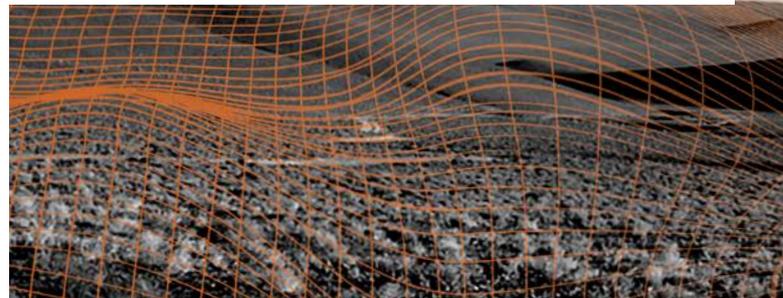
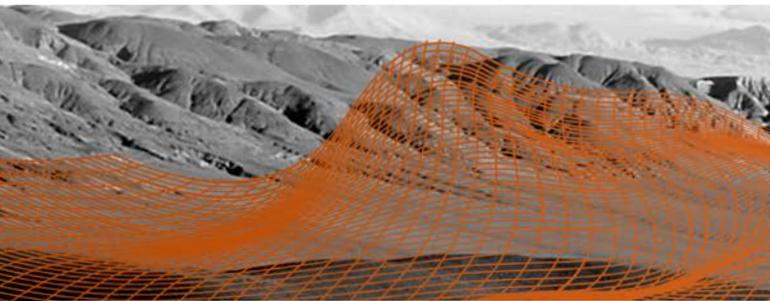


CONDUKMIN

**Sustainable, safe and cost-effective
solutions for the mining industry**



CONDUKMIN



“Reliability, safety and cost-effectiveness for the mining industry”

We develop a **complete range of pipe fittings and accessories** of outstanding durability **for abrasive and corrosive fluid transport**, compatible with any already existing system.



We design, supply and advise pipeline engineering solutions for mining: we are experts in fluid transport.



Our team of highly qualified offer their creative vision to face the challenges of a mining project.



We offer our complete portfolio of technical support services, both office based or on site.

We collaborate with the **best producers** to develop **specific solutions for the mining industry**.



We improve profitability through **long lasting and flexible solutions**, that lower operation costs and protect our environment: we add value.



We accompany you throughout the life cycle of the project. **From design to start-up**.



We are...



Sustainable

“Commitment that allows us to grow”

From design to start-up of our solutions, **we seek commitment to the environment.**

We fulfill, and push our partners and suppliers fulfill, with the **most demanding environmental and ecological standards.**

We work on a day to day basis on developing products and technologies with low environmental impact.

Because “sustainability” is the commitment that allows us to grow.



Innovative

“Pioneering solutions that deliver benefits”

R&D&I is the basis of our business. Our experienced and well qualified team combined with the high technological level that is employed in the design and feedback integrate to form a process of continuous improvement.

Constant evolution in the design and production processes, in the products and in their applications.

We always seek to be the first to offer innovative solutions that bring benefits to each of our customers’ projects, lowering operation costs and maximizing profitability.



Quality

“Today’s responsibility will determine tomorrow’s needs”

The quality of infrastructures, both hydraulic or otherwise, **will determine their durability and efficiency.**

At CONDUKMIN we offer **the best solutions in the market** both in terms

of the materials of our products and the services we provide.

All of our solutions are of internationally **approved quality and have the relevant certifications.**



Profitable

“Technology and quality as an investment for the future”

Our products undergo the **most demanding tests** to certify their strength and durability according to their uses.

We guarantee a long service life and minimal long-term maintenance costs.

Committing to CONDUKMIN is committing to technology and quality as **an investment for the future.**



Versatile

“We make complex problems viable”

Functional safety, cost effectiveness and the advantages of its application are the main criteria to be followed when selecting a CONDUKMIN range for a pipeline.

At CONDUKMIN **we offer the best solution** to satisfy the particular needs of your project.

Global Company



Steep Slopes



**Buoyancy
in Aggressive Waters**



**Bridge
Crossing**



Complex Laying



Directional Drilling



Complex Zones



Global Logistics



**No Concrete
Thrust Blocks**



Aggressive Soils



Slurry Transport

Engineering

In the office and on site, engineering is the axis on which all our activities rest. **More than 30 years' experience** developing all level of complexity projects for public institutions and private customers make us a solid choice.

CONDUKMIN Consulting

Our consulting service provides Know How in any project phase:

- Conceptual Engineering.
- Basic Engineering.
- Detailed Engineering.

