

# INDUSTRY & APPLICATIONS



Comprehensive pipe solutions

**PAM**  
SAINT-GOBAIN



# INDUSTRY & APPLICATIONS

## PAM within the Saint-Gobain group

### Saint-Gobain, a unique world brand

Saint-Gobain PAM, with a unique world brand, is part of the Construction Products Division of Saint-Gobain, one of the world's leading industrial groups, specialised in the production, conversion and distribution of materials for industry and construction.

Saint-Gobain's skills are organised around four areas of activity: Building Distribution, Construction Products, Packing and Innovative Materials. In addition to glass, Saint-Gobain also excels with many other materials such as plastics, mortars, gypsum and cast iron.



### Innovation as driving force

Since 1665, Saint-Gobain has always been characterised by its ability to invent products which improve its contemporaries' quality of life.

The Group, which is one of the hundred largest industrial companies worldwide, continues to deploy its technological know-how, often in partnership with the most prestigious universities and laboratories.



Saint-Gobain is one of the 100 most innovative companies in the world



# PAM, the world leader in ductile iron pipeline systems

The PAM brand has become the global reference in the pipeline world thanks to innovations and the quality of technical solutions. Each year, the Research and Development Centre files more than 50 inventions with INPI, the French National Industrial Property Institute, for products and processes.

- PAM is the largest ductile iron manufacturer in the world (pipes, fittings and accessories).
- For over 150 years, its reputation in the pipe professions has been based on its skills, the reliability and performance of its products.
- With its widespread network, commercial and technical support is available anywhere in the world. PAM's relationship with its clients is based on a true partnership.
- Reputed for the quality of its products, PAM increases the value of its solutions by adding a range of services and undertaking to be responsive in its operations, whether developing projects, during delivery or maintenance.
- A complete range of solutions dedicated to potable water supply, sewerage and evacuation of waste water is available.
- You have the guarantee that European and international standards are respected (SMQ ISO 9001 and ISO 14001 certification and ISO 2531 product certification).

## PAM is an expert in equipment for hydraulic networks



30 % of the products sold by PAM did not exist 5 years ago

more than **150** years of experience present in more than **126** countries

Turnover of  
**€1.7 B**

**40 000**  
kilometres of pipeline  
delivered each year

**50 000**  
catalogue references



# Ductile iron, an innovative material

Ductile iron pipelines, with their linings and joints adapted and adaptable to the various ground configurations withstand all the challenges of transport, handling, installation and operation.

## Exceptional mechanical properties

Yield stress, Rp 0.2	300 MPa
Tensile strength Rm	420 MPa
Elongation at break, E	10 % for DN 60 to 1000 7 % for DN 1200 to 2000
Modulus of elasticity	170 000 MPa
Thermal coefficient of expansion	11x10 <sup>-3</sup> mm / m °C
Density	7.05g / cm <sup>3</sup>

These characteristics give the pipes the ability to withstand the most demanding mechanical conditions and environmental constraints.



*The junctions are made by inserting one pipe into the next. Watertightness is produced by compression of the elastomer joint gasket between two metal walls. The contact pressure on the elastomer joints increases as the internal pressure increases making the system highly reliable in operation.*



*The innovation of the Zinalium lining: life expectancy multiplied by 3 compared with a traditional lining.*



*Junctions allow an angular deflection permitting improved resistance to ground movements, more freedom during installation and fewer fittings.*

## High safety factors

- For a DN 800 pipe, allowable operating pressure (AOP\*) reaches 30 bar with a safety factor of 3 (the pipeline withstands up to 3 times this pressure)
- The maximum allowable operating pressure (MAOP \*\*) is 36 bar
- The safety factor is 1.5 for the pipelines (buried pressure pipes) subject to various stresses: earth loads, traffic loads, settlement or small ground movements, accidental overload, etc.

\*AOP: the maximum hydrostatic pressure which a component is able to withstand permanently in service.

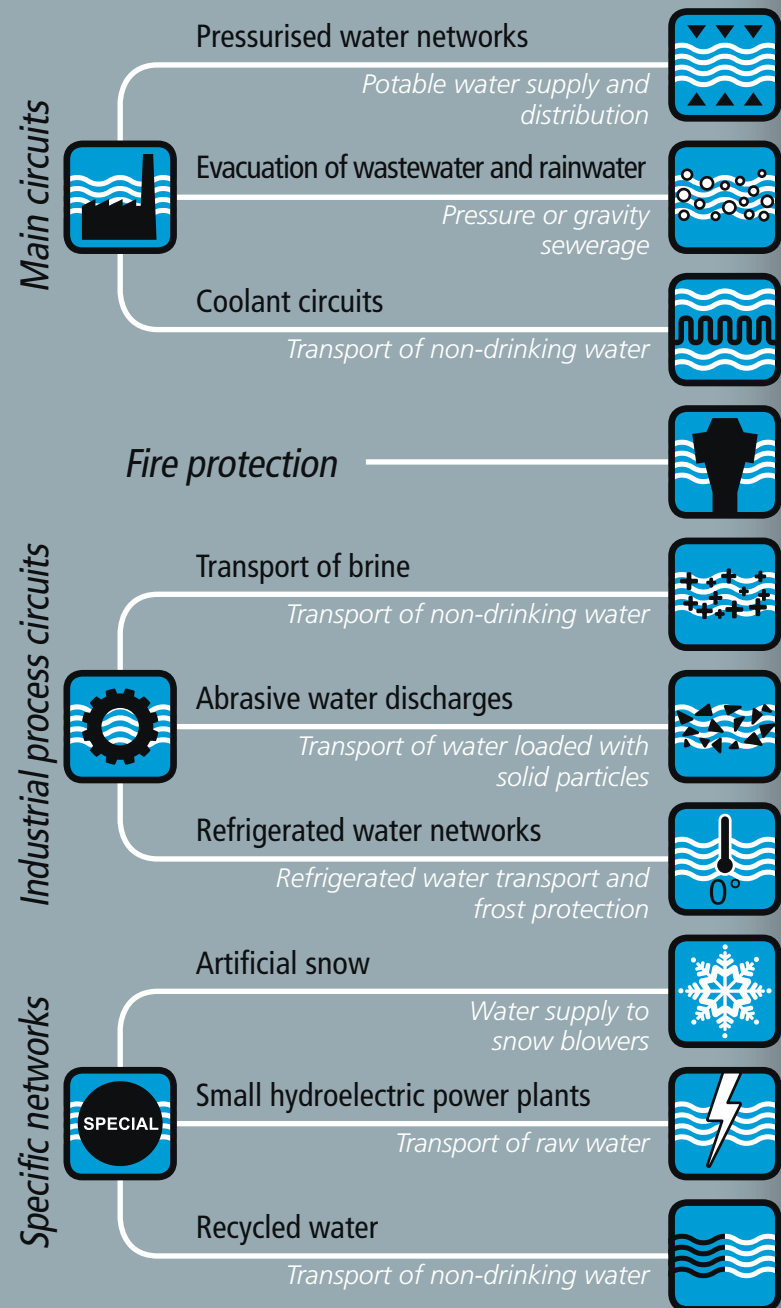
\*\*MAOP: the maximum pressure that a component is capable of withstanding when subjected intermittently to it in service, including water hammer
















