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Engineering a Better Solution

Maccaferri's motto is **'Engineering a Better Solution'**; We do not merely supply products, but work in partnership with our clients, offering technical expertise to deliver versatile, cost effective and environmentally sound solutions. We aim to build mutually beneficial relationships with clients through the quality of our service and solutions.

GLOBAL ENGINEERS

In the second half of the 19th century, we invented Gabions and dramatically changed the civil engineering landscape. We are still changing today. We work every day to find better solutions for our clients at every degree of latitude and longitude. Our worldwide network grows through innovation and diversification of sectors of activity and through an increasing range of high quality and environmentally friendly products and applications.

OFFICINE MACCAFERRI GROUP PROFILE

Founded in 1879, our Group soon became a worldwide reference in the design and development of advanced solutions, with offices in over 70 countries and 23 factories worldwide.

Our mission is to pursue excellence through continuous improvement, while delivering to customers engineered solutions that are innovative, advanced and environmentally friendly. We are committed to outstanding safety, quality and sustainability, to create value for all stakeholders as well as our communities.

MACCAFERRI APPLICATIONS

- RETAINING WALLS & SOIL REINFORCEMENT
- HYDRAULIC WORKS
- ROCKFALL PROTECTION & SNOW BARRIERS
- EROSION CONTROL
- SOIL STABILISATION & PAVEMENTS
- BASAL REINFORCEMENT
- COASTAL PROTECTION, MARINE STRUCTURES & PIPELINE PROTECTION
- ENVIRONMENT, DEWATERING & LANDFILLS
- DRAINAGE OF STRUCTURES
- TUNNELLING
- LANDSCAPE & ARCHITECTURE
- SAFETY & NOISE BARRIERS
- FENCING & WIRE
- AQUACULTURE NETS/CAGES
- CONCRETE FLOORING, PRECAST & OTHER USES
- INDUSTRIAL MANUFACTURING