Our application fields, for which we have dedicated personnel, software and first-class tools, are:

- **Hydraulic Engineering, pipeline and auxiliary structures.**
- **Topography and cartography.**
- **Geological and geotechnical studies.**
- **Hydrology and hydrogeology.**
- **Structural engineering.**
- **Budget and cost estimation.**



It is also possible to complement these services with the **construction project management service** that assures **convergence** between the design and the built project.

It is even possible to continue, in a **global project management context**, that allows an overall control of the project, oriented to performance and profitability.

Procurement

We supply **highest quality innovative products**. We team up with selected manufacturers and collaborate in improving industrial design and processes to provide solutions **to mining industry specific problems**.

Transport logistics

Our objective is to **improve the profitability of our customers' projects**. We supply CONDUKMIN range's products in the most efficient way, in the place and at the time requested.

Our own Logistics Department with more than three decades of experience managing international shipping, offers:

- Immediate quotes for supplying under CFR conditions (Incoterms 2010).
- Full traceability of the supply chain.
- Personalized communication.

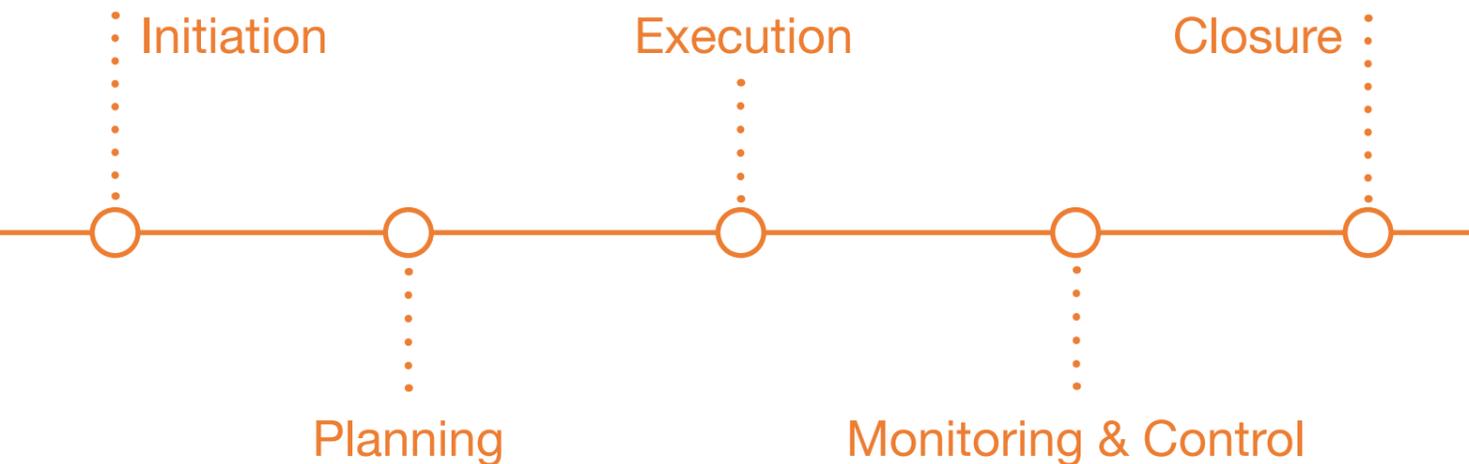


Three decades of experience managing international deliveries

Project management

We are **project management specialists in all its phases**, from planning to start-up.

Experience and reputed standards (PMBok, Prince2) are the key to risk's control and better project performance.



Good management keeps project under control

Integration Management • Scope Management • Time Management • Cost Management • Risk Management • Human Resources Management • Communications Management • Procurement Management • Stakeholders Management



Execution management

As one of the project management fields, Execution Management or Construction Management **focuses in achieving the convergence between the designed project and the built infrastructures.**

Thanks to a close project construction control, we do not only assure the achievement of the scope planned, but also **we can detect on time any eventual deviation from expected schedule or budget.**

Our **on site services** include:

- Training of the installing teams
- Performance optimization
- Inspection point program (PPI)
- Tests
- On site inspections and data adquisition
- 24/7 support
- Installation tests and start up

Our **technical desk work services** include:

- Recalculations
- Operation and maintenance manual drafting
- Quality and performance reports, and recommendations
- Technical compliance



