



Aliaxis

Chemical Industry

Solutions

www.fipnet.com



CONTENTS

VALVES AND FITTINGS MANUFACTURER SINCE 1954	01
CHEMICAL APPLICATIONS	
- Chemical industry solutions	02
- Chemical processing	04
- Hydrometallurgy	06
- Surface treatment	08
INDUSTRIAL WATER & WASTEWATER TREATMENT	10
CONVEYANCE OF CHEMICALS	11
STORAGE AND DISTRIBUTION OF CHEMICALS	12
MIXING AND DOSING	13
TRANSPORTATION AND REGENERATION OF ACIDS	14
OTHER USES OF FIP PRODUCTS IN THE CHEMICAL INDUSTRY	15
THERMOPLASTIC MATERIALS - KEY FEATURES	16
ADVANTAGES OF PLASTIC - BENEFITS OVER METAL PIPING	17
SYSTEM OVERVIEW - TECHNICAL DATA AND RANGE	
- Valves	18
- Pipes and Fittings	20
- Measurement and instrumentation	20
CASE HISTORY	
- SURFACE TREATMENT - Transportation of Acids	22
- PRODUCTION OF COPPER - Russia	23
ALIAxis WORLDWIDE	24

VALVES AND FITTINGS MANUFACTURER SINCE 1954



SOLUTIONS

FIP is a reliable supplier for the most conventional pressure pipeline systems such as water distribution systems, civil and industrial water treatment, irrigation, gardening, field and greenhouse farming, sports facilities, swimming pools, aqua parks, SPA and everywhere is required ease of installation, minimum maintenance and long life.

VERSATILITY

Global market challenge is to provide versatile products to be turned into reliable solutions, simple to install and use but effective to the needs of each application.

FIP develop products able to adapt to different conditions of use, featuring design, innovation, functionality, reliability and safety.



EVERYWHERE

We are constantly investing in R&D and process technologies to improve the products offer as well as the production efficiency; indeed FIP products, available in PVC-U, PP-H, PVC-C, PVDF are able to adapt to different conditions of use always providing additional smart features such as the customization system to clearly identify each valve of the plant!

KNOW-HOW

Since 1954 FIP produces injection molded valves and fittings in thermoplastic materials for pressure pipeline systems thus becoming nowadays a leading European valves manufacturer.

RESPONSIBILITY

FIP products are manufactured in EU production sites, operating in compliance to the Quality Assurance System ISO 9001 and with the Environmental Management System ISO 14001 standards requirements. We believe that environmental sustainability must be an important component of business practices at all stages of the product life cycle; since its foundation FIP takes care of people health and safety and it is committed to a sustainable use of natural resources and environment respect.

MOLDED IN FIP PRODUCTS
THERE ARE OVER 60 YEARS OF
EXPERIENCE AS WELL AS A STRONG
QUEST FOR INNOVATION



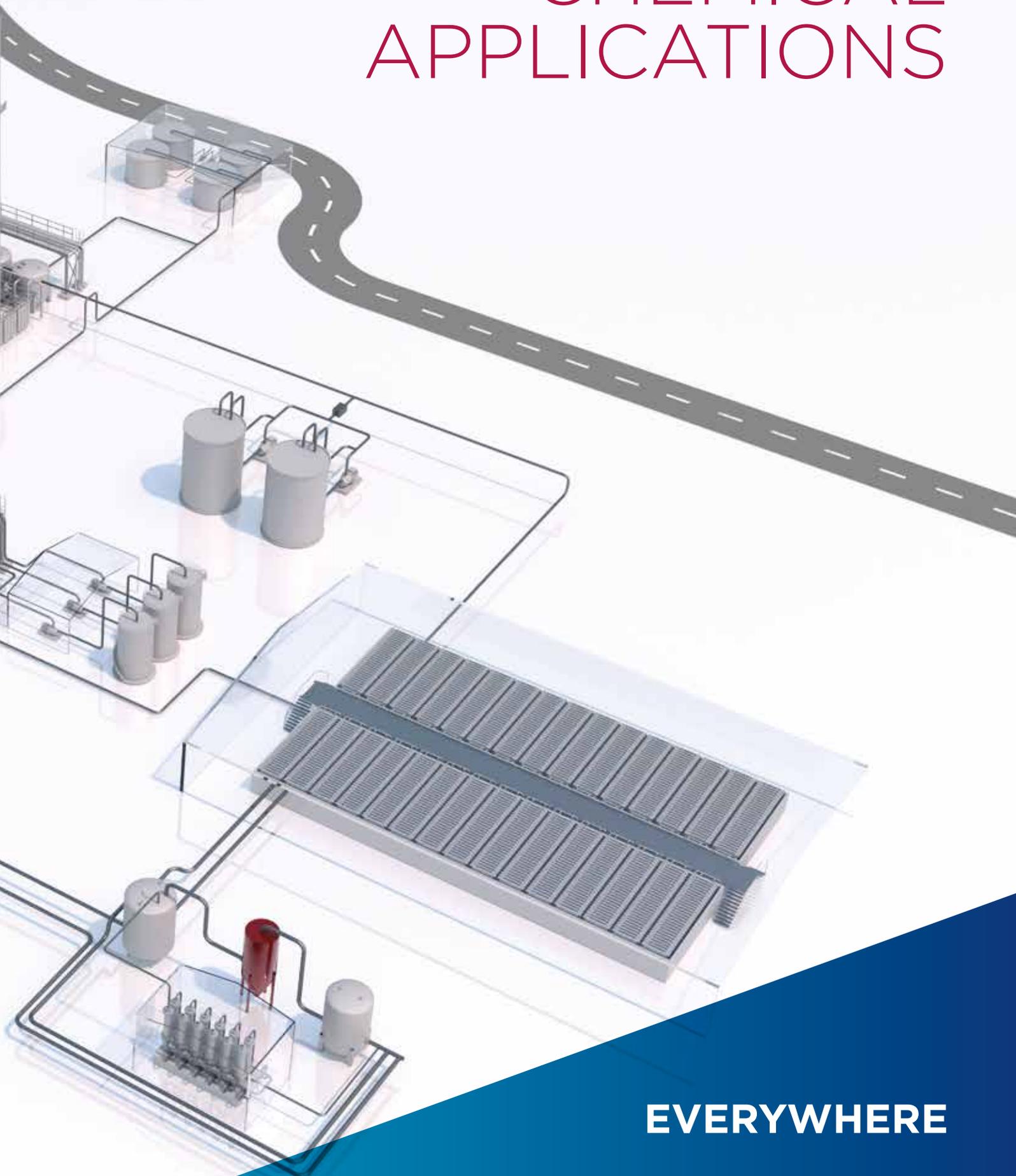
CHEMICAL INDUSTRY SOLUTIONS

During the last centuries, the chemical industry dramatically improved the daily life of everyone as well as the economy of the whole world. Chemical products are often essential components of industrial processes or are even sold as final products themselves.

Safety is getting more and more at the top of the priorities of the chemical industry. Many of the used products are hazardous both to the personnel and to the environment. Such chemical products may be solids, liquids or gases, flammable, explosive and are often corrosive to most materials.

FIP has decades of experience in manufacturing reliable plastic products in different materials, able to operate **everywhere** in the harsh and corrosive environments typical of the chemical industry and improve the safety of the working place and the environment protection.

CHEMICAL APPLICATIONS



EVERYWHERE



INDUSTRIAL WATER & WASTEWATER TREATMENT

MIXING AND DOSING

CHEMICAL PROCESSING

The chemical processing industry creates an immense variety of products, ranging from commodity/basic chemicals including fertilizers and chlorine produced in chlor-alkali plants to specialty chemicals like adhesives or pulp additives.

The chemical processing industry is now a globalized and highly competitive business. The continuous improvement of the performances, as well as the attention to the environment, to the health & safety of the personnel and to the plant security are a strong focus of all the players.

Efficiency, safety and reliability in a very aggressive environment, demand for the correct choice of material for every condition. FIP takes **responsibility** in supplying products that are manufactured with the highest standards of quality.