# Ranges

## Applications



											
	<b>Flanged parts</b> Pipes, fittings, joints and accessories	<b>NATURAL</b> Pipes, fittings, valves, joints and accessories	<b>INTEGRAL</b> Pipes, fittings, valves and joints	<b>TAG</b> Pipes, fittings and joints	<b>CLASSIC</b> Pipes, fittings, valves, joints and accessories	<b>PLUVIAL</b> Pipes, fittings and joints	<b>FM</b> Pipes, fittings, gate valves, and accessories	<b>ISOPAM</b> Pipes, fittings, joints and accessories	<b>ALPINAL</b> Pipes, fittings, joints and accessories	<b>HYDROPAM</b> Pipes, fittings, valves and joints	<b>URBITAL</b> Pipes, fittings, joints and accessories
	DN 40 to 2000	DN 60 to 600			DN 700 to 2000						
	DN 40 to 2000		DN 80 to 2000	DN 150 to 300		DN 350 to 2000					
		DN 60 to 600			DN 700 to 2000						
		DN 60 to 600					DN 100 to 300				
			DN 80 to 2000								
			DN 80 to 2000			DN 350 to 2000					
					DN 700 to 2000			DN 100 to 600			
									DN 80 to 500		
										DN 60 to 2000	
											DN 100 to 1000
Flanged joint	Standard joint Express joint Universal joint	Standard joint Express joint Universal joint		IM joint	Standard joint Universal joint	Standard joint	Standard joint	Standard joint	Universal joint	Standard joint	Standard joint
-	Standard Vi joint Express Vi joint Universal Vi & Ve joint	ViLoK joint Standard Ve joint			Standard Ve joint Universal Ve joint Pamlock joint		Standard Vi joint	Universal Vi joint	Universal Vi & Ve joint	Universal Vi & Ve joint	Standard joint
metallic zinc (1) + bituminous paint	ZINALIUM (2) + blue epoxy	DN 80 to 600: ZINALIUM (2) DN 700 to 2000: metallic zinc (1) + brown/red epoxy	metallic zinc (1) + Aquacoat		metallic zinc (1) + bituminous paint	metallic zinc (3) + black epoxy paint	metallic zinc (3) + bituminous paint	Zinalium + poly-urethane foam	metallic zinc (1) + bituminous paint	metallic zinc (1) + bituminous paint	metallic zinc (1) + mauve epoxy
PUR or cement mortar	centrifuged cement mortar	centrifuged high alumina cement mortar	epoxy resin		centrifuged cement mortar	centrifuged high alumina cement mortar	centrifuged cement mortar	centrifuged cement mortar	centrifuged cement mortar	centrifuged cement mortar	centrifuged cement mortar
Standards EN 545, ISO 2531 and EN 598	Standards EN 545 and ISO 2531	Standards EN 598 and ISO 7186	Standards EN 598 and ISO 7186		Standards EN 545 and ISO 2531	Standards EN 598 and ISO 7186	Standards EN 545 and ISO 2531	Standards EN 545, ISO 9349 and ISO 2531	Standards EN 545 and ISO 2531	Standard EN 545	Standard EN 545
EN 545: ductile cast iron pipes, fittings and accessories and their assemblies for water pipelines. Requirements and test methods											
EN 598: ductile cast iron pipes, fittings and accessories and their assemblies for sewerage. Requirements and test methods											
ISO 2531: ductile iron pipes, fittings, accessories and their joints for the construction of pipelines.											
ISO7186: Ductile iron products for sewerage applications.											
ISO 9349: Preinsulated ductile iron pipes, fittings, accessories and their joints for the construction of pipelines.											

(1) 200 g/m<sup>2</sup>  
(2) 400 g/m<sup>2</sup> ZnAl  
(3) 130 g/m<sup>2</sup>

# Customer benefits



## No maintenance

### Zero maintenance (watertight)

The average leakage rate from existing European networks is more than 20 %. After installation, years of experience have shown a very low need for maintenance throughout the life cycle of PAM ductile iron pipelines.