CONDUKMIN range

MAIN ADVANTAGES

Strong material

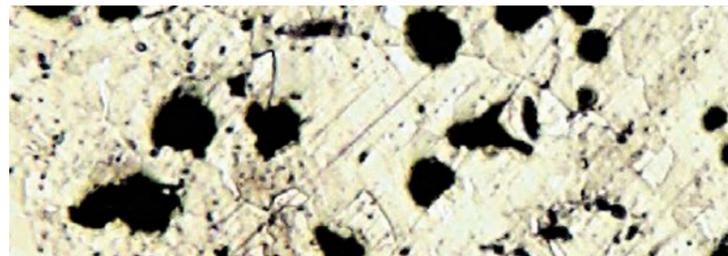
Our pipes are casted in **Ductile cast Iron (DI)**, iron, carbon and small amounts of magnesium alloy such that it precipitates spheroidal graphite. This gives the material a **much higher toughness and deformation capacity** before breakage than other castings and steels.

Ductile cast Iron (DI)

Ductile cast iron is **an innovative material**, which has characteristics that make it exceptional.

Ductile is equivalent to **moldable**: it can be bent thanks to its structural composition, which makes it a very strong material. Some of its physical properties include:

- Tensile strength: 75.000 psi (average)
- Minimum elongation before break > 10%
- Tensile yield: 49.000 psi (average)
- Charpy impact test 70°F: 9,3 (average)
- Charpy impact test -40°F: 5,8 (average)



Pipes are supplied in **18 feet nominal length** bars with all the necessary items for its assembly (gasket, grease, locking items). Bundles of pipes **ease on site handling**.

External and internal protection

Each pipe has factory applied internal and external protection layers that guarantee suitability to the ground it is laid in and the fluid transported.

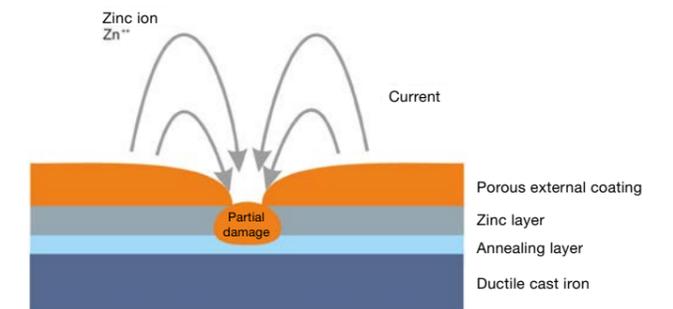
Maintenance free external protection

External coating **based in a zinc layer with a bitumen finishing coat in accordance with the ISO8179 standard allows safe installation** for most soil corrosion levels, buried or above ground. The zinc layer acts as passivation agent versus corrosive attack **with a self-healing effect that eliminates the need for external protection maintenance**.

For higher protection needs that require **extreme protection versus corrosion, abrasion or impact**, we have reinforced **ceramic epoxy (+R) external coatings available**.



Healing mechanism



Internal protection: a specific lining for each application needs

Raw water transport and fire protection. CML Range is lined with a cement mortar layer centrifugally applied, that assures outstanding compactness and durability. As an option, a Seal Coat finishing is available, that makes our pipe suitable for more aggressive water transport.

Acid water transport. EC Range incorporates the excellent chemical resistance of a novolac epoxy and slows bacterial growth, being also high abrasion resistant.

Slurry transport. ECW Range combines two different ceramic epoxy linings in different pipe sections, making up a product of outstanding abrasion resistance, focused on the bell and spigot end sections.



Lok&Play[®]: all road solution

Lok&Play[®] is a high traction resistant joint incorporated to ductile iron pipes. This makes it possible to face **any kind of installation** (rough terrain, high pressure, unstable soils, earthquake) **minimizing civil works**.

Flangeless locked joint

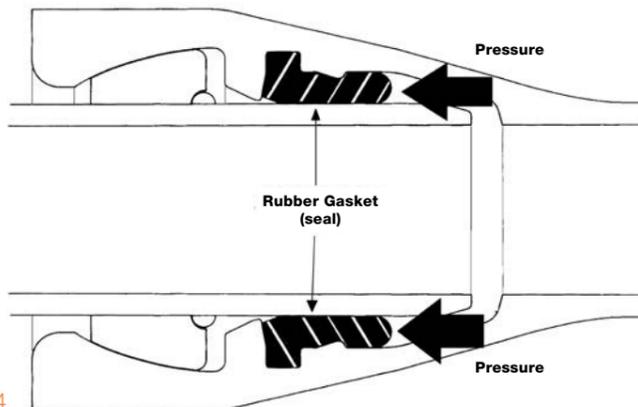
A spigot end and a bell end form each pipe. A rubber gasket and a set of locking segments are located inside the bell to prevent pipe disconnection. The system allows a **fast assembly** by just plugging and locking one pipe into the next one, **without the need for bolts or weldings**. Joint integrity and correct locking are easily verified.