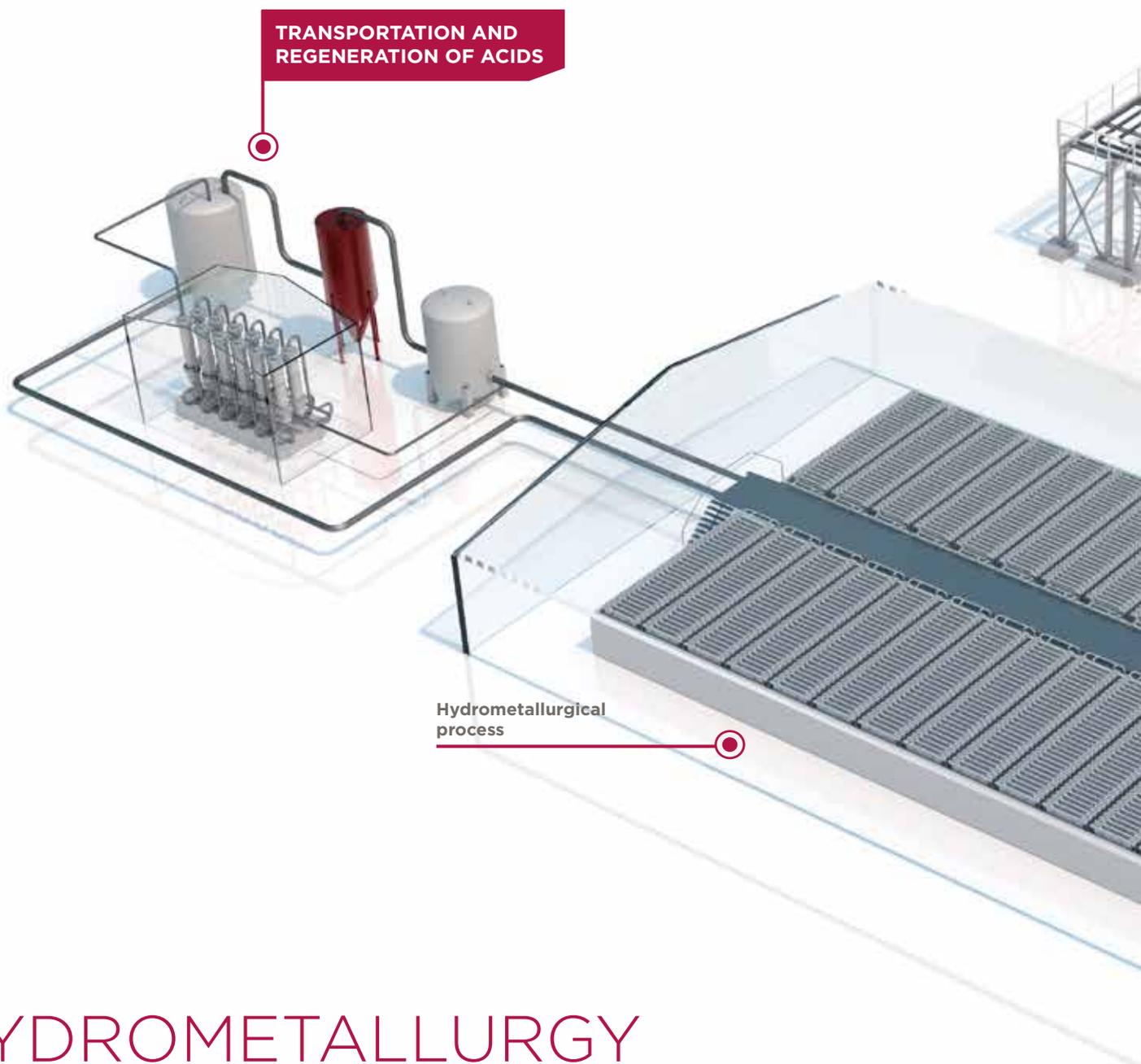


**CONVEYANCE
OF CHEMICALS**

**Processing
of chemicals**

**STORAGE AND
DISTRIBUTION
OF CHEMICALS**

RESPONSIBILITY



HYDROMETALLURGY

Hydrometallurgy is the final process of extracting metals from their ores; it involves dissolving the ore that has been crushed and concentrated into an aqueous phase and then recovering the metal from the liquor.

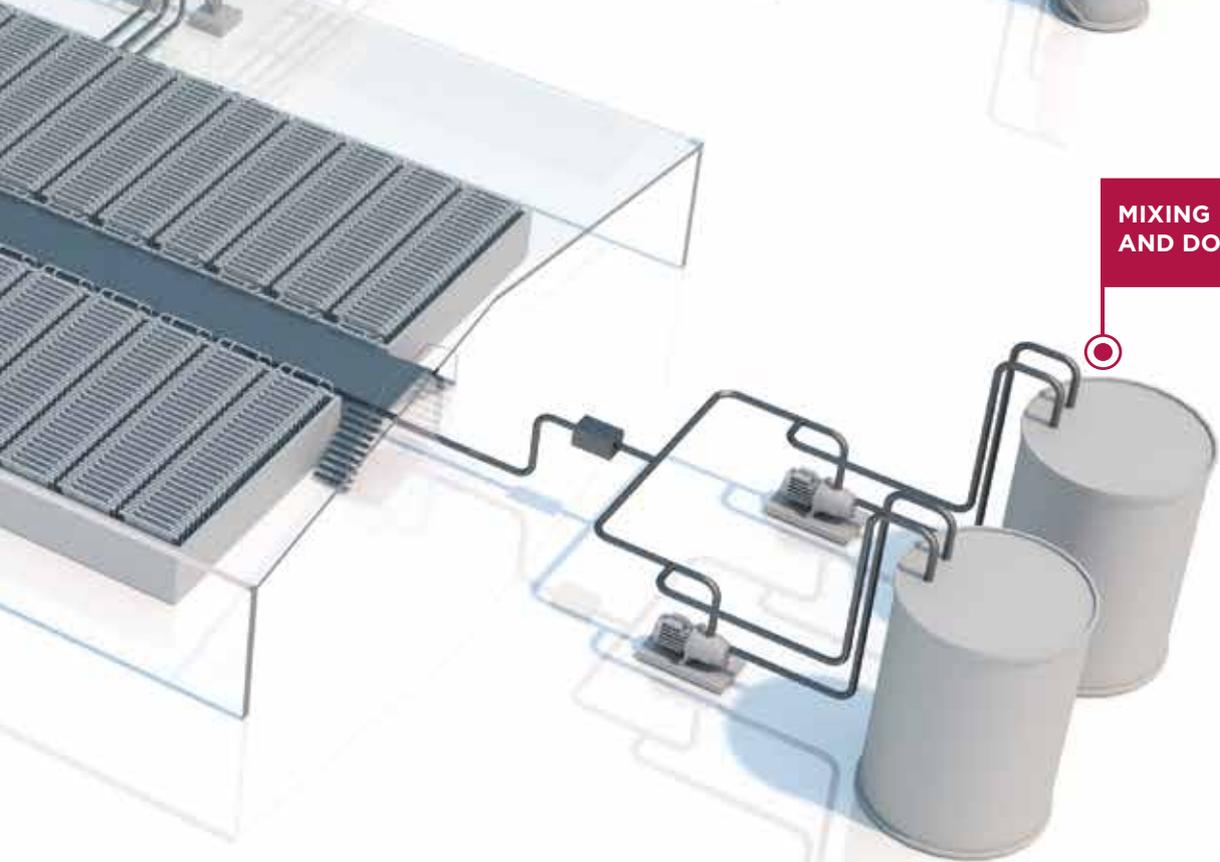
It plays an important role in the mining industry, compared to heat treatments these often represent a cost-effective and environmentally friendly way for extracting and concentrating different metals.

Among the most common application, heap leaching, solvent extraction, electrorefining and electrowinning are used to extract metals including copper, cobalt, nickel, zinc, gold and uranium. In these applications corrosion resistance and a cost effective solution for the conveyance of an high quantity of often slurry fluids is required.

FIP solutions, developed with a an extensive long term **know-how** ensure the advantageous characteristics of plastic materials, together with an optimized design for the best performance in each operating condition.