## Ease and speed of installation

**Speed:** construction sites, even with large diameter pipes, proceed more quickly with the automatic joint.

**Ease:** no welding or cathodic protection

**Adaptable to all types of environment:** installation on a slope, across a river, over a bridge, above ground (pipe rack), buried installation and on piles.

### Trenchless pipe laying:

With for example, the installation of a PAM DIREXIONAL pipeline using horizontal directional drilling over a distance of more than 1500 m in Germany.



## Reliability

**High mechanical strength:** sustainable solutions, strengthened by our new linings. PAM ductile iron pipes have a life expectancy greater than 100 years with no changes to the mechanical characteristics.



## Energy and operating cost savings

### Reduced pumping energy:

by reducing head loss, the high hydraulic section of PAM pipelines contributes to lower pumping costs.



## PAM services

### Technical support on site. Upstream technical expertise:

a team of engineers and technicians provides technical support during design (hydraulic calculations, mechanical calculations, water analyses, soil surveys)

**Responsiveness:** hundreds of employees offer a personalised service to design offices, private operators, pipelaying companies and traders.

**Logistical support:** transport and logistics service to the site

**Proximity:** logistics platforms close to you and our sales and technical network located in 16 European countries and represented throughout the European Union.



## Complete systems

Not only pipes, but a complete range of connections, valves, municipal castings and accessories.



## Sustainable development

**Responsible production:** all plants are certified ISO 14001.

### Simplified pipelaying with PAM ECOPOSE:

54 % less material required on a wastewater discharge building site.

**Eco-design:** energy requirements reduced by 30 % over 15 years.

**Recycling:** ductile iron is 100 % and infinitely recyclable.



## Pages

## Industries

## Applications

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Mines



Pressurised water networks  
Abrasive water discharges

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Petrochemical & chemical industry



Pressurised water networks  
Fire protection  
Abrasive water discharges  
Municipal castings

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Iron and steel industry



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Recycled water  
Abrasive water discharges  
Municipal castings

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Automotive industry



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Municipal castings

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Power plants



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Recycled water  
Coolant circuits  
Municipal castings

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Small hydroelectric power plants



Pressurised water or penstock pipes  
Municipal castings

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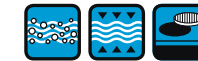
Paper mill & cellulose



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Municipal castings

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Water treatment plants  
*Sewage treatment plants*  
*Pumping stations*



Evacuation of wastewater  
Pressurised water networks  
Municipal castings

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Beverage manufacturing  
*Distillation*  
*alcoholic beverages*  
*soft drinks*



Fire protection  
Municipal castings

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Sugar refineries & ethanol production



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Municipal castings

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Winter sports resorts



Artificial snow

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Desalination plants & brine production



Brine transport  
Fire protection

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Aerodromes & airports



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Refrigerated water networks  
Municipal castings

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Logistics platforms & port areas



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Municipal castings

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Leisure zones  
*Amusement parks*  
*Leisure parks*  
*Golf courses*  
*Sports centres*



Pressurised water networks  
Fire protection  
Evacuation of wastewater and rainwater  
Recycled water  
Municipal castings

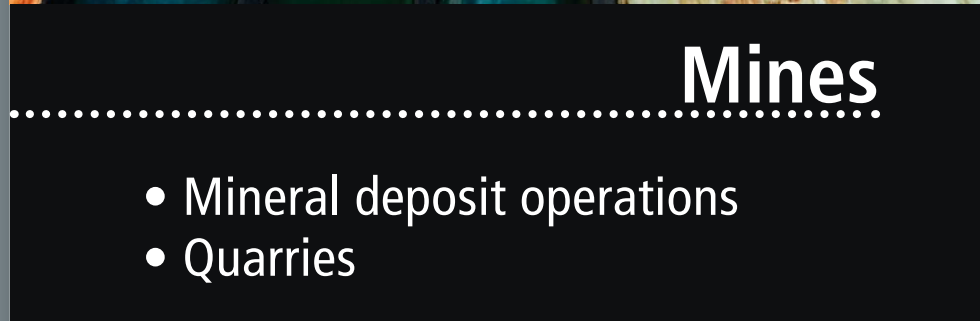
25

Activity centres:  
*hospitals*  
*university campuses*  
*cultural centres*  
*science parks*  
*shopping centres*



Fire protection  
Refrigerated water networks  
Evacuation of wastewater and rainwater  
Pressurised water networks  
Municipal castings





## We work with

-  **RIO TINTO, iron mine**  
Australia  
Potable water supply network
-  **VALE, iron and potash mine**  
Brazil  
Water supply network
-  **ANGLO AMERICAN, nickel mine**  
Brazil  
Water supply network
-  **BHP Billington, copper mine**  
Chile  
Water supply network
-  **URAMIN AREVA, uranium mine**  
Namibia  
Raw water supply network
-  **RAG, coal and hard coal mine**  
Herne, Germany  
Evacuation of minewater
-  **SNIM, iron mine**  
Mauritania  
Raw water supply network
-  **SICHUAN MINE, coal mine**  
China  
Raw water supply network
-  **OCP, phosphate mine**  
Morocco  
Reinforced air valves
-  **VALEINCO (ERAMET), nickel mine**  
New Caledonia
-  **LULEÅ, iron mine**  
Sweden