Water tightness

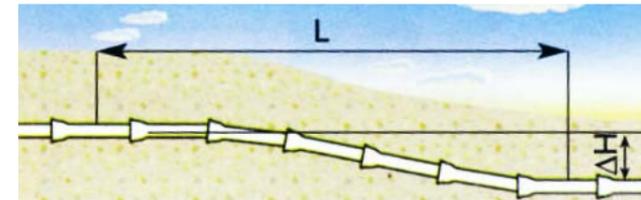
Water tightness is obtained thanks to a **Tyton[®] gasket** installed inside the bell. One side of the joint in contact with the fluid, and is deformed against the inside walls of the pipe bell due to growing fluid pressure, **achieving growing water tightness**.

*High corrosion and abrasion resistant Viton gaskets are available upon request.



Seismic Resistance

Each joint deflection capability, together with its expansion/contraction tolerance and its disconnection resistance make this product **earthquake resistant**.



Deflection, adaptability

The joint system allows deflection on each of the joints (every 18 feet). This makes adaptation to the **ground and in-trench or above ground installation feasible**, without the need for complex civil works.

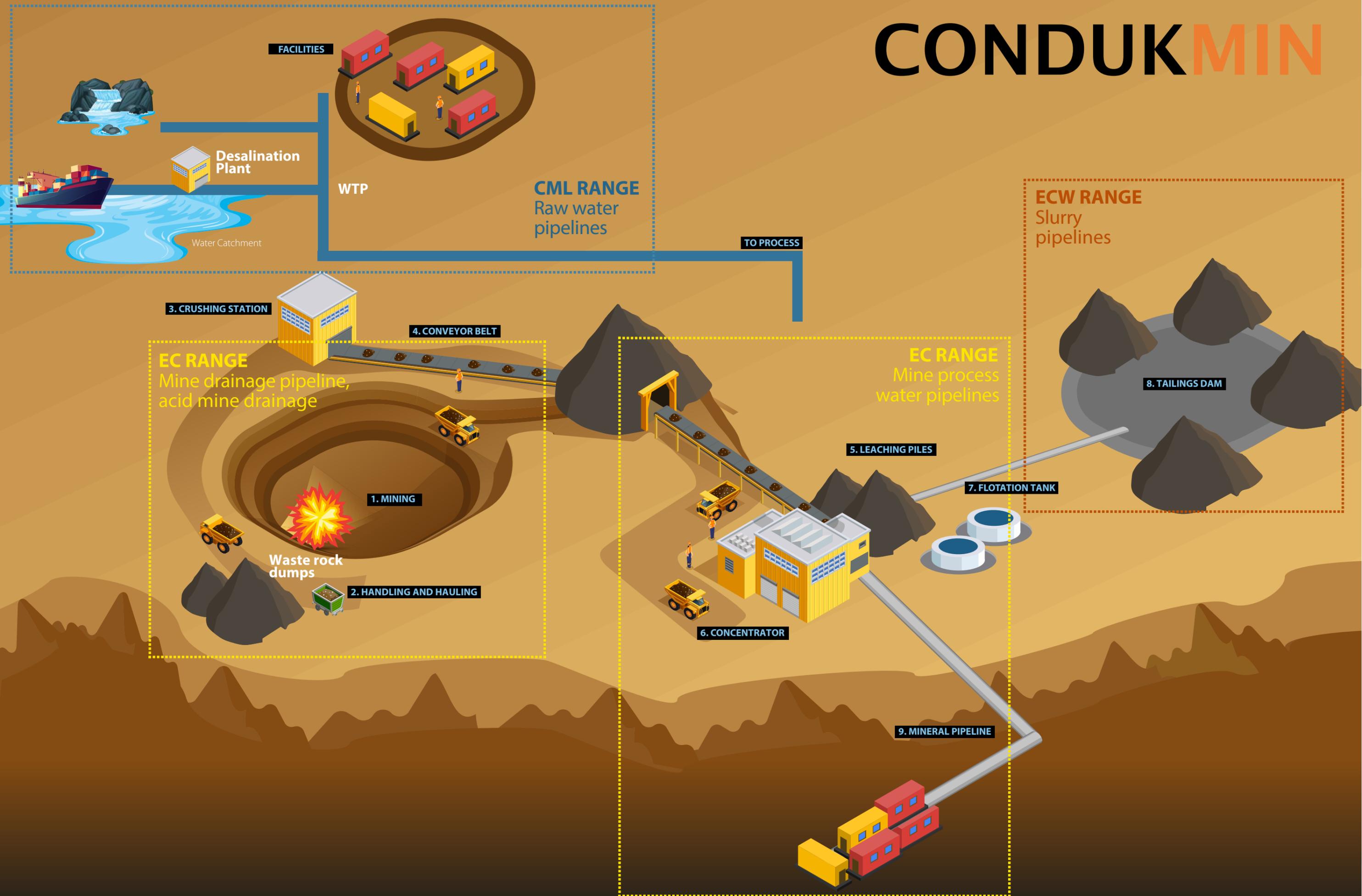


No concrete blocks

The **disconnection resistant design** of the joint **avoids installation of concrete thrust blocks** in the direction changes of the line. The complete line acts as a chain that transmits and dispels the hydraulic forces generated by friction against the surrounding soil.



CONDUKMIN



Slurry transport

Ductile iron pipes with locking joint and combined high resistance ceramic epoxy lining, **slurry transport abrasion resistant.**

ECW RANGE

Category
Ductile Iron Pipe

Application
Mining, Slurry transport

Acid water transport

Ductile Iron pipes with locking joint and ceramic epoxy lining **for acidic fluid transport.** Developed from the Novolac epoxy formula, for the specific protection of ductile iron in acid water lines, **offers chemical resistance from pH1.**

EC RANGE

Category
Ductile Iron Pipe

Application
Mining, process water transport

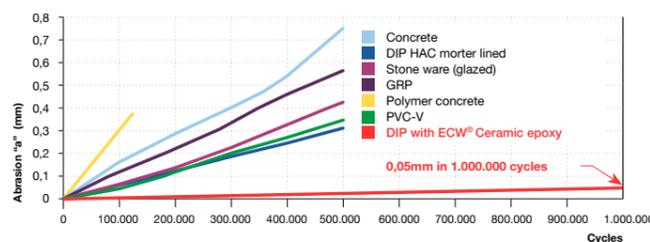
High Resistance against abrasion

