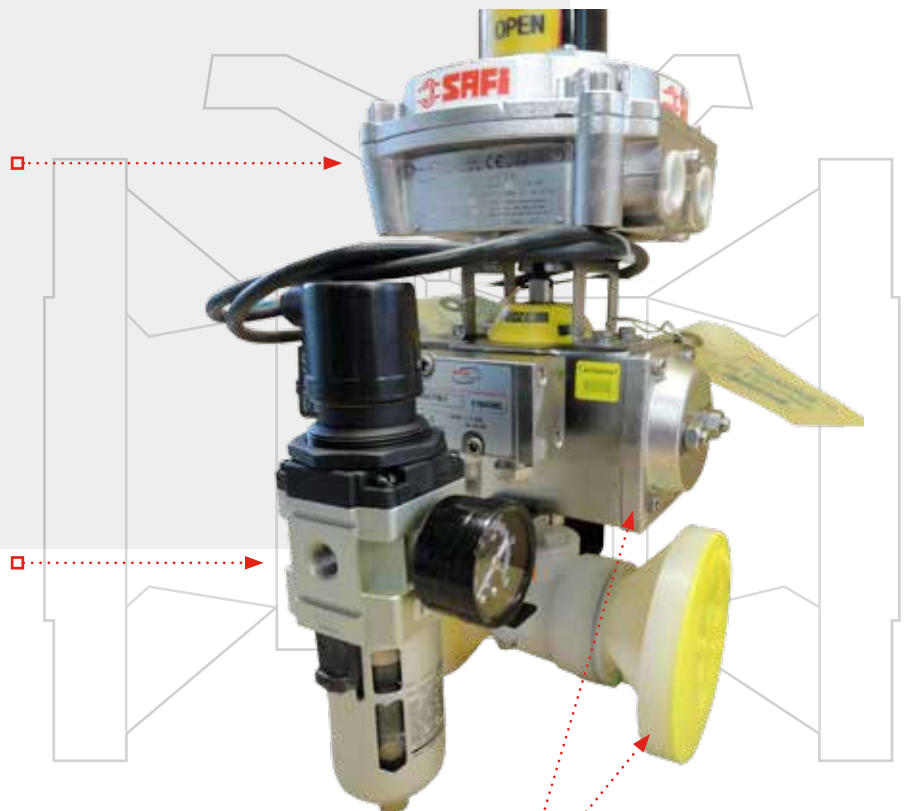


## PRODUCT FOCUS

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

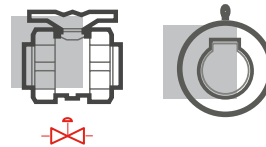
GRPP

PVDF

PPH

U-PVC

C-PVC

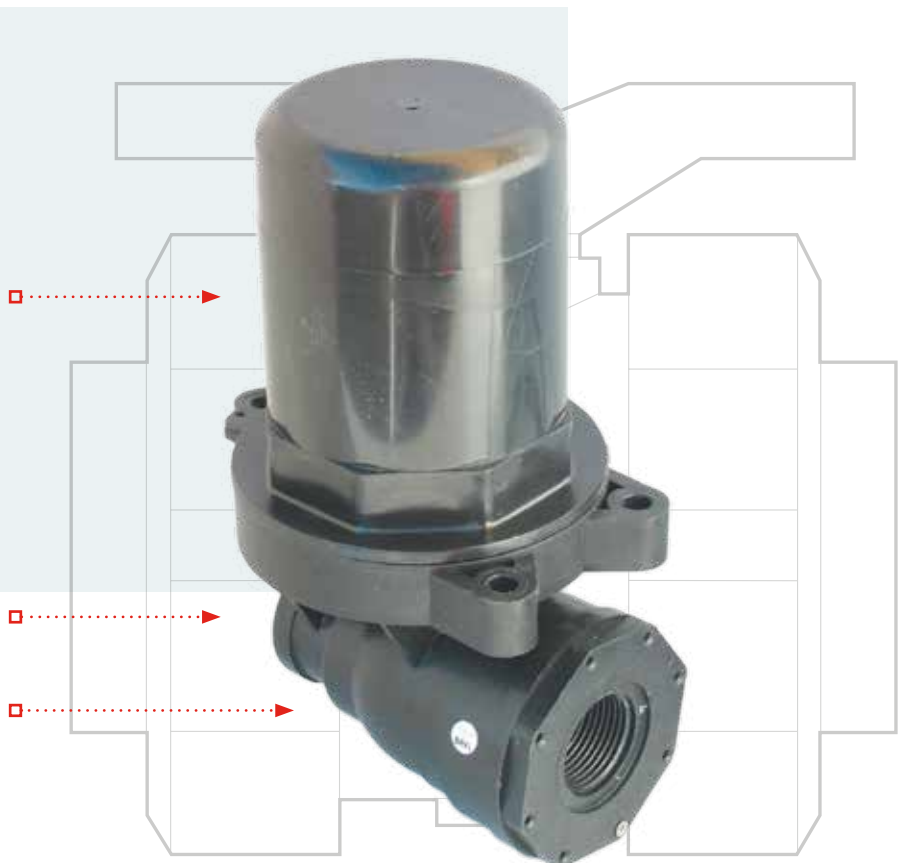


## PRODUCT FOCUS

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



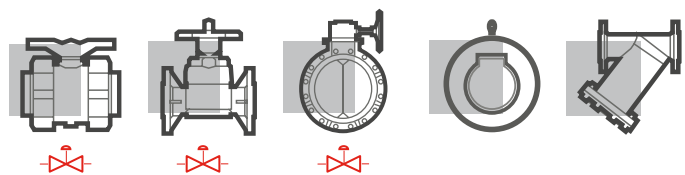
Bilge water system



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)