More than **4500** km of ductile iron pipelines installed worldwide

## Mines

- Mineral deposit operations
- Quarries

### Applications



**Pressurised water networks**  
*Potable and raw water supply and distribution*

### Ranges

**NATURAL CLASSIC**



**Abrasive and mine water discharges**  
*Transport of water loaded with solid particles*

**INTEGRAL**

## Petrochemical & chemical industry



### Applications



**Pressurised water networks**  
*Potable water supply and distribution*

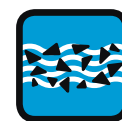
### Ranges

**NATURAL CLASSIC**



**Fire protection**

**FM**



**Abrasive water discharges**  
*Transport of water loaded with solid particles*

**INTEGRAL**



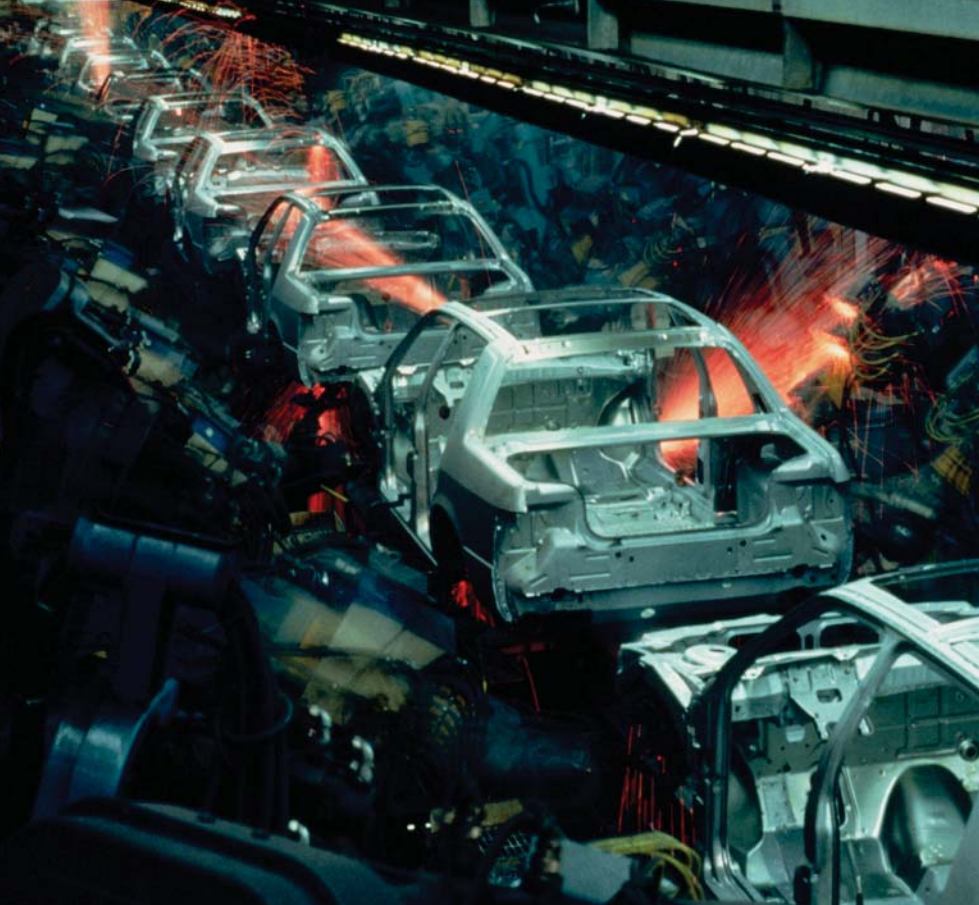
**Municipal castings**

PAMETIC duct covers  
PAMETANCHE manhole cover  
PAMREX manhole cover  
TRANSLINEA gratings

## We work with

-  **ELF**  
Donges, Loire-Atlantique, France  
Industrial sewerage and water supply network
-  **TOTAL**  
Gonfreville (76) and Grandpuits (77), France  
Fire network
-  **DUPONT DE NEMOURS**  
Haut-Rhin, France  
Water supply network
-  **ATOCHM**  
Carling, Moselle, France  
Fire network
-  **SHELL**  
Petit-Couronne, Seine-Maritime, France
-  **EXXON CHEMICAL**  
France
-  **SOLVAY**  
Bernburg, Germany  
Alkaline water network
-  **AKZO / HENGLO**  
Netherlands  
Fire network and salt water pumping network
-  **STATOIL**  
Denmark  
Fire network and wastewater network
-  **BRASKEM**  
Camaçari, Brazil  
Industrial process water evacuation
-  **PETROBRAS refineries**  
Brazil
-  **POINTE NOIRE refinery**  
Congo  
Fire network
-  **BAYER Chemical**  
Shanghai, China  
Raw and fire water supply network
-  **China Shenhua Coal to Liquid and Chemical Co**  
Yulin, China  
Evacuation of wastewater












## Iron and steel industry








### We work with

-  **VALLOUREC & SUMITOMO**  
Brazil  
Water supply network
-  **COSIGUA**  
Brazil  
Water supply network
-  **GERDAU**  
Brazil  
Water supply network
-  **HERCESA**  
Polígono Industrial, S.I.-20, Spain  
Water supply network

Applications	Ranges
 Pressurised water networks <i>Potable water supply and distribution</i>	<b>CLASSIC</b>
 Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> <b>PLUVIAL</b>
 Coolant circuits <i>Transport of non-drinking water</i>	<b>NATURAL CLASSIC</b>
 Fire protection	<b>FM</b>
 Abrasive water discharges <i>Transport of water loaded with solid particles</i>	<b>INTEGRAL</b>
 Recycled water <i>Transport of non-drinking water</i>	<b>URBITAL</b>
 Municipal castings	PAMREX manhole cover PARXESS manhole cover SQUADRA PMR grating

## Automotive industry

- Manufacturers
- Equipment manufacturers

Applications	Ranges
 Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL</b>
 Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> <b>PLUVIAL</b>
 Coolant circuits <i>Transport of non-drinking water</i>	<b>NATURAL CLASSIC</b>
 Fire protection	<b>FM</b>
 Municipal castings	PAMREX manhole cover PARXESS manhole cover TRANSLINEA gratings PAMETIC duct covers