In slurry transport, **internal lining should be able to withstand the abrasion generated by suspended particles.** Moreover, its roughness must be low to **offer little resistance to slurry flow**, minimizing head losses.

Advantages

- **Internal abrasion resistant:** outstanding durability.
- Outstanding chemical, electrochemical and biological **corrosion resistance.**
- **Outside coatings** suitable for all kinds of environments and installation requirements.
- Both buried or above ground **installation.**
- **No flanges, no bolts:** assembled in few minutes, easy dismantling.
- **No concrete thrust blocks and earthquake resistant.**

Darmstadt abrasion test. Material comparison.



*It measures the resistance to abrasion in pipes. The results show that the greatest resistance is given in Ductile Cast Iron pipes with Ceramic epoxy interior coating. After 1,000,000 cycles, the loss of coating thickness is negligible, while with other materials it is not possible to continue after 500,000 cycles.

Product technical data

Size ø Nominal diameter	4"-12" / 14"- 64"
Working pressure*	40Bar (600psi) / 25Bar (350psi)
Acidity resistance (pH)	1 to 13
Abrasion resistance	0,05 mm in 1.000.000 cycles
Absolute roughness (K abs)	0,0212 mm
Hazen Williams coefficient (c)	140
Internal lining	Ceramic Epoxy
External coating	Zinc Bitumen or Ceramic Epoxy+R

*Higher pressures on request



Tests

- ASTM G22** Resistance to growth of acidithiobacillus bacteria
- ASTM D1308** Effect of household chemicals on clear and pigmented finishes
- ASTM D714** Resistance to aggressive liquids
- ASTM B117** Salt spray testing
- ASTM G95** Resistance to cathodic disbondment
- ASTM E96** Permeance
- ASTM G14** Impact resistance for pipe line coating
- ASTM D1653** Permeability

Excellent Resistance to acidity: pH1 to pH13

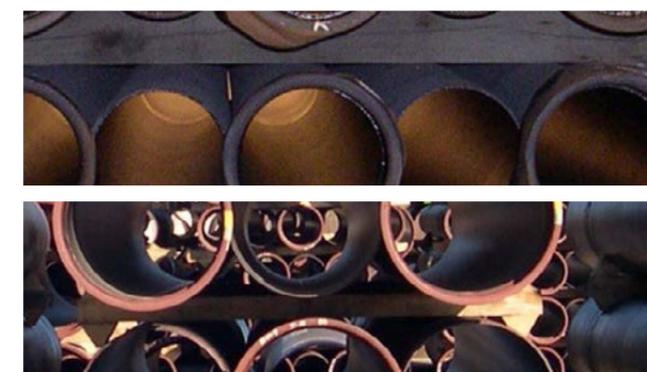
Tested to ASTM D714-87 by a 2 year immersion in 20% sulphuric acid without affection with no effect.

