

# IRRIGAL<sup>®</sup>

Ductile iron pipes system  
for irrigation



IRRIGATION WITH  
PEACE OF MIND

A SAFE PATH FOR WATER

**Adapting to climate change  
by investing in sustainable,  
cost-effective solutions**



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## SAINT-GOBAIN PAM CANALISATION, SERVING WATER SUSTAINABLY

As a designer and manufacturer of pipes systems, Saint-Gobain PAM Canalisation offers solutions that respect water resource and those who mobilize it. To guide its actions in the most responsible way possible, PAM draws on a number of tangible values and pursues concrete goals shared with the Saint-Gobain Group:



These goals reflect the United Nations' Sustainable Development Goals.

# IRRIGAL<sup>®</sup>

## THE SUSTAINABLE RESPONSE IN DUCTILE IRON TO THE NEW IRRIGATION CONTEXT



### DID YOU KNOW?

The legitimate place of ductile iron in irrigation was bolstered by the publication in 2022 of the international standard **ISO 23991 "Irrigation applications of ductile iron pipelines"**.



This standard specifies the design criteria, technical requirements, test methods, installation technologies and recommendations for use applicable to ductile iron pipes, fittings and accessories used in pressure pipeline irrigation systems.

In Europe, agriculture accounts for about 23.6% of total water withdrawals, rising to 80% or more in Mediterranean countries\*. This water is mainly used for irrigation.

### Climate change

As a consequence of climate change in Europe, drought is increasing the need for irrigation but also making the various users of this resource more frugal. Nevertheless, the performance of many irrigation systems is still insufficient: in the case of channels, for example, water is lost through evaporation and leaks caused by a lack of tightness.

More than ever, irrigation networks have to reliably transport a resource that has become precious. Saint-Gobain PAM Canalisation is responding to this challenge with IRRIGAL<sup>®</sup>: a range of cast iron pipes and accessories for irrigation.

### Sustainable development

In addition, **action plans** have been drawn up by various organisations to **boost resilience in the face of climate change**:

- The United Nations' **17 Sustainable Development Goals**, in particular Goal 13;
- The **European Commission's Green Deal**, aimed at achieving climate neutrality by 2050, one of the building blocks of which is the Circular Economy Action Plan (CEAP);

Saint-Gobain PAM Canalisation is committed to tackling these sustainable-development issues, which are taken into account throughout the life cycle of its products.

**IRRIGAL<sup>®</sup> pipes are watertight and durable, 100% recyclable and made from recycled material. They are made in accordance with processes designed to reduce the environmental footprint of production. The IRRIGAL<sup>®</sup> system strives to be virtuous throughout its life cycle.**

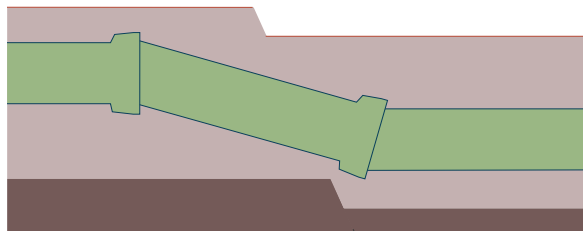
\* [https://climate-adapt.eea.europa.eu/fr/metadata/adaptation-options/improvement-of-irrigation-efficiency?set\\_language=fr](https://climate-adapt.eea.europa.eu/fr/metadata/adaptation-options/improvement-of-irrigation-efficiency?set_language=fr)

# THE BENEFITS OF IRRIGAL®

## A WATERTIGHT SYSTEM TO PRESERVE WATER RESOURCE

**Water is precious and expensive, so let's not waste a drop!**

IRRIGAL® pipes are connected by **elastomer joint gaskets**. Subject to stringent tests, the joint gaskets guarantee the system's tightness under high pressure. Thanks to these gaskets, the flexibility of IRRIGAL® pipelines enables the latter to withstand ground movements or environmental changes unaltered.



▲ System flexibility

◀ Push-in laying

IRRIGAL® **push-in** pipes, which are easy to lay while the trench is being excavated, do not require any tools or specialist personnel. The watertightness is automatic: the joint gasket is compressed when the spigot end of the pipe is inserted into the socket of the laid pipe.