### We work with

-  **SMART**  
Hambach, France
-  **RENAULT**  
Flins / Lardy Test Centre/  
Guyancourt Technocentre, France
-  **PEUGEOT**  
Poissy / Aulnay, France
-  **TOYOTA**  
Valenciennes, France
-  **CITROEN**  
Valenciennes, France  
Fire network
-  **FORD**  
Cologne, Germany  
Fire network
-  **BMW**  
Dingolfing / Regensburg / Munich, Germany  
Fire networks, potable water supply network,  
rainwater evacuation
-  **VOLKSWAGEN**  
Wolfsburg, Germany  
Potable and fire water supply network
-  **DAIMLER BENZ**  
Sindelfingen / Rastatt, Germany  
Industrial process water network,  
coolant circuits, fire network and potable water network
-  **PORSCHE**  
Leipzig, Germany  
Fire network
-  **AUDI**  
Ingolstadt, Germany  
Industrial process water network  
fire network
-  **JOHN DEERE**  
Madrid, Spain  
Fire network
-  **HYUNDAI**  
Brazil  
Fire network
-  **RENAULT**  
São José dos Pinhais, Brazil
-  **PEUGEOT**  
Porto Real, Brazil
-  **VOLKSWAGEN**  
São Bernardo do Campo, Brazil  
Fire network
-  **DONGFENG MOTOR CORPORATION**  
Shiyan, China  
Water supply network
-  **MICHELIN**  
Clermont-Ferrand, France  
Fire networks
-  **VALEO**  
France
-  **GOODYEAR**  
Germany  
Water supply network
-  **ZF SACHS**  
Schweinfurt, Germany  
Coolant circuit
-  **MICHELIN**  
Itatiaia and Resende, Brazil  
Fire networks







## Hydroelectric power stations and small power stations

### We work with

-  **EDF - La BATHIE SALLESTET** hydroelectric power station  
Isère, France
-  **LAPPVIK** micro power station  
Norway
-  **URKE KRAFTVERK** and **DITTIELVA KRAFTVERK** micro power station  
Norway
-  **MARQUARTSTEIN** hydroelectric power station  
Germany  
Pressure pipe
-  **EGO Elektrizitätsgenossen-schaft**  
Ohlstadt, Germany  
Pressure pipe
-  **RIBEIRA DA PRAIA** hydroelectric power station  
Portugal
-  **THISSAVROS** hydroelectric power station  
Greece
-  **Bocaina** micro power station  
Brazil







More than **100** projects are designed by Saint-Gobain PAM for hydroelectric power stations each year and delivered worldwide.



Applications	Ranges
 Small hydroelectric power plants <i>Transport of raw water</i>	<b>HYDROPAM</b>
 Municipal castings	PAMETIC duct covers PAMETANCHE manhole cover PAMREX manhole cover



## Solar and traditional power plants

Applications	Ranges
 Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL CLASSIC</b>
 Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL PLUVIAL</b>
 Coolant circuits <i>Transport of non-drinking water</i>	<b>NATURAL CLASSIC</b>
 Fire protection	<b>FM</b>
 Recycled water <i>Transport of non-drinking water</i>	<b>URBITAL</b>
 Municipal castings	PAMETIC duct covers PAMREX manhole cover PARXESS manhole cover TRANSLINEA gratings

### We work with

-  **CHINON** nuclear power station  
Indre-et-Loire, France  
Fire network
-  **BUGET** nuclear power station  
Ain, France  
Fire network
-  **CATTENOM** nuclear power station  
Moselle, France  
Coolant circuits
-  **SAINT-LAURENT-DES-EAUX** nuclear power station  
Loir-et-Cher, France  
Fire network
-  **TAJI Power Plant**  
Iraq  
Fire network
-  **TERMOSOLAR - EXTRESOL** solar power station  
Badajoz, Spain  
Water supply network
-  **SOLUCAR** solar power station  
Seville, Spain  
Water supply network
-  **UTE PARNAIBA II** thermal power station  
Geração, Brazil  
Water supply network





## Paper and cellulose industry

### We work with

**LA CELLULOSE DES ARDENNES**  
Belgium  
Fire network  
Raw and potable water supply network  
Industrial discharges





**KIMBERLY CLARK INDUSTRIES**  
Villey, Meurthe-et-Moselle, France  
Raw water network  
Industrial discharges  
Fire network

**NORSKE SKOG**  
Golbey, Vosges, France  
Fire network

**AUSSEDAT-REY paper mill**  
Saillat, Haute-Vienne, France  
Fire network and industrial network

**ELDORADO BRASIL**  
Três Lagoas, Brazil  
Fire network

**VOTORANTIM CELULOSE E PAPEL**  
Três Lagoas, Brazil  
Fire network




Applications	Ranges
 Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL CLASSIC</b> Flanged parts
 Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> <b>PLUVIAL</b>
 Fire protection	<b>FM</b>
 Municipal castings	PAMREX manhole cover PARXESS manhole cover TRANSLINEA gratings PAMETIC duct covers



## Water treatment

- Sewage treatment plants
- Pumping stations
- Slide valve chambers



Applications	Ranges
 Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL CLASSIC</b> Flanged parts
 Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> Flanged parts
 Municipal castings	PAMETIC duct covers PAMETANCHE manhole cover PAMREX manhole cover

### We work with

- STEP, Vesoul**  
France
- Greater Nancy drinking water production facility**  
Nancy, France
- Shuheiwat slide valve chambers**  
United Arab Emirates
- STEP, Oupeye**  
Liège, Belgium
- Warsaw pumping station**  
Poland
- North Doha STEP and slide valve chambers**  
Qatar