MACCAFERRI

MACCAFERRI

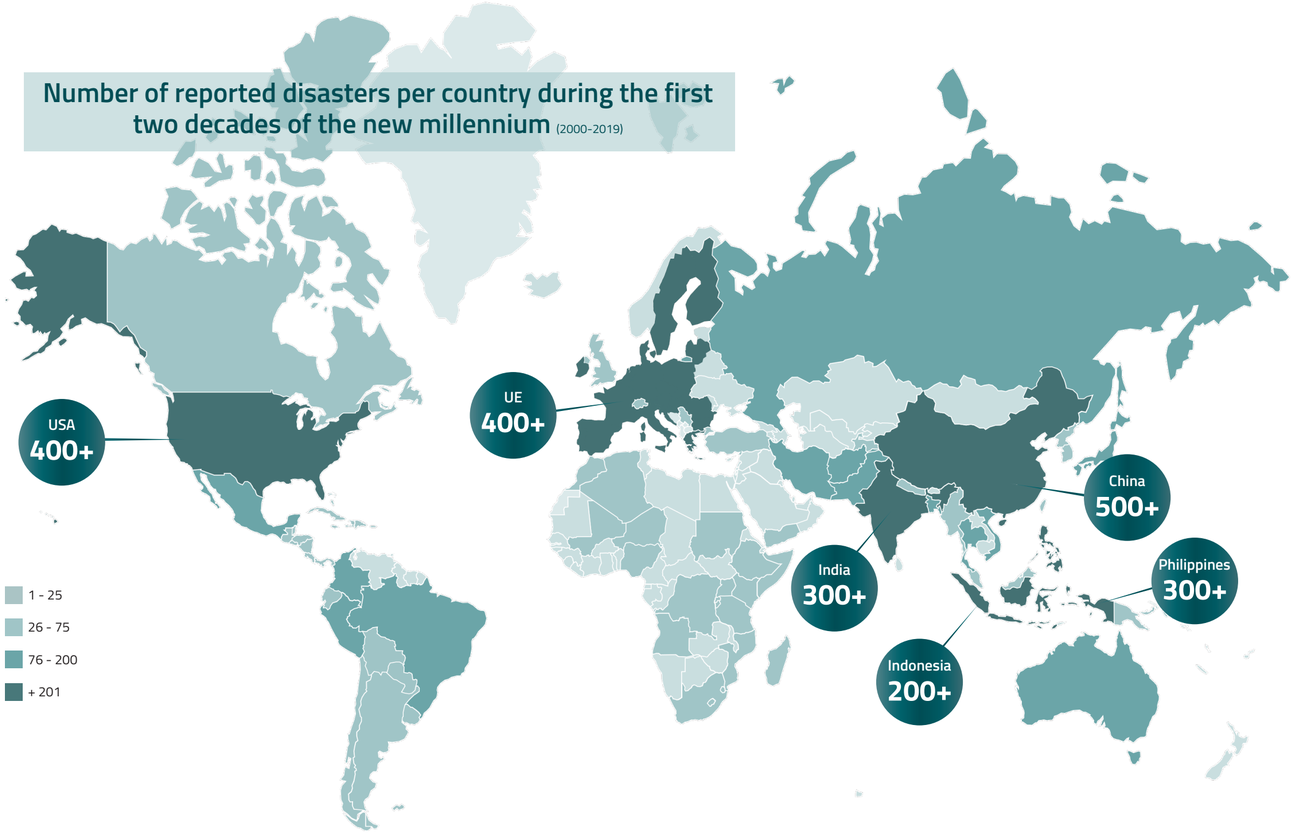
EMERGENCY WORKS

EMERGENCY WORKS

In recent years, the **frequency** and **intensity** of floods, landslides, tsunamis, and coastal erosion **have increased significantly**. These natural disasters often interact closely, occurring **simultaneously** or **triggering one another**, leading to amplified damage and loss potential.

As a result, it is paramount to **prioritize prevention**, **preparedness**, **response**, and **recovery activities** to effectively address these challenges. **Swift** and **efficient responses** are crucial for restoring affected regions to their original state, **mitigating damage**, and **facilitating the process of rebuilding and restoring lives**. These efforts are vital in protecting individuals, communities, economies, governments, and the global systems we rely upon.

Number of reported disasters per country during the first two decades of the new millennium (2000-2019)

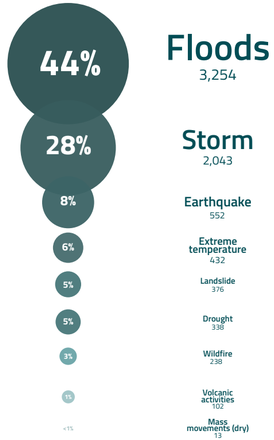


+7K
DISASTERS

+4B
PEOPLE AFFECTED

~3T US$
ECONOMICAL LOSSES

Percentage of occurrences of disasters by disaster type (2000-2019)



HUMAN COST OF DISASTERS
An overview of the last 20 years (2000 - 2019)
UN Office for Disaster Risk Reduction

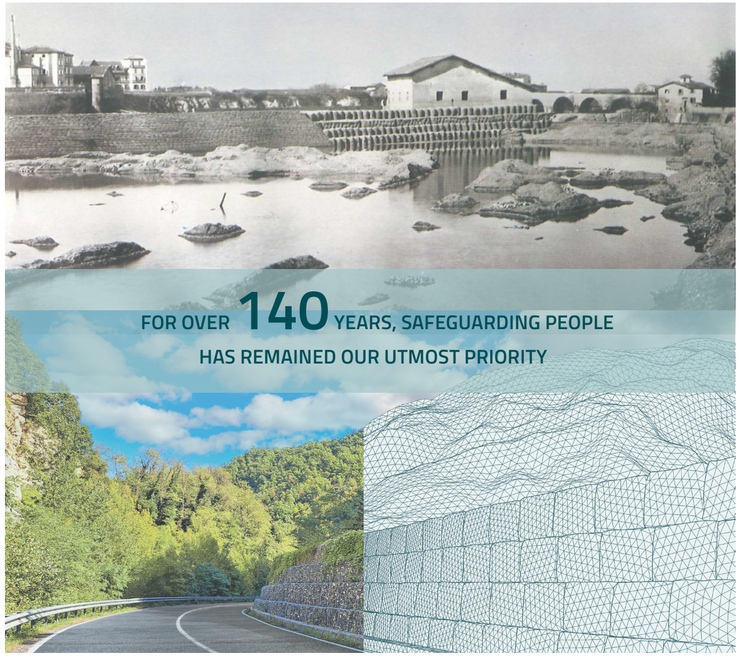
UNDRR
UN Office for Disaster Risk Reduction