### DID YOU KNOW?

In the agricultural sector, upgrading water conveyance infrastructure (e.g. closed pipes replacing open trenches) would allow a potential water saving of 10 to 25%\*.

\*In European Environment Agency report "Water resources across Europe - confronting water stress: an updated assessment"



## A VIRTUOUS SYSTEM TO PROTECT OUR RESOURCES

The European Union's Circular Economy Action Plan is taken into account throughout the life cycle of Saint-Gobain PAM Canalisation's products.

### DID YOU KNOW?

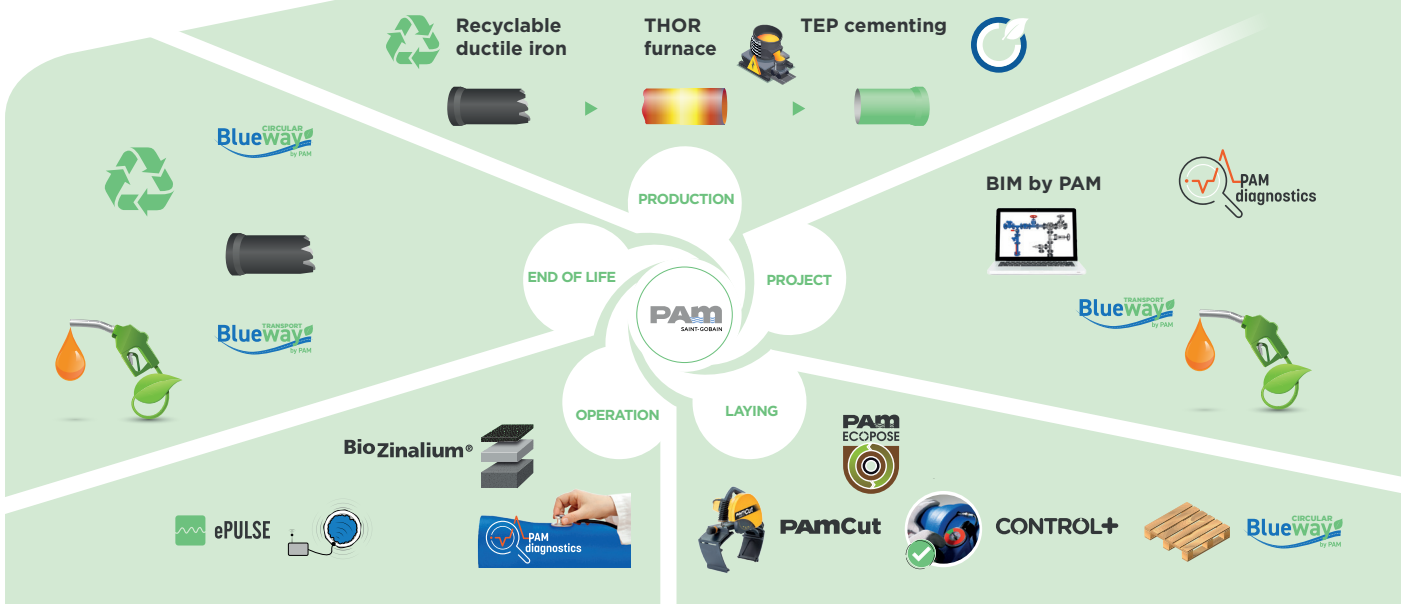
The European action plan for a circular economy is structured around a number of key areas, including product sustainability (design, sustainable production processes, etc.) and waste reduction. It also comprises measures to develop the creation of jobs and training in the circular economy\*.

\* <https://www.ecologie.gouv.fr/plan-daction-europeen-sur-leconomie-circulaire>



- **Eco-design;**
- **Designing of sustainable products;**
- **European manufacturing** that combines different processes to secure production and thereby guarantee the availability of products that provide access to water - an essential service;
- **Optimised transport solutions** to reduce CO<sub>2</sub> emissions: transport by train, ship or lorry powered by biofuels (Blueway Transport offer), etc.;
- **More environmentally-friendly installation of products:** "Ecopose" enables excavated soil to be reused to fill in the trench, thereby avoiding the use of new materials and lorries;
- **Virtuous management of packaging and cast iron offcuts / removed pipes** under the "Blueway Circular" offer: reuse, relocation, recycling, etc.;
- **Optimised network asset management** thanks to asset management tools (PAM Diagnostics, e-Pulse);
- **Product recycling:** Saint-Gobain PAM Canalisation plants are authorised to recycle ductile iron pipes and other ferrous materials.