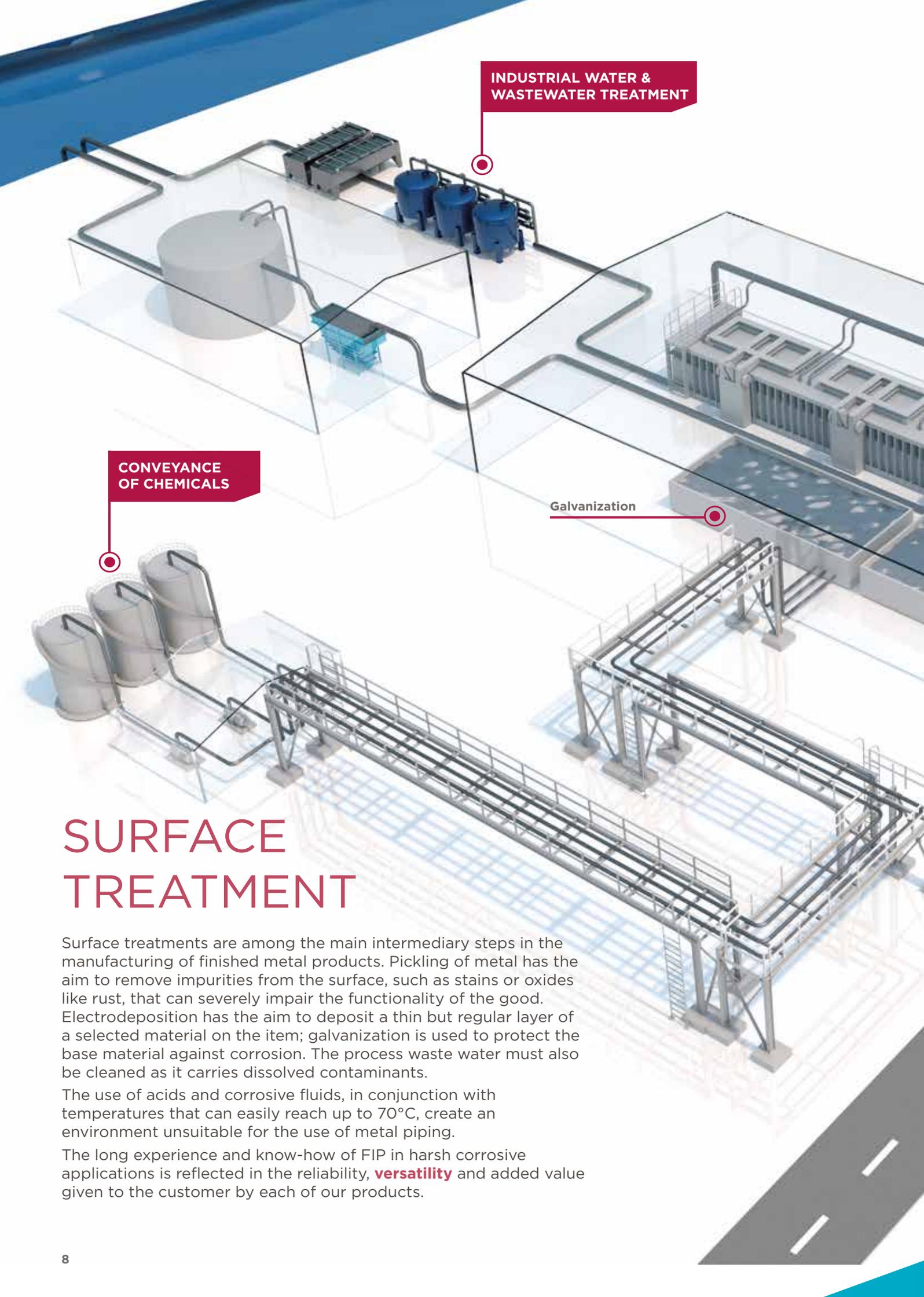


CONVEYANCE
OF CHEMICALS



MIXING
AND DOSING

KNOW-HOW



INDUSTRIAL WATER &
WASTEWATER TREATMENT

CONVEYANCE
OF CHEMICALS

Galvanization

SURFACE TREATMENT

Surface treatments are among the main intermediary steps in the manufacturing of finished metal products. Pickling of metal has the aim to remove impurities from the surface, such as stains or oxides like rust, that can severely impair the functionality of the good. Electrodeposition has the aim to deposit a thin but regular layer of a selected material on the item; galvanization is used to protect the base material against corrosion. The process waste water must also be cleaned as it carries dissolved contaminants.

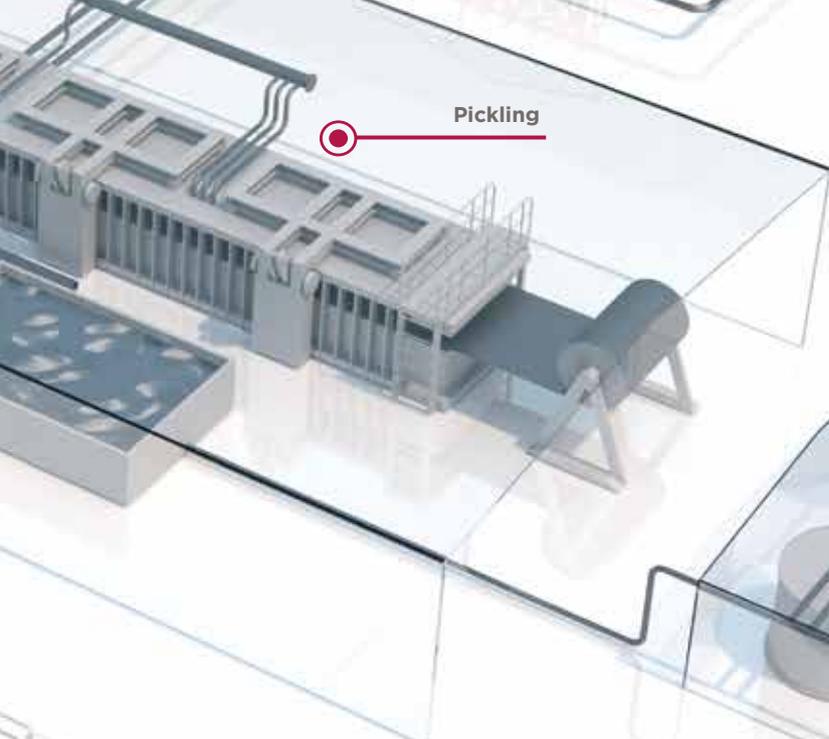
The use of acids and corrosive fluids, in conjunction with temperatures that can easily reach up to 70°C, create an environment unsuitable for the use of metal piping.

The long experience and know-how of FIP in harsh corrosive applications is reflected in the reliability, **versatility** and added value given to the customer by each of our products.

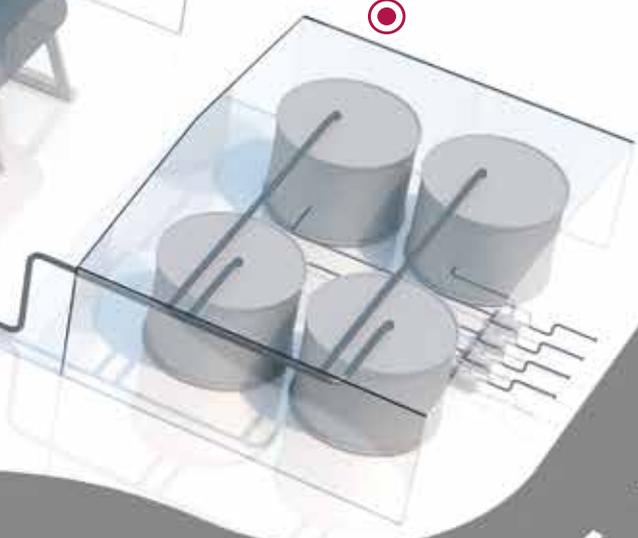
**TRANSPORTATION AND
REGENERATION OF ACIDS**



Pickling



**STORAGE AND
DISTRIBUTION
OF CHEMICALS**



VERSATILITY

INDUSTRIAL WATER & WASTEWATER TREATMENT

Industrial water treatment is emerging as one of the main topics in several industries, including the chemical industry. On the other side of the process, wastewater must be treated to comply with the more and more stringent environmental regulations or to be reused in the production with a zero liquid discharge process.

Depending on the required final level of purity, different water treatment technologies may be used, mainly flocculation, reverse osmosis, filtration or ion exchange.

FIP constantly invests to respect the most stringent quality standards and meet the various needs of the users according to the specific application requirements.

FIP KEY PRODUCTS

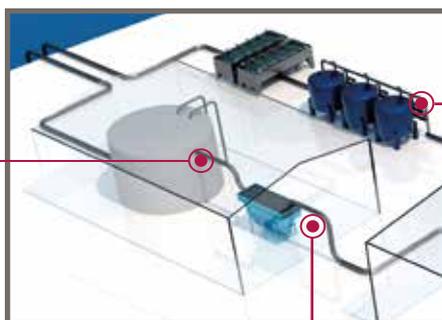


SXE/SSE

Easyfit true union ball check valve

Main features

- Vertical and horizontal installation potential
- High surface finish ball shutter to grant a reduced valve maintenance.
- SXE is ideal for conveying dirty fluids, even with suspended solids and filaments thanks to the self-cleaning design; no metal parts in contact with the fluid
- SSE can be installed when no backpressure is available
- Customisable Labelling System on the body to identify the valve on the system according to specific needs



M9.07

Dual-parameter conductivity and flow monitor & transmitter



Main features

- Wide full graphic display
- Multicolor backlight
- Help on board
- Simultaneous measurement of conductivity, temperature and flow
- Fast and intuitive calibration software
- Mechanical relay for external device control
- Solid State Relays for programmable alarms
- Multilanguage menu