## Metal and lined metal valves replacement



### 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

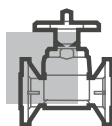
PVDF

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

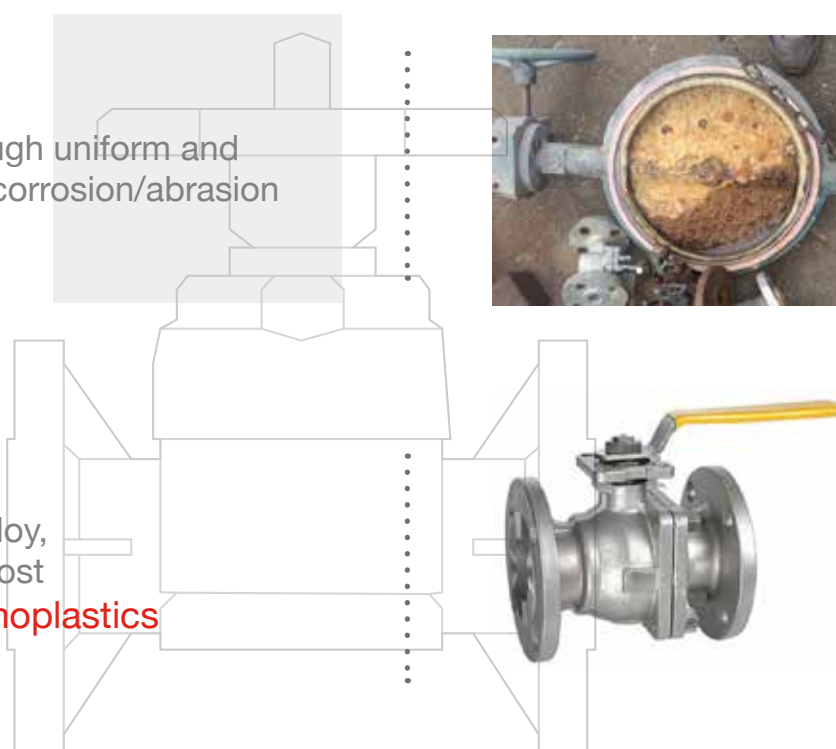
- o Metal valves **are replaced** by plastic valves when pressure and temperature are right



- 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



( $H_2SO_4$ , 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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