### PAM: FOR YOU AND FOR THE CIRCULAR ECONOMY





## SUSTAINABLE PRODUCTION TO HELP COMBAT CLIMATE CHANGE

Saint-Gobain PAM Canalisation uses the best eco-friendly technologies available to make IRRIGAL®.

For example, the new "Thor" furnace at the Pont-à-Mousson plant is powered by electricity and smelts recycled cast iron. This furnace, combined with methods such as "scan pipe", which ensures that the thickness of the pipes is consistent to optimise the use of materials, is helping to reduce PAM's environmental footprint.



THOR furnace



Saint-Gobain PAM Canalisation's current technology and production in Europe make it possible to **reduce CO<sub>2</sub> emissions** to a third of the emissions attributable to other processes. In other words, the carbon footprint of **three PAM pipes is roughly equivalent to that of a single non-European pipe** produced with a technology other than the technologies recommended for environmental reasons.

### DID YOU KNOW?

**The European Green Deal** is a set of policy initiatives put forward by the European Commission with the overarching aim of making Europe climate neutral by 2050.



## **PAM LCA** SAINT-GOBAIN **A transparent ecological footprint** CALCULATOR

Saint-Gobain PAM Canalisation carries out **the full life cycle assessment** with the LCA PAM Calculator, a tool designed to assess the environmental footprint. It analyses the life cycle (LCA) from production, transport, laying, and operation to recycling.

Compliant with the EN 14044 standard, this software package is used to assess a project's:

- Greenhouse gas emissions;
- Fossil fuel consumption;
- The volume of water extracted from the environment.



## RELIABILITY TO IMPROVE THE RATE OF RETURN

### Choosing IRRIGAL® means investing to spend less!

With the IRRIGAL® system, there is no need to worry about any deterioration or even interruption of service. The pipes play their role perfectly and do so over time. Experience shows that ductile iron pipes can last well over 100 years.

- Cast iron is a robust material that withstands high operating pressure and external mechanical stress;
- Coatings provide long-term protection against corrosion and/or the abrasiveness of fluids;
- The joints adapt to overpressure and allow the system to withstand ground movements undamaged.



**PAM TCO**  
SAINT-GOBAIN  
**CALCULATOR**

**Invest to spend less**

The TCO PAM Calculator software package is designed **to assess the total cost of ownership**. It shows the investor's immediate costs and the operator's deferred costs.

The calculation method takes into account acquisition costs (pipes, laying, loans, etc.), operating costs and end-of-life costs (dismantling, recycling).

### DID YOU KNOW?

The eligibility criteria for the funding of water projects by various public authorities include a cost-benefit analysis.



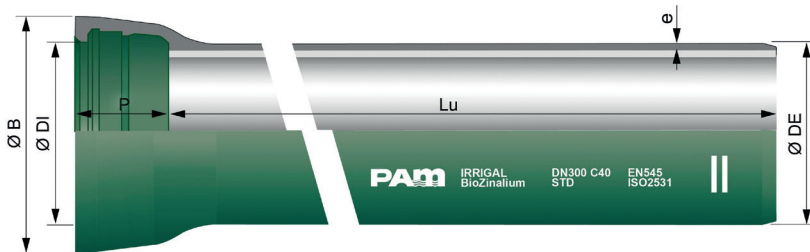
# RANGE OF IRRIGAL<sup>®</sup> PRODUCTS AND SERVICES



## A COMPLETE RANGE OF PRODUCTS

The IRRIGAL<sup>®</sup> range includes pipes and fittings from DN 150 to DN 1000, and isolating valves (gate valves).