VKD

VKD DUAL BLOCK® ball valve

Main features

- DUAL BLOCK® patented union nut locking system to increase system safety by avoiding leakages caused by the unscrewing of the nuts
- SEAT STOP® ball carrier system that allows micro-adjustments of the ball seats, guarantees optimal operability and increases the service life
- SHKD accessory allows the valve to be closed with a padlock for Lock Out Tag Out procedures
- Ergonomic HIPVC handle equipped with removable tool to adjust the ball seat carrier.
- Robust integrated brackets for valve anchoring

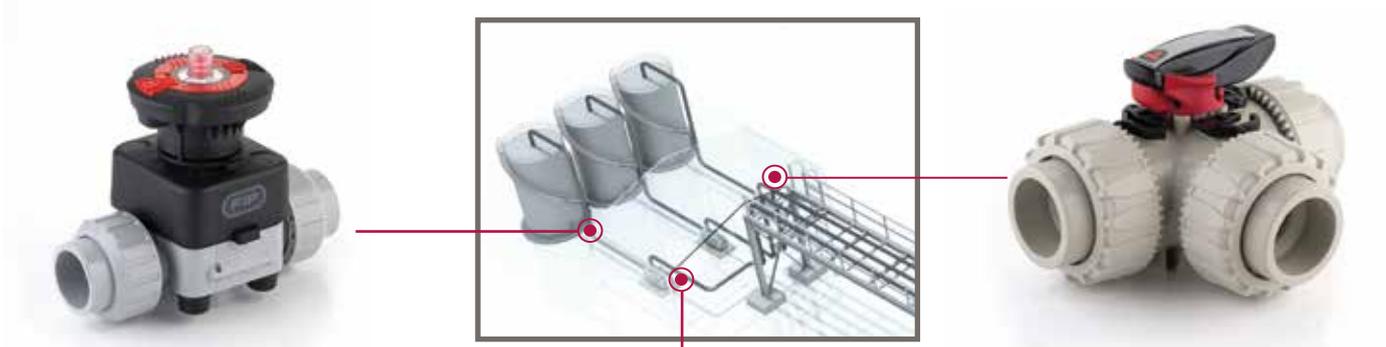
FIP SYSTEM FOR INDUSTRIAL WATER & WASTEWATER TREATMENT

Ball valves	Butterfly valves	Diaphragm valves	Check valve	Pipes & fittings	pH/temperature monitoring	Flow monitoring	Conductivity/temperature monitoring	Variable area flowmeter
VXE	FK	DK	SXE	PVC-U	PH 660	F6.60	C6.30	FS
VKD	FK/CE-CP	VM	SSE	PVC-C	PH 870	F6.30	C150-200	FC
VKR		DK/CP	VR	PP-H	PH 222	F3.00		
TKD		VM/CP		PE		F3.80		
VKD/CE-CP						ULF		
VKR/CE					M9.06		M9.07	
TKD/CE-CP					M9.08		M9.05	

CONVEYANCE OF CHEMICALS

A safe and efficient conveyance of the acids and chemicals involved in each industrial process is a “conditio sine qua non” for every industry where they are involved. Plastic materials are ideally suited for the conveyance of combinations of aggressive chemicals. Depending on the medium to be transported, the plastic materials manufactured by FIP offer the best solution for a wide range of chemicals and acids. The complete offer in terms of pipes, fittings, manual and actuated valves and sensors allow a precise and reliable conveyance of fluids in every corrosive environment.

FIP KEY PRODUCTS



DK

DIALOCK® diaphragm valve

Main features

- Dialock® system: innovative handwheel with a patented locking device that allows it to be blocked and locked in over 300 positions.
- Possibility to be closed with a padlock for Lock Out Tag Out procedures
- New body design for higher flow coefficient
- Ergonomic hand wheel and bonnet in PP-GR with PVC cap (excellent chemical resistance)
- DKL version with integrated Stroke limiter and Travel stop
- Customisation plate and TAG ready, integrated bracket for valve anchoring



F6.30

Paddlewheel flow transmitter

Main features

- High chemical resistance
- Large pipe size range: from DN15 (0.5”) up to DN600 (24”)
- Low pressure drop
- User friendly calibration procedure
- 4-20 mA, volumetric pulse frequency output is adjustable by USB
- SSR can be set as alarm by PC

TKD

DUAL BLOCK® 3-way ball valve

Main features

- DUAL BLOCK® patented union nut locking system to increase system safety by avoiding leakages caused by the unscrewing of the nuts
- SEAT STOP® ball carrier system with 4 PTFE supports to guarantee optimal operability and long working life.
- SHKD accessory allows the valve to be closed with a padlock for Lock Out Tag Out procedures
- Available with “L” or “T” shaped ball ports. LTKD 90° degrees stroke limiter is available as an option
- Robust integrated brackets for valve anchoring

FIP SYSTEM FOR CONVEYANCE OF CHEMICALS

Ball valves	Butterfly valves	Diaphragm valves	Check valve	Pipes & fittings	Flow monitoring	Variable area flowmeter
VKD	FK	DK	SXE	PVC-U	F6.60	FS
VKR	FK/CP	VM	SSE	PVC-C	F6.30	FC
TKD		DK/CP	VR	PP-H	F3.00	
VKD/CP		VM/CP	SR	PVDF	M9.02	
		CM/CP	FR	PE	M9.03	
		VV				

STORAGE AND DISTRIBUTION OF CHEMICALS

The necessity to store and transport several chemical compounds is a common requirement of many facilities. A typical example may be the transportation from the draw-off stations where the chemicals are received to the storage tanks and from there to the point where they are needed in the process. The chemical compatibility of the piping must be ensured to avoid environmental and safety risks, as well as to minimize maintenance costs. FIP can supply a complete package of pipes, fittings and valves for the safe and reliable transportation of several fluids.

FIP KEY PRODUCTS

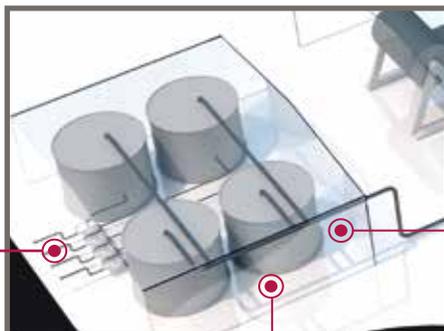


FK

Butterfly valve

Main features

- Ergonomic HIPVC handle with customization plate and locking device that allows it to be blocked and locked in 10 positions. Possibility to be closed with a padlock for Lock Out Tag Out procedures
- Available in wafer and lug version with co-moulded stainless steel inserts
- Valve body in PP-GR resistant to UV rays and corrosion; completely isolated from the fluid
- Valve disc in PVC-U, PVC-C, PP-H or PVDF, stainless steel stem completely isolated from the fluid
- Available with manual handle or handwheel



M9.10 (flow + pressure/level)

Dual-parameter analogic monitor & transmitter



Main features

- Wide full graphic display
- Multicolor backlight
- Help on board
- Simultaneous visualization of two parameters
- Free setting of engineering unit
- Fast and intuitive calibration software
- In-line adjustment
- Able to handle active and passive analogic signals



DK/CP

Pneumatically actuated diaphragm valve

Main features

- New body design for higher flow coefficient
- High visibility optical position indicator
- Light and compact piston type actuator in PP-GR, resistant to UV rays and corrosion; completely isolated from the fluid.
- Threaded actuation air inlets can be rotated at 90°
- Long lifetime without maintenance ensured by the actuator design and the floating pin connection between the actuator stem and diaphragm.
- Customisation plate and TAG ready, integrated bracket for valve anchoring

FIP SYSTEM FOR STORAGE AND DISTRIBUTION OF CHEMICALS

Ball valves	Butterfly valves	Diaphragm valves	Check valve	Pipes & fittings	pH/ temperature monitoring	Flow monitoring	Pressure/ Level monitoring	Conductivity/ temperature monitoring	Variable area flowmeter
VKD	FK	DK	SXE	PVC-U	PH 660	F6.60	HF6	C6.30	FS
TKD	FK/CE-CP	VM	SSE	PVC-C	PH 870	F6.30		C150-200	FC
VKD/CE-CP		DK/CP	VR	PP-H	PH 222	F3.00		C100-300	
		VM/CP	SR	PVDF		F3.80			
			FR	PE		ULF			
			VA		M9.06	M9.02		M9.05	
			VZ		M9.08				
						M9.10			

MIXING AND DOSING

The increasing need to have full control of each parameter in the production comes along with the more and more advanced industrial processes. This is particularly true when aggressive chemicals are involved in potentially hazardous operations. FIP offers a wide range of manual and actuated valves, sensors and monitors that have been designed for the fine regulation of fluids and are suitable for the mixing, dosing and measurement of the desired amount or mix of each chemical.