MACCAFERRI TOWARDS DISASTER RECOVERY

Our experience in **disaster recovery** dates back to the 1890s when we provided **emergency repairs** for a breached dam at Casalecchio di Reno. This dam played a **vital role** in **supplying water** to power the industries of Bologna, making them heavily dependent on it.

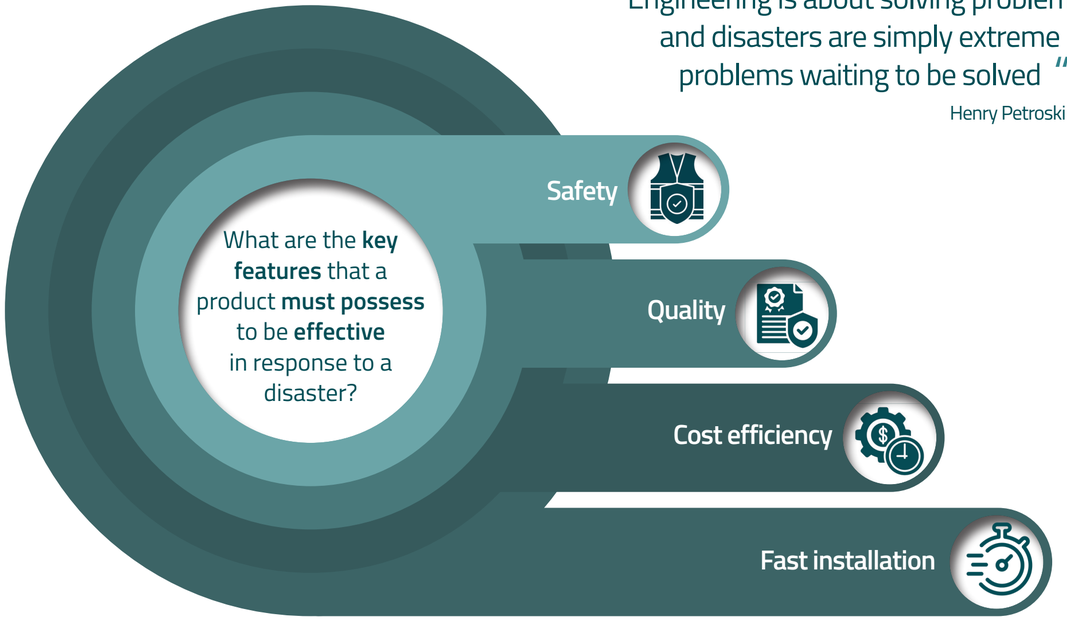
Our expertise has **expanded** over the years, offering **tailored solutions for critical situations.**

We not only focus on recovery but also **prioritize monitoring and prevention**, providing **comprehensive solutions** and **early warning systems** to mitigate the impact of disasters. By combining our **expertise** in **recovery**, **monitoring**, and **prevention**, we offer clients a **holistic approach to emergency** management, ensuring their **long-term safety** and **resilience**.



" Engineering is about solving problems, and disasters are simply extreme problems waiting to be solved "

Henry Petroski



FLEXMAC

FlexMac is the ideal solution for **flood emergency situations**, thanks to its versatility and rapid deployment capabilities.

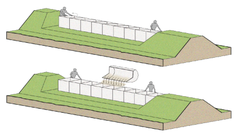
This **multicellular structure** is constructed with double-twist wire mesh reinforced with vertical steel bars. FlexMac is internally lined with geotextile, allowing it to be filled with locally available materials, expediting the installation process and minimizing associated costs.