### Main characteristics



DN mm	Lu (Unit length) m	Class	e mm	ø DE mm	ø DI mm	P mm	Ø B mm	Weight kg/m	Reference
150	6.000	C40	4.5	169.7	173.4	100.5	220.8	22.15	ISB15Q60AX
200	6.000	C40	4.7	221.6	225.2	106.5	275.1	30.200	ISB20Q60AX
250	6.000	C40	5.5	273.0	276.8	105.5	328.6	42.217	ISB25Q60AX
300	6.000	C40	6.2	324.9	328.8	107.5	385.3	55.550	ISB30F60AX
350	6.000	C30	6.4	376.8	380.9	110.5	444.5	68.833	ISB35G60AX
400	6.000	C30	6.5	427.7	431.9	112.5	494.6	79.400	ISB40G60AX
450	6.000	C30	6.9	478.6	483.0	115.5	546.5	93.800	ISB45G60AX
500	6.000	C30	7.5	530.5	535.0	117.5	600.9	111.150	ISB50G60AX
600	6.000	C30	8.7	633.3	638.1	132.5	712.0	150.560	ISB60G60AX
700	6.960	C25	8.8	738.0	741.7	192.0	821.9	186.200	Please contact us
800	6.950	C25	9.6	842.0	845.8	197.0	935.6	229.000	ISB80H70AQ
900	6.950	C25	10.6	842.0	948.9	200.0	1043.4	279.000	Please contact us
1000	6.960	C25	11.6	1048.0	1052.0	203.0	1152.4	334.000	Please contact us

### Pipe pressure performance

DN mm	PFA <sup>1</sup> bar	PMA <sup>2</sup> bar	PEA <sup>3</sup> bar	DN mm	PFA bar	PMA bar	PEA bar
150	62	74	79	500	28	33	38
200	50	60	65	600	26	31	36
250	43	51	56	700	29	35	40
300	38	46	51	800	28	33	38
350	33	39	44	900	27	32	37
400	30	36	41	1000	26	31	36
450	29	35	40				

(1) PFA - Internal pressure, excluding water hammer, that a component can safely withstand continuously under steady-state hydraulic conditions.

(2) PMA - Maximum internal pressure, including water hammer, that a component can safely withstand in service.

(3) PEA - Maximum hydrostatic pressure that can be applied on site to a component of a newly laid pipeline.

For higher PFAs, please contact us.

### External coating

BioZinalium<sup>®</sup>. It consists of a layer of 85-15 Zinc-Aluminium alloy enriched with copper, covered with a layer of AQUACOAT acrylic paint (sealer) with an average thickness of 80 microns; it is green in colour for DN up to 600 mm and blue above this value.

### Internal lining

blast-furnace cement mortar.



### DID YOU KNOW?

**UN Sustainable Development Goal 9.1** promotes the development of high-quality, reliable, sustainable and resilient infrastructure.

# RANGE OF IRRIGAL® PRODUCTS AND SERVICES



## SERVICES TO ENSURE THE SUCCESS OF YOUR PROJECTS

SAINT-GOBAIN PAM CANALISATION is committed to providing you with sustainable technical solutions and letting you benefit from constant innovation and the expertise of its specialists over the long term.

PAM is present at every stage of your project, including design, implementation, after-sales service and logistics:

- **Benchmark technical tools** to support decision-making: PAM provides you with powerful tools to help you make the best choices for your networks;
- **Assistance with your projects as from the design stage** through a team of specialists at your side;
- **Local sales teams** committed to ensuring the success of your projects: each order is monitored by a sales assistant who works alongside your sector manager. This team is your key partner for the success of your projects! ;
- **Local logistics** to respond to your emergencies.



### DID YOU KNOW?

Saint-Gobain PAM Canalisation's **Technocentre** - or research centre - has more than 100 employees. Its researchers (experts in metallurgy, materials, coatings and production processes) are working on future innovations.



# IRRIGAL® REFERENCES

For almost 20 years, Saint-Gobain PAM Canalisation has delivered major irrigation projects, demonstrating that its pipeline systems are the ideal solution to irrigation problems.

## A FEW EXAMPLES OF BODIES THAT HAVE PLACED THEIR TRUST IN US FOR THEIR IRRIGATION PROJECTS

- Irrigation Association of Ain (ASIA), France;
- BRL (Aqua Domitia programme of the Occitanie/Pyrénées-Méditerranée region), France;
- Irrigators community of Riegos de Levante, Alicante, Spain;
- Cordoba city council, Spain.



Credits: Nicolas Dohr, Patrick A. Martin, Shutterstock, Saint-Gobain PAM Canalisation

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