FIP KEY PRODUCTS

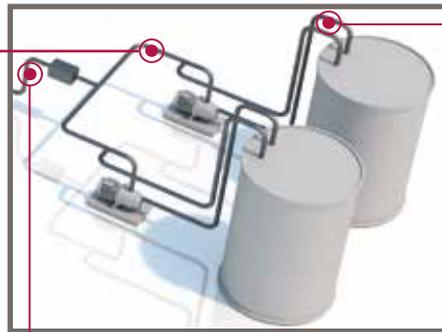


VKR

DUAL BLOCK® regulating ball valve

Main features

- Patented ball design to provide linear flow adjustment throughout its range of operation even when the valve is open just a few degrees, including SEAT STOP® ball carrier system
- DUAL BLOCK® patented union nut locking system to increase system safety by avoiding leakages caused by the unscrewing of the nuts
- Flow direction and opening angle indication plate with 5° resolution graduated scale for clear and accurate reading
- Robust integrated brackets for valve anchoring
- Ergonomic HIPVC handle equipped with removable tool to adjust the ball seat carrier.



PH 600

PVC-C body flat surface electrode

Main features

- Double junction technology
- High protection from process contamination
- Easy and quick installation system
- BNC connector
- Submersion or hot tap installation
- Low cost fittings



VKD/CE

Electrically actuated VKD DUAL BLOCK® ball valve

Main features

- DUAL BLOCK® patented union nut locking system to increase system safety by avoiding leakages caused by the unscrewing of the nuts
- SEAT STOP® ball carrier system that allows micro-adjustments of the ball seats, guarantees optimal operability and increases the service life
- Thermoplastic case to prevent corrosion; IP66 protection class
- AC and DC power input. ON/OFF or modulating functions. Position transmitter, feedback potentiometer and positioner available as accessories
- Manual override as standard; availability of a wide range of accessories
- Robust integrated brackets for valve anchoring

FIP SYSTEM FOR MIXING AND DOSING

Ball valves	Butterfly valves	Diaphragm valves	Check valve	Pressure control valves	pH/temperature monitoring	Flow monitoring	Conductivity/temperature monitoring	Pressure/Level monitoring	Variable area flowmeter
VXE	FK	DK	SXE	VCP	PH 660	F6.60	C6.30	HF6	FS
VKD	FK/CE-CP	DK/CP	SSE	VSF	PH 870	F6.30	C150-200		FC
VKR		CM	VR	SV	PH 222	F3.00	C100-300		
TKD		CM/CP	SR		M9.06	F3.80	M9.05		
VKD/CE-CP		VV				ULF			
VKR/CE					M9.08				
TKD/CE-CP						M9.07			
						M9.02			
						M9.10		M9.10	

TRANSPORTATION AND REGENERATION OF ACIDS

Often acids are used to selectively dissolve organic or inorganic substances; this may be done because the presence of such components is unwanted (e.g. pickling) or because such components are needed in a subsequent process (e.g. solvent extraction). Among the most commonly employed are sulfuric acid, hydrochloric acid and nitric acid in different concentrations and mix.

The process acids are required to be transported from the storages to the main process location and often to the regeneration circuit, where the metal particles are separated from the acids. Plastic piping offers an efficient, well-proven and safe way to convey the most commonly employed acids.

FIP KEY PRODUCTS

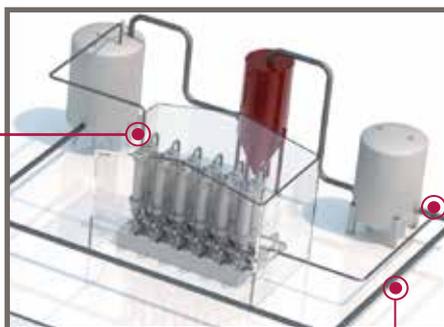


DK FLANGED BODY

DIALOCK® diaphragm valve with moulded one-piece flanged body

Main features

- New body design with one-piece flanged body in solid thermoplastic material and designed for higher flow coefficient
- Fixed flanges in thermoplastic material without welded or cemented parts
- Dialock® system: innovative handwheel with a patented locking device that allows it to be blocked and locked in over 300 positions.
- Possibility to be closed with a padlock for Lock Out Tag Out procedures
- Ergonomic hand wheel and bonnet in PP-GR with PVC cap (excellent chemical resistance)
- Customisation plate and TAG ready, integrated bracket for valve anchoring



PH870 AND M9.08

Dual-parameter pH/ORP and flow monitor



Main features

- Wide full graphic display
- Multicolor backlight
- Help on board
- Simultaneous measurement of pH/ORP and flow
- Fast and intuitive calibration procedures
- Mechanical relay for external device control
- Solid State Relays for programmable alarms
- Multilanguage menu



FK/CP

Pneumatically actuated butterfly valve

Main features

- Pneumatic actuator selected by FIP according to its requirements of quality and reliability.
- Normally Closed (Fail Close), Normally Open (Fail Open) or Double Acting.
- Valve body in PP-GR resistant to UV rays and corrosion; completely isolated from the fluid
- Valve disc in PVC-U, PVC-C, PP-H or PVDF, stainless steel stem completely isolated from the fluid
- Available in wafer and lug version with co-moulded stainless steel inserts
- Actuator coating in anodized aluminium, available also in stainless steel and ptfе coating

FIP SYSTEM FOR TRANSPORTATION AND REGENERATION OF ACIDS

Ball valves	Butterfly valves	Diaphragm valves	Check valve	Pipes & fittings	pH/temperature monitoring	Flow monitoring	Variable area flowmeter
VKD	FK	DK	SXE	PVC-U	PH 660	F6.60	FS
VKR	FK/CP	VM	SSE	PVC-C	PH 870	F6.30	FC
TKD		DK/CP	VR	PP-H	PH 222	F3.00	
VKD/CP		VM/CP	SR	PVDF		F3.80	
			FR	PE		ULF	
					M9.08		
					M9.06	M9.02	

OTHER USES OF FIP PRODUCTS IN THE CHEMICAL INDUSTRY



FLUE GAS TREATMENT

Exhaust gases, especially from combustion processes, must be treated to reduce pollutants in order to comply with the increasingly stringent environmental regulations. Flue gases are usually introduced in gas scrubbers where chemical or physical deposition takes place. Liquids like water, limestone or urea are introduced or sprayed in the vessel to absorb the pollutants.

FIP plastic systems provide the suitable solution for pressurized liquids and gas transportation in such corrosive environment.



FILLING OF ACIDS FOR AUTOMOTIVE BATTERIES

The technological improvement of the automotive industry is pushing forward the vehicle automatization and its demand for electrical energy. To fulfil such requirements the batteries technology is evolving at a fast rate. FIP plastic components are the perfect choice to realize an highly efficient and reliable equipment to transport and control the corrosive media employed in the production of batteries.



MEMBRANE FILTRATION

Membrane filtration is increasingly used for removal of bacteria, microorganisms, particulates and natural organic material. Microfiltration (MF), Ultrafiltration (UF), Nano filtration (NF) and Reverse Osmosis (RO) are the most used membrane filtration in municipal and industrial water treatment plants with different kinds of pore sizes and pressures. Reverse osmosis, commonly known for its use in potable water from seawater, can effectively remove under high pressure all inorganic contaminants. FIP studies and develops dedicated valves and instruments for potable water treatments.



DISINFECTION AND pH ADJUSTMENT

pH adjustment is very important in most industrial processes where wastewater has to follow environmental policies and specifications before being reused or returned to the water cycle. If the water is acidic, lower than 7, lime, sodium carbonate or sodium hydroxide are added to raise the pH, while when pH is too high, weak solutions of hydrochloric acid or sulfuric acid are necessary to lower it. FIP can supply a highly qualified range of solutions and offer a wide range of products for disinfection and pH adjustment systems according to your requirements.

THERMOPLASTIC MATERIALS

KEY FEATURES

PVC-U

Developed in 1930 in Germany, PVC-U (rigid polyvinyl chloride -unplasticized) is obtained through the polymerization of a vinyl chloride monomer. The presence of chlorine in the PVC-U molecule results in a high performance resin, in terms of thermal stability and chemical and mechanical resistance, up to temperatures of 60° C.



Material	PVC-U Unplasticized Polyvinyl Chloride
Coupling standards	Solvent welding
Range	from DN10 to DN500
Working Pressure classes	up to PN16
Working temperature range	From 0 °C to 60 °C

PVC-C

Developed in 1958 by the company BF Goodrich, now LUBRIZOL, PVC-C (post-chlorinated polyvinyl chloride) is obtained by chlorinating the PVC resin in suspension. During the transformation, alternate hydrogen atom monomers in the PVC molecular chain are replaced by chlorine atoms. The process produces a high performance resin with excellent thermal stability, chemical and mechanical strength up to temperatures of 100°C.