High Abrasion resistance: 0,05 mm thickness loss in 1.000.000 cycles (Darmstadt test)

Head losses

Low roughness factor is maintained over time, minimizing head losses. This together with its chemical and biological corrosion resistance, **keeps pipeline transport costs low.**

Corrosion protection guaranteed



Producto technical data

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Raw water transport

Ductile iron pipes with flangeless locking joint, internally lined with a compact and robust cement mortar layer to **ISO 4179**. Seal coat finishing layer available for its use with water above pH4.

CML RANGE

Category
Ductile
Iron Pipe

Application
Raw water
transport

Fire protection service

The right pipes and fittings to give water to critical facilities and workshops, feeding hydrants and connection points to conform a **high reliability system**, UL and FM approved.

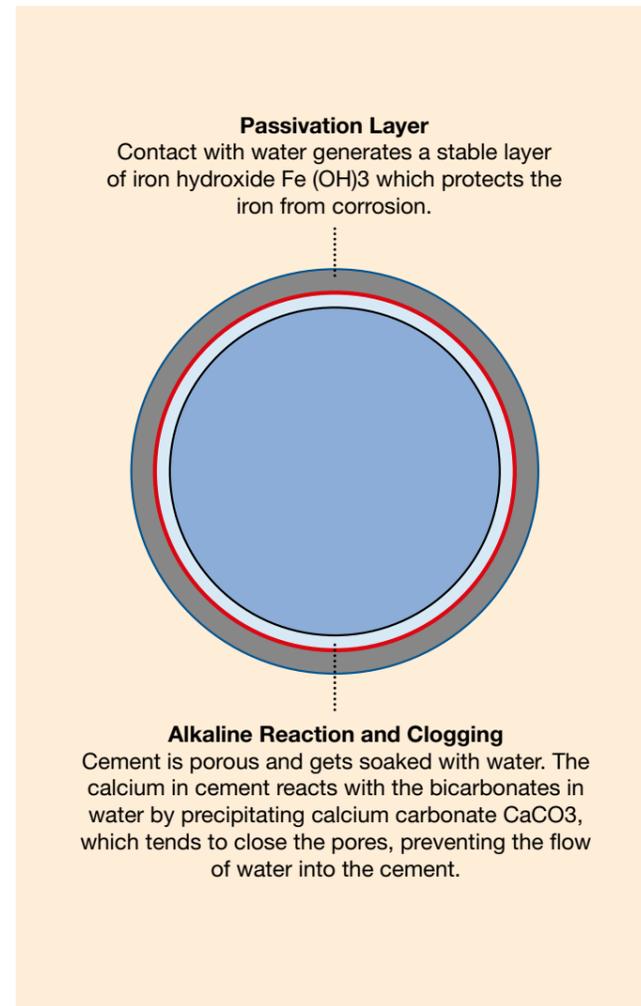
FRS RANGE

Category
Ductile
Iron Pipe

Application
Mining,
Fire protection service

Chemical Alliance

One of the surprising advantages of the internal mortar lining is that it is not only an obvious PHYSICAL protection, but also a CHEMICAL protection, as described in the figure below.



Product technical data

Size ϕ Nominal diameter	4"-12" / 14"-64"
Working pressure*	40Bar (600psi) / 25Bar (350psi)
Acidity resistance	ph 4 to 12
Absolute roughness (K abs)	0,030 mm
Hazen Williams coefficient (c)	140
Internal lining	Cement mortar, cement mortar with seal coat
External coating	Zinc Bitumen

*Higher pressures on request



Standard

- ANSI • AWWA C150 - C153 - C104 - C105 - C110 - C111 • ISO 4179 •

High temperature resistant

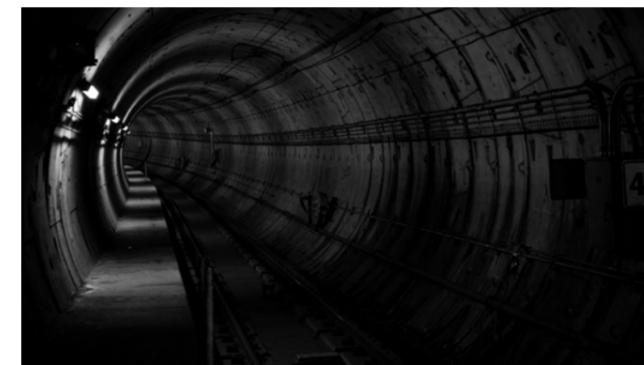
The **outstanding resistance** of ductile iron pipes to external and internal pressures make them **suitable for fire protection service**, and they are frequently installed inside road and railroad tunnels, airports and chemical and petrochemical facilities.