## Beverage manufacturing

- Distillation
- Alcoholic beverages
- Soft drinks



### We work with

- COCA-COLA**  
Paris region, France  
Fire network
- NESTLÉ**  
France  
Refrigerated water network
- COGNAC MARTEL distillery**  
Paris region, France  
Fire network
- NESTLÉ**  
Germany  
Mineral water transport
- Adelholzer Mineralbrunnen**  
Bad Adelholzen, Germany  
Mineral water transport
- WARSTEINER Brewery**  
Germany  
Water supply network
- STELLA ARTOIS Brewery**  
Belgium  
Fire reservoir
- AMBEV - Brahma brewery and Passo Fundo brewery**  
Brazil  
Water supply network

### Applications



Pressurised water networks  
*Potable water supply and distribution*



Evacuation of wastewater and rainwater  
*Pressure or gravity sewerage*



Refrigerated water networks  
*Refrigerated water transport and frost protection*



Fire protection



Municipal castings

### Ranges

**NATURAL**  
**CLASSIC**  
Flanged parts

**INTEGRAL**  
**TAG**  
**PLUVIAL**

**CLASSIC**  
**ISOPAM**

**FM**

PAMREX manhole cover  
PARXESS manhole cover  
TRANSLINEA gratings  
PAMETIC duct covers



## Ethanol & Sugar refineries



### Applications



Pressurised water networks  
*Potable water supply and distribution*



Evacuation of wastewater and rainwater  
*Pressure or gravity sewerage*



Fire protection



Municipal castings

### Ranges

**NATURAL**

**INTEGRAL**  
**PLUVIAL**

**FM**

PAMREX manhole cover  
PARXESS manhole cover  
TRANSLINEA gratings  
PAMETIC duct covers

### We work with

- CONNANTRE sugar refinery**  
Marne, France  
Beet washing water network
- BAZANCOURT sugar refinery**  
Marne, France  
Beet washing water network
- SILLERY sugar refinery**  
Marne, France  
Beet washing water network
- SAINTE-ÉMILIE sugar refinery**  
Somme, France
- A.V.E.B.E starch works**  
Haussimont, Marne, France
- SOUPPES-SUR-LOING sugar refinery**  
Seine-et-Marne, France
- ARCIS-SUR-AUBE sugar refinery**  
Aube, France  
Beet washing water network
- BRIE CHAMPAGNE ETHANOL**  
Nangis, Seine-et-Marne, France  
Beet washing water network
- COSAN**  
Brazil  
Water supply network
- USINA CONQUISTA DO PONTAL**  
Mirante do Paranapanema, Brazil  
Water supply network
- AGRO ENERGIA SANTA LUZIA**  
Nova Alvorada do Sul, Brazil  
Water supply network





## Winter sports resorts

### We work with

-  **COURCHEVEL**
-  **SERRE-CHEVALIER**
-  **MEGEVE**
-  **LES ROUSSES**
-  **TIGNES**
-  **LES ARCS**
-  **VAL D'ISÈRE**
-  **VAL THORENS**
-  **HOCHZILLERTAL**  
Austria
-  **BESCHN. GERLOS**  
Austria
-  **VSETIN**  
Czech Republic
-  **GSTAAD ROUGEMONT**  
Switzerland
-  **FORMIGAL**  
Spain



### Applications



**Artificial snow**  
Water supply to  
snow blowers

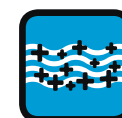
### Ranges

**ALPINAL**



## Desalination plants and brine production

### Applications



**Brine transport**  
*Transport of non-drinking water*



**Municipal castings**

### Ranges

**INTEGRAL**

PAMETIC duct covers  
PAMETANCHE manhole cover  
PAMREX manhole cover



### We work with

-  **RHONE POULENC**  
La Madeleine, Meurthe-et-Moselle, France  
Discharge of soda ash and brine transport
-  **SOLVAY**  
Dombasle, Meurthe-et-Moselle, France  
Brine transport
-  **SÜDSALZ**  
Berchtesgaden, Germany  
Salt water transport
-  **UMM AL NAR WEST**  
**desalination station**  
United Arab Emirates  
Sea water network
-  **NOUAKCHOTT**  
**desalination plant**  
Mauritania  
Sea water transport
-  **FUERTEVENTURA**  
**desalination plant**  
Canary Islands, Spain  
Sea water transport
-  **SOLVAY TORRELAVEGA**  
Spain  
Brine evacuation network





## Aerodromes & airports

## Logistics platforms

- Port areas
- Road platforms

### We work with

- AVON (Cosmetics)**  
Logistics platform, Brazil  
Fire network
- PECÉM - Harbour complex**  
Brazil
- GADIS - Logistics centre**  
Valladolid, Spain  
Water supply network
- ASTILLEROS**  
Shipyard, Spain  
Transport of crude oil and sea water
- BREST - Commercial port**  
Finistère, France
- Grand Port Maritime du Havre**  
Seine-Maritime, France  
Sewerage and rainwater network
- M.I.N., RUNGIS**  
Val-de-Marne, France  
Fire network
- HMNB**  
Portsmouth, United Kingdom  
PAMETIC duct covers
- CHANGI Naval Base**  
Singapore  
PAMETIC duct covers

### Applications

### Ranges



**Pressurised water networks**  
*Potable water supply and distribution*

**NATURAL**



**Evacuation of wastewater and rainwater**  
*Pressure or gravity sewerage*

**INTEGRAL  
TAG  
PLUVIAL**



**Fire protection**

**FM**



**Municipal castings**

PAMREX manhole cover  
URBAMAX manhole cover  
SQUADRA grating  
TRANSLINEA gratings  
PAMETIC duct covers