Material	PVC-C Chlorinated Polyvinylchloride, made of CORZAN® resin only
Coupling standards	Solvent welding
Range	from DN10 to DN300
Working Pressure classes	up to PN16
Working temperature range	From 0 °C to 100 °C

PP-H

Polypropylene is a thermoplastic and partially crystalline resin belonging to the family of polyolefins. PP is obtained through the polymerization of propylene (C₃H₆) with the aid of catalysts. For use in piping systems, the latest-generation Polypropylene Homopolymer variant, or PP-H, offers excellent performance at working temperatures of up to 100° C and a high resistance to chemicals due to the excellent physical and thermal characteristics of the resin.



Material	PP-H (100) Polypropylene homopolymer
Coupling standards	Socket and butt welding
Range	from DN10 to DN400
Working Pressure classes	up to PN10
Working temperature range	From 0°C to 100°C

PE

Polyethylene is a polyolefin, which forms a separate group among the semi-crystalline thermoplastics. Polyethylene, abbreviated PE, is an umbrella term for a group on individually distinctive PE types. PE-HD has a high density with an average density between 0.94-0.965 g/cm³. The use of PE100 (density 0.958 g/ cm³), due to its greater strength, is increasingly more common in pipe construction, especially in areas involving high pressure.



Material	PE100 Polyethylene high density
Coupling standards	Butt welding and electrofusion
Range	from DN10 to DN1000
Working Pressure classes	up to PN16
Working temperature range	From -40 °C to 60 °C

PVDF

PVDF (polyvinylidene difluoride) is a fluorinated and semicrystalline technopolymer containing 59% of its weight in fluorine. This material is obtained through the polymerization of vinylidene fluoride. It boasts exceptional mechanical, physical and chemical resistance, guaranteeing excellent thermal stability up to 140° C.



Material	PVDF Polyvinylidene Fluoride - Compound Solef®
Coupling standards	Socket welding
Range	from DN10 to DN400
Working Pressure classes	up to PN16
Working temperature range	From -40 °C to 140 °C

The success of thermoplastic materials, together with the ease of installation, the minimum maintenance and long life, has brought them even in most conventional pressure pipeline systems such as Water and Wastewater treatment plants.

ADVANTAGES OF PLASTIC BENEFITS OVER METAL PIPING

Plastic material components have several advantages in the chemical industry in comparison to the same components in metallic materials. Among the main advantages:

- The chemical resistance in corrosive environments and absence of electro-chemical corrosion processes allow a long life service, safety and reliability and time of the plant
- Ease of installation, lowering the construction cost of the system
- The supply cost is usually lower than the same metal piping system
- The carbon footprint due to the energy consumed for the production and disposal of a plastic component is usually lower than that of the same item in metal
- Low thermal conductivity, minimizing heat losses and thus the energy consumption to have the temperature required by the process
- The high smoothness of plastic reduces friction losses for the fluid transportation, lowering the pumps energy consumption
- Low weight, ensuring reduced costs and carbon footprint for the transportation of the components



Such benefits, allow the final user selecting a plastic piping system to:

- Minimize the system total cost of ownership both in terms of Capex and Opex;
- Get the highest safety of the system;
- Maximize the efficiency of the whole process;
- Reduce the environmental impact both in terms of construction and operation emissions

SYSTEM OVERVIEW

TECHNICAL DATA AND RANGE

VALVES			
Product group	Type	Range	Description
Ball valves	VKD	DN 10÷100	Industrial ball valve
	VKD/CE	DN 10÷100	Industrial ball valve with electric actuator
	VKD/CP	DN 10÷100	Industrial ball valve with pneumatic actuator
	VKR	DN 10÷50	Regulating ball valve
	VKR/CE	DN 10÷50	Regulating ball valve with modulating electric actuator
	TKD	DN 10÷50	Three way Industrial ball valve
	TKD/CE	DN 10÷50	Three way Industrial ball valve with electric actuator
	TKD/CP	DN 10÷50	Three way Industrial ball valve with pneumatic actuator
	VXE	DN 10÷100	Two way universal ball valve
	VXE/CE	DN 65÷100	Two way Universal ball valve with electric actuator
	VXE/CP	DN 65÷100	Two way Universal ball valve with pneumatic actuator
VEE	DN 10÷100	Two way Water ball valve	
Butterfly valves	FK	DN 40÷400	Industrial butterfly valve
	FK/CE	DN 40÷400	Industrial butterfly valve with electric actuator
	FK/CP	DN 40÷400	Industrial butterfly valve with pneumatic actuator
	FE	DN 40÷200	Water butterfly valve
	FE/CE	DN 40÷200	Water butterfly valve with electric actuator
	FE/CP	DN 40÷200	Water butterfly valve with pneumatic actuator
Diaphragm valves	DK	DN 15÷65	Diaphragm valve
	DK/CP	DN 15÷65	Diaphragm valve with pneumatic actuator
	VM	DN 80÷100	Diaphragm valve
	VM/CP	DN 80÷100	Diaphragm valve with pneumatic actuator diaphragm type
	CM	DN 12÷15	Compact diaphragm valve
	CM/CP	DN 12÷15	Compact diaphragm valve with pneumatic actuator piston type
Check valves	SR	DN 15÷50	Ball check valve
	SXE	DN 10÷100	True union ball check valve
	SSE	DN 10÷100	True union spring check valve
	CR	DN 40÷300	Wafer check valve
	VR	DN 10÷100	Angle seat check valve
	FR	DN 32÷300	Wafer check valve
Pressure control valves	SV	DN 15÷25	Angle seat relief valve
	VSF	DN 10÷100	Diaphragm relief valve
	VCP	DN 10÷100	Diaphragm back valve
	VPR	DN 10÷100	Pressure reducing valve
Ancillary valves	RV	DN 10÷100	Sediment strainer
	VV	DN 10÷50	Angle seat valve
	VA	DN 10÷50	Air release valve
	VZ	DN 10÷50	Foot valve

PN: nominal pressure with water at 20 °C

Actuation			PVC-U	PVC-C	PP-H	PVDF
Manual			PN 16	PN 16	PN 10	PN 16
	Electric		up to PN 16	up to PN 16	PN 10	up to PN 16
		Pneumatic	up to PN 16	up to PN 16	PN 10	up to PN 16
Manual			PN 16		PN 10	PN 16
	Electric		up to PN 16		PN 10	up to PN 16
Manual			PN 16	PN 16	PN 10	
	Electric		up to PN 16	up to PN 16	PN 10	
		Pneumatic	PN 16	PN 16	PN 10	
Manual			PN 16	PN 16		
	Electric		up to PN 10	up to PN 10		
		Pneumatic	up to PN 6	up to PN 6		
Manual			PN 16			
Manual			up to PN 16	up to PN 16	up to PN 10	up to PN 16
	Electric		up to PN 16	up to PN 16	up to PN 10	up to PN 16
		Pneumatic	up to PN 16	up to PN 16	up to PN 10	up to PN 16
Manual			up to PN 16			
	Electric		up to PN 16			
		Pneumatic	up to PN 16			
Manual			PN 10	PN 10	PN 10	PN 10
		Pneumatic	PN 10	PN 10	PN 10	PN 10
Manual			up to PN 10	up to PN 10	up to PN 10	up to PN 10
		Pneumatic	up to PN 6	up to PN 6	up to PN 6	up to PN 6
Hand			PN 6	PN 6	PN 6	PN 6
		Pneumatic	PN 6	PN 6	PN 6	PN 6
	Self				PN 10	PN 16
	Self		PN 16	PN 16		
	Self		PN 16			
	Self		PN 5			
	Self		up to PN 16		up to PN 10	
	Self		PN 6		PN 6	PN 6
	Self		PN 16			
	Self		up to PN 10		up to PN 10	up to PN 10
	Self		up to PN 10		up to PN 10	up to PN 10
	Self				up to PN 10	up to PN 10
	-		up to PN 16	PN 16 DN 10-50	up to PN 10	
Manual			up to PN 16			
	Self		PN 16			
	Self		PN 16			

SYSTEM OVERVIEW

TECHNICAL DATA AND RANGE

PIPES AND FITTINGS	
Product group	Description
Fittings	Solvent Welding ISO-DIN standard
	Adaptor fittings Solvent Welding/Threaded ISO-UNI/BSP standard
	Solvent Welding BS Imperial standard
	Socket Welding ISO-UNI Standard
	Adaptor fittings Socket Welding/Threaded ISO-UNI/BSP Standard
	Butt Welding ISO-UNI Standard
	Adaptor fittings Butt Welding/Threaded ISO-UNI/BSP Standard
Pipe	Solvent, Butt and Socket Welding ISO-DIN Standard