Once installed, FlexMac serves as a **barrier** against water passage, protecting people and structures from flood events.

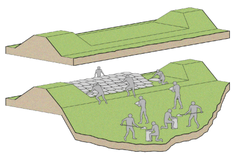
Its foldable structure is designed for easy handling and storage, enabling quick deployment and the reusability of FlexMac in future emergency situations.

- **Flexible and light for easy transportation**
- **Rapid and simple to deploy**
- **Fast and intuitive to connect with adjacent modules**
- **Practical and sustainable by utilizing locally available materials**
- **Resealable and reusable**

FlexMac vs SandBag

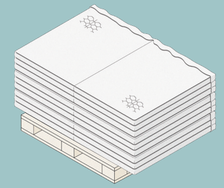


FlexMac		SandBag
3	hours	3
4	people	30
60	meters	10



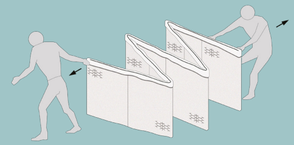
DEPLOYMENT AND INSTALLATION

1. Delivery of modules on pallets



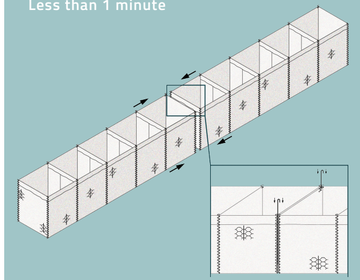
2. Opening of individual modules

2-3 people



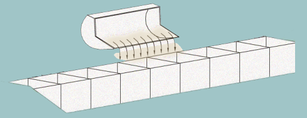
3. Connection of modules

Less than 1 minute



4. Fill with escavators

Just one worker



CUBIMAC

CubiMac is a ready-to-use solution ideal for building hydraulic and geotechnical structures in **challenging** and **time-constrained areas**.

Constructed with double-twist wire mesh and protected with the innovative PoliMac® coating, CubiMac are **preassembled** and **pre-filled modular structures** equipped with a tested lifting system and CE marking, ensuring ease and safety of installation.

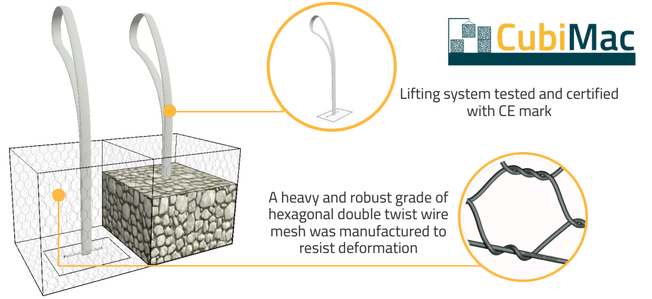
Its versatility allows for the construction of structures in various configurations, making it suitable for **landslide restoration** projects as well as for **delineating risk zones** or **underwater installations** at any depth. CubiMac guarantees safety, reliability, and effectiveness for all critical emergency intervention projects.

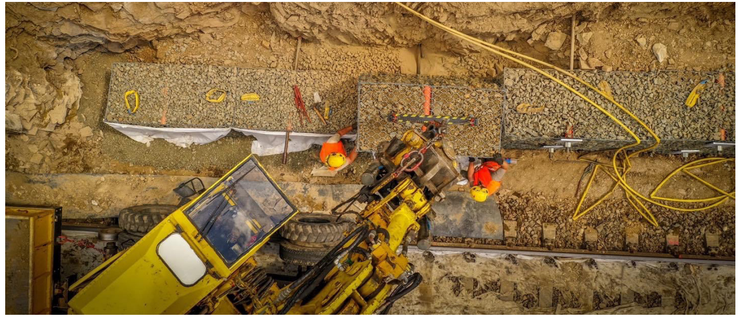
Pre-filled and ready to use

Certified and safe to deploy

Practical and installable in hard-to-reach areas

Elevable and re-usable





READYMAC

ReadyMac offers the ideal solution for **quick** and **efficient restoration** of infrastructure impacted by landslides and soil movements.