Certified material till 12" nominal diameter

*Bigger diameters on request

High diametral stiffness

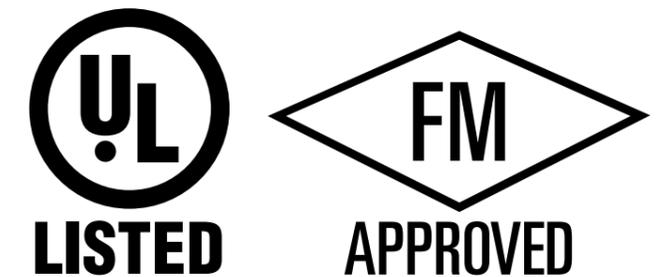
Ovalization resistance that allows heavy weight traffic loads over the trenches, even with small burying depths.



Product technical data

Size ϕ Nominal diameter	4"-12"
Working pressure*	17Bar (250psi)
Absolute roughness (K abs)	0,030 mm
Hazen Williams coefficient (c)	140
Internal lining	Cement mortar, cement mortar with seal coat
External coating	Zinc Bitumen

*Higher pressures on request



High pressure capability

Standard

- U.L listed • FM Approved •

Roughness

Mortar lining centrifugally applied offers an extremely **low roughness factor maintained over time**.

Ductile iron and steel fittings

Our pipe catalogue is completed with a **full range of ductile iron and steel fittings**.



Raw water transport

Full range of standard fittings available **for raw water or process water transport lines** with low abrasion resistance requirements. **Internally lined with cement mortar (CML) and seal coat and externally coated with Bitumen.** Alternative linings available to fit transported fluid requirements, for example, **ceramic epoxy**.

- 5°, 11°, 22°, 30°, 45°, 60° and 90° bends with double bell, bell and plain end, double plain end, double flange or flange and plain end configurations.

- Tees, crosses and Y pieces available with a wide end and diameter configuration alternatives.

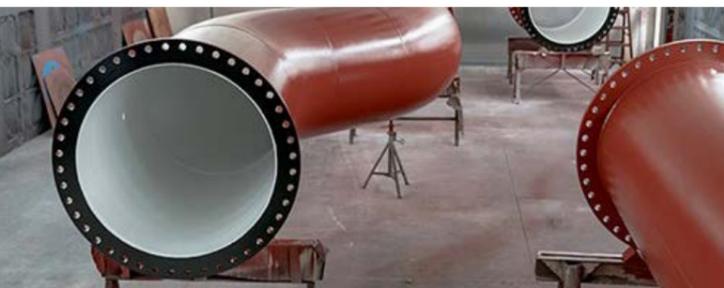


Slurry transport

Steel fittings available for use in **slurry** transport pipelines with **ANSI/ASTM/ISO flanged ends or plain ends, grooved or flat**, for connection to Victaulic or Tyton systems.

- **Long radius bends** (2D, 3D, 5D) flanged or plain ended
- Long body flange adaptors (1m)
- **Customized spools** with flanged or plain end with optional welded outlets

Flange specifications to customers needs. Internal high abrasion resistant ceramic epoxy lining with a full range of external coatings available (Zinc Bitumen, Ceramic Epoxy+R).



Raw water, process water and slurry valves

Wide assortment of **different configuration valves to meet customer's needs**

For **raw water lines** we offer a big range of gate valves, butterfly valves, air release valves, pressure reducing valves or over speed valves.

Different valve models with replaceable wear resistant sleeves **for water process or slurry transport lines**, to improve service life with a low cost and easy maintenance.



Quality is assured through the production process: raw materials, manufacturing processes and finished products comply with strict quality controls, tests and inspections.

All our products are accredited to International homologations such as ISO 9001 and NSF/ANSI 61

Providing the best product and service in the market is CONDUKMIN's main objective.

Certifications

Our **sales project quality system** is certified to *Quality-Plus!™ Certification Program*. This certification program assures that all the products fulfill with the necessary standards to be commercialized and implemented.



In conclusion, our products are manufactured to meet the highest requests.

Moreover, once the supply is over, we provide a **test certification** with each order containing metalographic results and pressure tests, in conformity with applicable international standards.