### Applications

### Ranges



**Pressurised water networks**  
*Potable water supply and distribution*

**NATURAL**



**Evacuation of wastewater and rainwater**  
*Pressure or gravity sewerage*

**INTEGRAL  
TAG  
PLUVIAL**



**Fire protection**

**FM**



**Refrigerated water networks**  
*Refrigerated water transport and frost protection*

**ISOPAM**



**Municipal castings**

PAMETIC duct covers  
TRANSLINEA gratings  
URBAMAX manhole cover

### We work with

- ADP (Aéroports de Paris)**  
Roissy / Orly, France  
Fire network, evacuation of wastewater
- AIRBUS (EADS group)**  
Blagnac, Haute-Garonne, France
- Service Spécial Bases Aériennes Ile-de-France (SSBAIF)**  
Paris, France
- CEPr (Propulsion test centre)**  
Saclay, Essonne, France
- Brétigny-sur-Orge air base**  
Essonne, France  
Water supply network, evacuation of wastewater
- LUXEMBOURG-FINDEL airport**  
Grand Duchy of Luxembourg  
Evacuation of wastewater and rainwater
- NATO airport**  
Ramstein, Germany  
Potable water network, evacuation of wastewater
- Hamburg airport**  
Germany  
PAMETIC duct covers
- LONDON Heathrow airport (T5)**  
United Kingdom  
PAMETIC duct covers
- CONGONHAS airport**  
São Paulo, Brazil
- BAIYUN airport**  
Guangzhou, China  
Fire network





## Leisure zones

- Golf courses
- Amusement parks
- Sports complexes
- Hippodromes



### We work with

- Disneyland Paris and Parc Walt Disney Studio**  
Marne-la-Vallée, Seine-et-Marne, France  
Fire network
- CENTER PARCS**  
Moselle, France  
Sewerage network
- INSEP**  
Institut National du Sport, de l'Expertise et de la Performance, Paris, France  
Fire network
- STADE DE FRANCE**  
Paris, France  
Water supply network
- UNIVERSAL STUDIOS**  
PortAventura, Spain  
Water supply network
- LA DEHESA, VILLANUEVA DE LA CAÑADA golf club**  
Madrid, Spain
- BENALMÁDENA golf club**  
Málaga, Spain

Applications	Ranges
Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL CLASSIC</b> Flanged parts
Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> <b>PLUVIAL</b>
Fire protection	<b>FM</b> Fire hydrants
Recycled water <i>Transport of non-drinking water</i>	<b>URBITAL</b>
Municipal castings	REXEL2 manhole cover T-MAX duct covers PARXESS manhole cover SQUADRA PMR grating Tree gratings



## Activity centres

- University campuses
- Shopping centres
- Cultural centres
- Science parks
- Hospitals

Applications	Ranges
Pressurised water networks <i>Potable water supply and distribution</i>	<b>NATURAL</b>
Evacuation of wastewater and rainwater <i>Pressure or gravity sewerage</i>	<b>INTEGRAL TAG</b> <b>PLUVIAL</b>
Coolant circuits <i>Transport of non-drinking water</i>	<b>NATURAL CLASSIC</b>
Fire protection	<b>FM</b>
Municipal castings	PAMETIC duct covers T-MAX duct covers PAMREX manhole cover PARXESS manhole cover SQUADRA PMR grating Tree gratings

### We work with

- The Max Planck Institute for Astrophysics**  
Garching, Germany  
Coolant circuit in a computing centre
- AMD (electronic components)**  
Dresden, Germany  
Industrial process water network
- HEC campus**  
Paris, France  
Sewerage network
- Polytechnique**  
Paris, France  
Water network
- ORSAY faculty**  
Paris, France  
Water network
- Villepinte exhibition site**  
Seine-Saint-Denis, France  
Municipal castings
- Aéroville shopping centre**  
Roissy, France  
Fire network
- Tung Chung Shopping Center**  
Hong Kong  
PAMETIC duct covers
- Banque de France**  
Paris, France  
Fire prevention
- NUEVO Hospital**  
Burgos, Spain  
Fire prevention
- BENITO MENI hospital**  
Valladolid, Spain
- TENON hospital**  
Paris, France  
Fire network
- SAINTE-ANNE hospital**  
Paris, France