MEASUREMENT AND INSTRUMENTATION				
Product group	type	Description	M9.00	M9.02
Flow	F3.00	Paddlewheel Flow sensor	■	■
	F3.20	High pressure Paddlewheel sensor	■	■
	F6.30	Paddlewheel Flow Transmitter		
	F3.10	Paddlewheel Mini Flow sensor	■	■
	F3.05	Paddlewheel Flow switch		
	F6.60	Magmeter Flow Sensor		■
	F6.61	Hot Tap Magmeter Flow Sensor		■
	F111	Hot Tap Paddlewheel and Turbine Flow sensor	■	■
	ULF	Ultra Low Flow sensor	■	■
F3.80	Oval Gear Flow sensor		■	
pH/ORP	pH/ORP 200	Epoxy body Bulb electrodes		
	pH/ORP 400	Glass body Bulb electrodes		
	pH/ORP 600	PVC-C Body Flat Surface electrodes		
	pH 800	Ryton Body Flat Surface electrodes		
Conductivity	C150-200	Graphite or Platinum Conductivity sensors		
	C100-300	Stainless steel Conductivity sensors		
	C6.30	Inductive Conductivity Transmitter		
Pressure/Level	HF6	Level and Pressure Transmitter		

* Traded

PVC-U	PVC-C	PP-H	PVDF	PE
PN 16 d 12÷500	PN 16 d 16÷200			
PN 16 d 16÷125	PN 16 d 16÷63			
PN 16 d 1/2"÷8"				
		PN 10 d 20÷110	PN 16 d 20÷110	
		PN 10 d 20÷63	PN 16 d 20÷110	
		up to PN 10 d 20÷400		up to PN16 d 16÷1000
		up to PN 10 d 20÷63		
up to PN 16 d 16÷315*	up to PN 16 d 16÷200	up to PN 10 d 20÷400	up to PN16 d 20÷110*	up to PN 16 d 16÷600*

M9.03	M9.20	M9.50	M9.05	M9.06	M9.07	M9.08	M9.10
■	■	■			■	■	■
■		■			■	■	■
Transmitter / PLC							
■		■			■	■	■
■		■			■	■	■
■	■	■			■	■	■
■	■	■			■	■	■
■		■			■	■	■
				■		■	
				■		■	
				■		■	
			■		■		
			■		■		
Transmitter / PLC							■
Transmitter / PLC							■

SURFACE TREATMENT TRANSPORTATION OF ACIDS



PROJECT

The client is a primary manufacturer of steel, selling primarily coils; such product is pickled before the coiling to remove organic deposits and rust that may impair the following treatments or impair the long term behaviour of the material.

To perform this task, the coils are treated with hydrochloric acid in a pickling process. The usual temperatures are about 60°; the concentration of the acid is about 30%, but metallic components are also dissolved in the solution. Temperature and time are to be controlled to avoid an insufficient pickling or overpickling.

The acids are also to be regenerated to remove the metallic components and to be reused in the process.



TECHNICAL SOLUTION

FIP supplied the whole set of plastic valves involved in the transportation of the pickling acid. The choice material for the piping was polypropylene, while the choice of the client for the valves was PVDF. The material was selected to prioritize the safety, reliability and operability of the system.

PVDF is the most suitable thermoplastic material for critical moving components like the valves due its superior chemical resistance, high temperature behaviour and strength.

The selected products were butterfly valves as well as flanged diaphragm and ball valves. The FK were supplied with a gearbox to ease the operability; both wafer and lug version valves were supplied.

The VKD PVDF valves allows a superior safety with its unique Dual Block feature since it avoids leakings caused by the piping vibration induced by the pumps.

A primary steel manufacturer in south east asia relies on fip products for the **transportation of the pickling acid** for surface treatment.

PRODUCTS SELECTION

Type	Model	Material	Actuation	Connection	Size	Gasket
Industrial ball valve	VKD	PVDF	Manual	Flanged	Up to DN50	FPM
Industrial butterfly valve	FK	PVDF	Manual gearbox	Lug flanged	Up to DN200	FPM
Diaphragm valve	VM	PVDF	Manual	Flanged	Up to DN100	FPM

PRODUCTION OF COPPER RUSSIA



FIP products installed in a copper production facility in Russia to optimize the conveyance of the leach solution for the electrowinning process.

PROJECT

Ural Mining and Metallurgical Company (UMMC) is among the world's biggest producers of copper, also producing other commodities including zinc, coal, gold and silver. UMMC operates 40 companies situated in Russia and other countries and has more than 80.000 employees. The copper, extracted from the mined ores through dissolution in a leach acid solution, has to be conveyed to the cells in the electro winning facility. The electrowinning process is the standard employed method for an efficient extraction of pure copper.

A mix of sulfuric acid and copper electrolytes composes the leaching solution; the temperatures can locally reach about 60°C. A magnetic field induced in the liquid solution forces the deposition of the dissolved copper ions on sheets. Such sheets, once a pure copper plating is produced, are removed from the cells for further mechanical treatments; the leaching solution is periodically replaced once the copper content has been collected.

TECHNICAL SOLUTION

FIP supplied the complete piping system for the transportation of the leach solution, composed by pipes, fittings and valves. The piping material selected by the end user was PVC-C due to its optimal mix of chemical stability and ease of installation. PP-H was used for the biggest dimensions. The diaphragm valves represent the largest part of the supply in terms of valves.

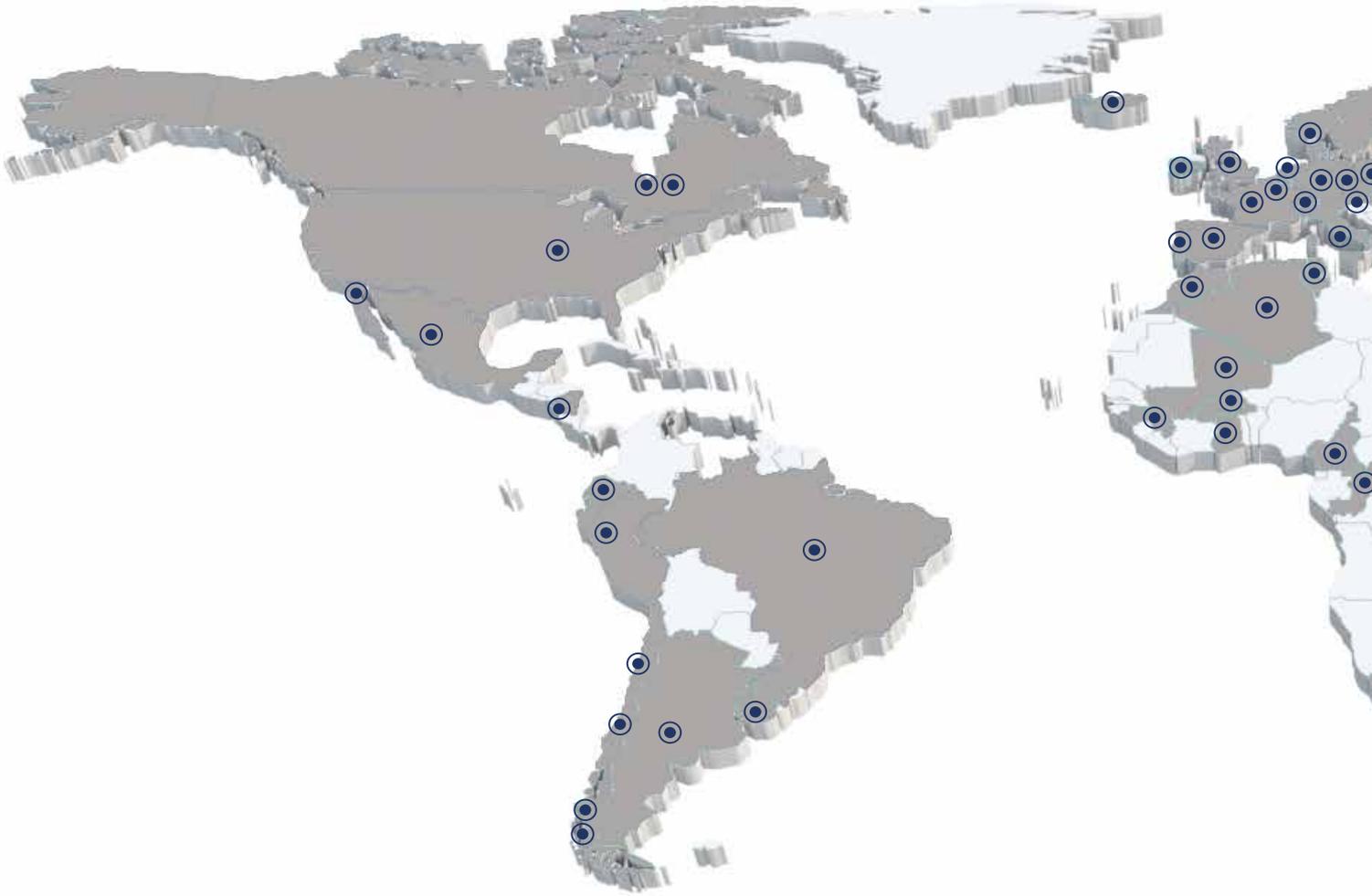
FIP supplied DK diaphragm valves in PP-H body with PVC-C end connectors for welding to the piping system, complying completely with the needs of the customer in terms of products and materials. FK butterfly valves were also supplied.