Construtec Duktıl

Founded in 1987, Construtec has 30 years of experience **designing fluid transport projects and supplying ductile iron pipes**. The company, expert in high complexity construction projects, offers innovative solutions together with top class partners.



CONDUKMIN: a trademark by Construtec Duktıl

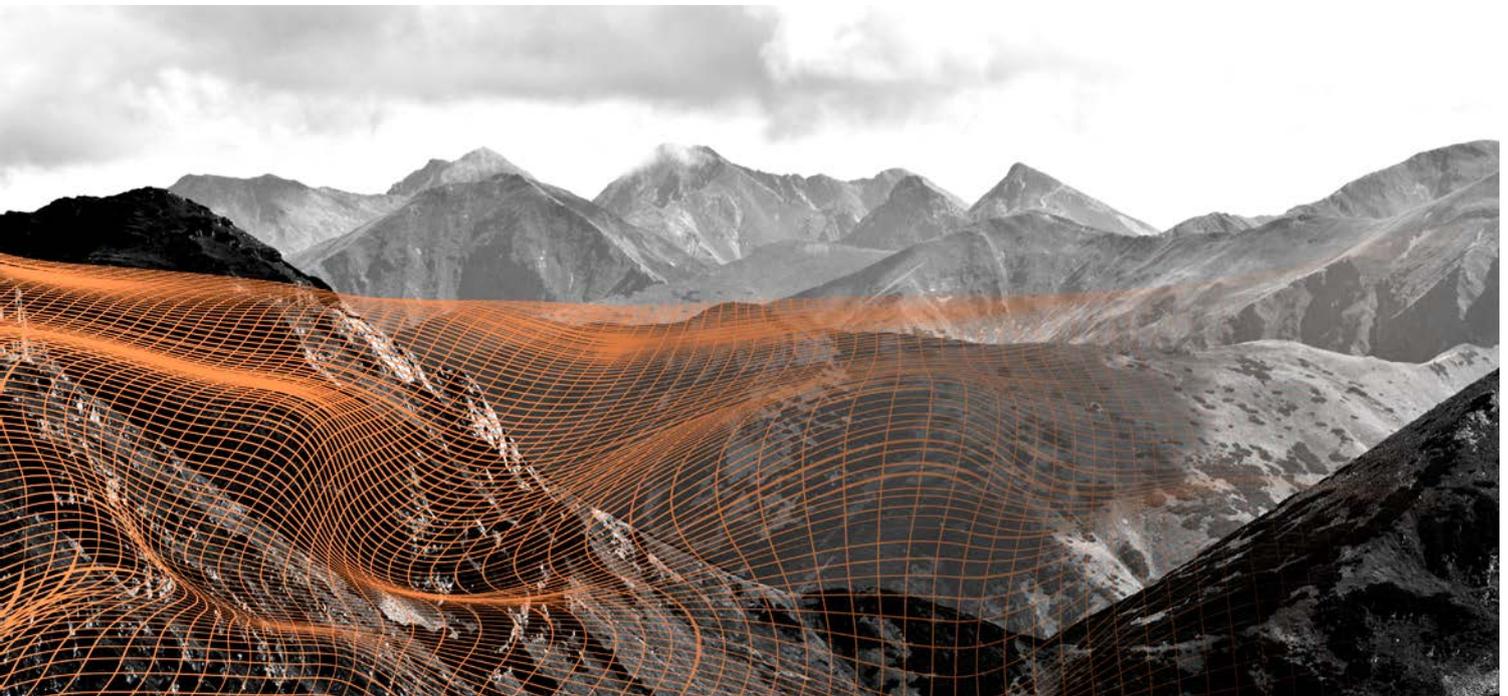
CONDUKMIN is created by **Construtec Duktıl to benefit the mining industry**. Pipeline project experience, study and design of real world projects, strengthen the R&D of the company, creating innovative products that bring added value to the mining sector.



Tailor made products for the mining industry

We offer a wide range of innovative products **with certified properties that provide high corrosion and abrasion resistance** for specific mining fluid transport.

Our products provide **huge advantages for fluid transport in the mining industry**, expressed in operative cost and installation and maintenance times reductions, with higher durability for the fluid transport system.



This is a commercial brochure so its technical information is not guaranteed.
For any specific application please contact our Technical Department (tecnico@construtec.com)

CONDUKMIN by **CONSTRUTEC**

Innovation in Mining Fluid Transport

Tel. (+34) 946 612 640

www.condukmin.com
info@condukmin.com

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