# Applications

Main circuits

Pressurised water networks

Potable water supply and distribution

Evacuation of wastewater and rainwater

Pressure or gravity sewerage

Coolant circuits

Transport of non-drinking water

Fire protection

Industrial process circuits

Brine transport

Transport of non-drinking water

Abrasive water discharges

Transport of water loaded with solid particles

Refrigerated water networks

Refrigerated water transport and frost protection

Specific networks

Small hydroelectric power plants

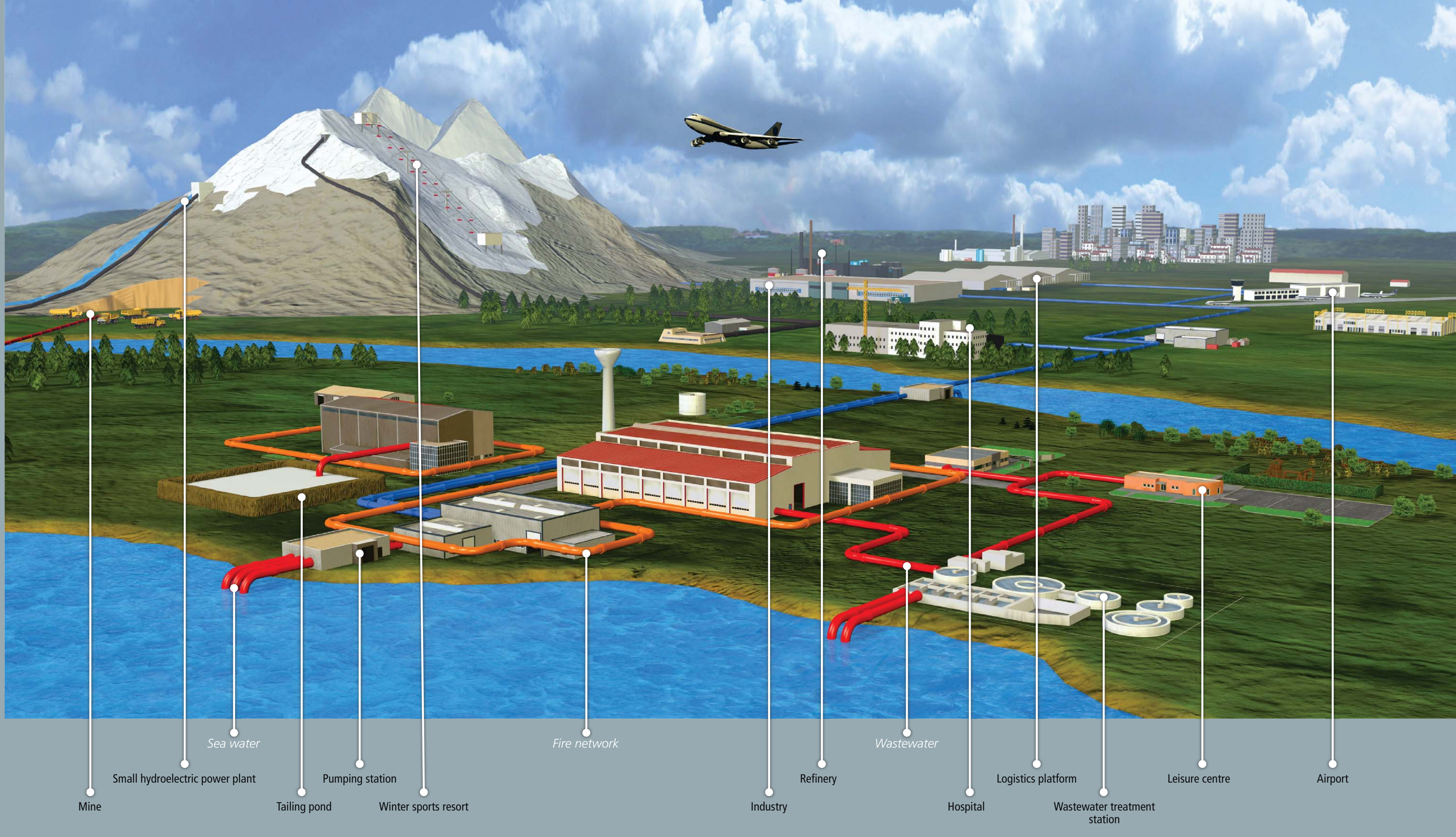
Transport of raw water

Artificial snow

Water supply to snow blowers

Recycled water




















Transport of non-drinking water





## Pipes and fittings ranges

DN








	<b>FLANGED PARTS</b> potable water and raw water fresh and mineral (PUR) water wastewater pH 1 to 12	40 to 2000	
	<b>NATURAL</b> potable water raw water soft and mineral water (PUR)	60 to 600	
	<b>INTEGRAL</b> wastewater sandy and abrasive effluents pH 1 to 12	80 to 2000	
	<b>TAG</b> wastewater pH 4 to 12	150 to 300	
	<b>CLASSIC</b> potable water raw water soft and mineral water (PUR)	700 to 2000	
	<b>PLUVIAL</b> sandy and abrasive effluents pH 4 to 12	350 to 2000	
	<b>FM</b> raw and potable water	100 to 300	
	<b>ISOPAM</b> raw and potable water wastewater pH 4 to 12	100 to 600	
	<b>ALPINAL</b> pipeline system for artificial snow	80 to 500	
	<b>HYDROPAM</b> raw water	60 to 2000	
	<b>URBITAL</b> recycled water	100 to 1000	

Note 1: For special soil types (marine, acidic, polluted, stray currents), PAM offers suitable protection systems

Note 2: For very soft or mineral water, PAM offers a specific range (PUR)

## Valve ranges

DN

<b>WAFER butterfly valve</b> PN10, 16 and 25 bar Manual and motorised	32 to 1200	
<b>LUG butterfly valve</b> PN10, 16 and 25 bar Manual and motorised	32 to 600	
<b>Penstock</b> Stainless steel 316-L Size: 150x2000 mm	150 to 2000	
<b>End valve</b> Stainless steel 304-L	80 to 2000	
<b>Euro 20</b> FM APPROVED	40 to 300	
<b>Eurostop isolation butterfly valve</b> AOP 10, 16 bar	150 to 2000	
<b>ATLAS fire hydrant</b> AOP 16 bar reversible and non reversible	100	

## Municipal castings range

Class

<b>Duct covers</b>  Watertight and modular duct covers with multiple covers	B 125 C 250 D 400 E 600 F 900	
<b>PAMREX</b> Heavy traffic, elastomer joint Hinged	D 400	
<b>URBAMAX</b> Heavy traffic elastomer joint	F 900 E 600	
<b>PAMETANCHE</b> High watertightness Locked with 6 bolts and clamps	D 400	
<b>TRANSLINEA</b> For transverse gutters Mechanical linking	E 600 D 400	
<b>PARXESS</b> For busy pavements Cover pressing and locking system	C 250	
<b>SQUADRA</b> Square frame Automatic locking	C 250	



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