The about 1.600 diaphragm valves are the most suitable solution to transport the chemically aggressive fluid and play an important role in the whole production process. FIP DK valve had a winning edge over the main competitors with its high Kv and the possibility to regulate the flow rate, features obtained with the new optimized body design. Having low friction losses minimize the time to fill and empty the production cells, maximizing the plant efficiency. At the same time having the possibility to regulate the flow makes it easy for the operator to make fine regulation of the leach volume. The unionized version of the valve also allows for the fastest possible valve body replacement, again minimizing the production downtime.

PRODUCTS SELECTION

Type	Model	Material	Actuation	Connection	Size	Gasket
Pipes & fittings	-	PVC-C	-	Solvent welding	Up to d225	-
Pipes & fittings	-	PP-H	-	Solvent welding	Up to d400	-
Diaphragm valve	DK	PP-H with PVC-C end connectors	Manual	Union ends for solvent welding	Up to DN65	EPDM
Diaphragm valve	DK	PP-H	Manual	Flanged	Up to DN65	EPDM
Industrial butterfly valve	FK	PP-H	Manual	Flanged - wafer version	Up to DN315	EPDM
Check Valves	FR	PP-H	Self	Flanged	Up to DN250	EPDM

ALIAxis WORLDWIDE



THE ALIAxis GROUP

We are a global leader in the manufacturing and distribution of fluid handling solutions. Our extensive plastic pipes and fittings offering finds its way into buildings, infrastructure and industrial applications all over the world. With a global workforce of more than 16,000 employees, our flexibility means we provide both standard and tailored solutions that match the needs of our customers and end-users perfectly.

Our Group is active through more than 100 manufacturing and commercial companies, operating in over 45 countries. Aliaxis is privately owned, and our global headquarters is in Brussels, Belgium.

CUSTOMER-FOCUSED INNOVATION

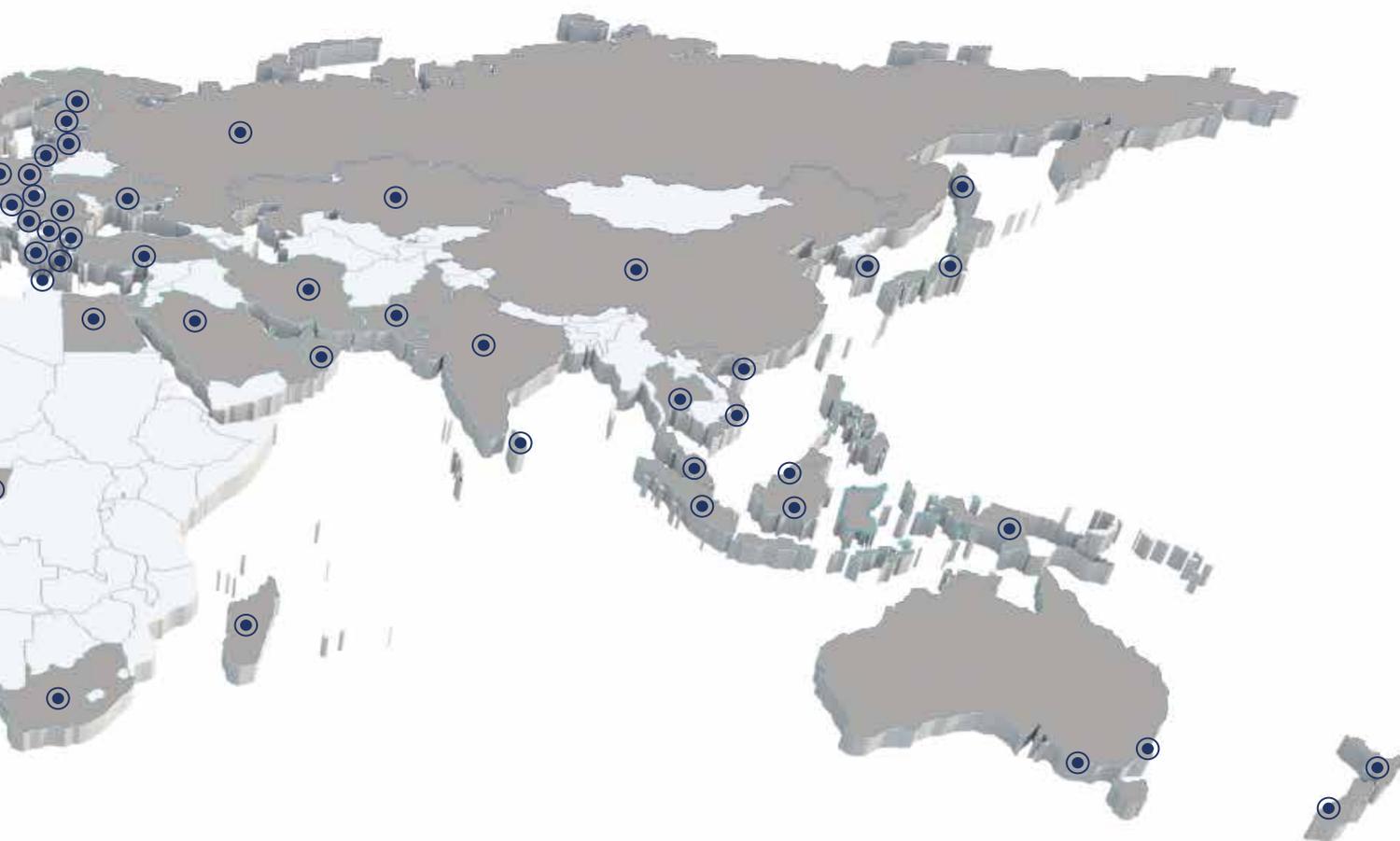
Innovation is key for Aliaxis. In our highly competitive sector, innovation is one of the most powerful differentiators. We invest in market-leading R&D and dedicate people to develop what our customers need - products and solutions to get projects up and running, quickly, easily, reliably and more profitably. And by sharing practices and learning from colleagues and customers around the world, we innovate at speed.

HEALTH AND SAFETY ABOVE ALL

The health, safety and well being of our employees are our top priority. We aim to raise our overall safety performance, with a goal of zero accidents worldwide. Our global safety community, consisting of HSE managers from our different divisions, is dedicated to streamlining the structural exchange and the transfer of best practices.

COMMITTED TO THE ENVIRONMENT

Lifecycle analyses have shown that plastic pipe systems are not only more environmentally-friendly but also healthier alternatives to pipes made from other materials. But we don't rest on our laurels. Environmental protection is taken into account for each of our business processes. Our environmental programme defines specific KPIs for monitoring CO₂ emissions, non-recycled waste and water consumption. It also includes initiatives aimed at sharing best practices and training, as well as raising environmental awareness among our employees.



THE ALIAXIS DISTRIBUTION NETWORK

- **AKATHERM** - Netherlands
- **DURAPIPE** - United Kingdom
- **AKATHERM-FIP** - Germany
- **ALIAxis UI** - France
- **ALIAxis UI** - Spain
- **NICOLL** - Greece
- **ALIAxis UI** - Russia
- **ALIAxis UI** - Poland
- **ALIAxis UI** - Hungary & CEE
- **ALIAxis UI** - Bulgaria
- **ALIAxis UI** - Serbia
- **ALIAxis UI** - Romania
- **GLYNWED UAB** - Baltics
- **ALIAxis** - Singapore & SEA
- **ALIAxis Fluid Systems** - China
- **VINIDEX** - Australia
- **RX PLASTICS** - New Zealand
- **IPEX** - Canada
- **IPEX** - USA
- **HARRINGTON INDUSTRIAL PLASTICS** - USA
- **HARRINGTON INDUSTRIAL PLASTICS** - Mexico
- **DURMAN** - Mexico
- **NICOLL** - Peru
- **NICOLL** - Brazil
- **VINILIT** - Chile
- **DURMAN** - Colombia
- **DURMAN** - Costa Rica
- **NICOLL** - Uruguay
- **MARLEY** - South Africa

Aliaxis

FIP Formatura Iniezione Polimeri

Loc. Pian di Parata, 16015 Casella Genova Italy

Tel. +39 010 9621.1

Fax +39 010 9621.209

info.fip@aliaxis.com

www.fipnet.com