These collapsible, mono-anchored containment structures are designed specifically to facilitate transportation, even in disaster-stricken areas.

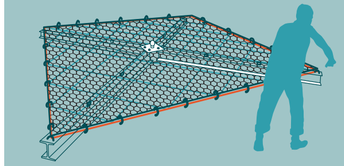
Specially engineered for rapid and safe intervention, these **preassembled** structures are particularly suited for quickly stabilizing slopes and creating emergency roads and tracks, providing unparalleled efficiency and ease of installation.

An important strength of ReadyMac is its **configurability**: the available ranges allow for meeting all project-specific requirements. Additionally, its customizable facing allows for seamless **integration** into the surrounding landscape and environment.

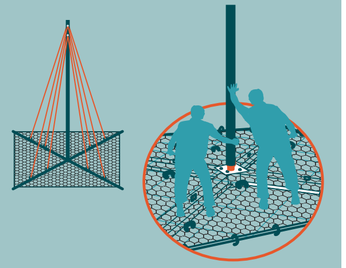
- Rapid and simple to deploy
- Practical and sustainable by utilizing locally available materials
- Fast and safe thanks to reduced drilling activity
- Transportable and installable in hard-to-reach areas
- Versatile and configurable according to project needs

DEPLOYMENT AND INSTALLATION

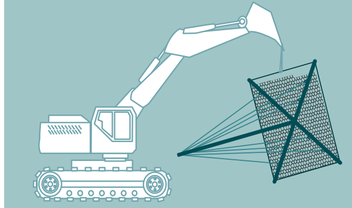
1. Opening of units
Minimum labour requirement



2. Quick assembly



3. Storage



SAFEMAC

Rockfall poses a significant risk to the safety and integrity of infrastructure and individuals. Following heavy rainfall, the risk of hydrogeological instability increases, leading to material detachment from rock walls and slopes.

SafeMac barriers are modular systems that allow for easy and quick installation to mitigate low-energy impacts. They are designed and tested to minimize construction operations and do not require drilling during the anchoring phases to the foundation soil, enabling placement even above New Jersey-type concrete barrier structures.

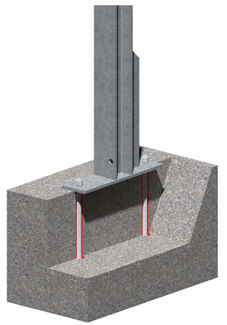
Subjected to an extensive testing campaign, SafeMac barriers meet the highest safety standards.

- **Efficient and cost-effective**
- **Rapid and simple to deploy**
- **Optimized and long-term performing**
- **Fast and safe thanks to reduced drilling activity**
- **Lightweight and easy to handle**

All our **Low Energy Barriers** have been **developed** and **tested** with three different configurations for the posts and lateral foundations:

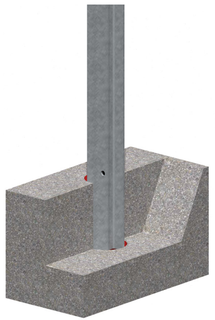
Standard configuration

with 2 anchors
(for soil or rock)



NP configuration

no plate at the base of the post
(for soil or rock)



CW configuration

with 4 anchors
(for concrete wall)

HELLOMAC

HELLOMAC is an **alert system** designed to prevent potential negative impacts on communities due to hydrogeological instability phenomena.

By utilizing a combination of sensors, detection technologies, and real-time data analysis, the HELLOMAC system provides **timely warnings** to local communities and authorities, enabling them to take **preventive** and **mitigation measures** to protect human lives and properties.

HELLOMAC can be easily installed by non-specialized personnel; with a few operations, the area to be monitored can be equipped with sensors, strengthening community resilience. For this purpose, HELLOMAC can be used to closely **monitor** the hydrogeological conditions of **vulnerable areas** that have already been affected by instability events, in order to promptly alert affected individuals in case of new potential risks such as landslides, floods, or other related events.

Easy and safe to install without need for on-slope wiring activities

Connected and functional in remote areas without phone coverage

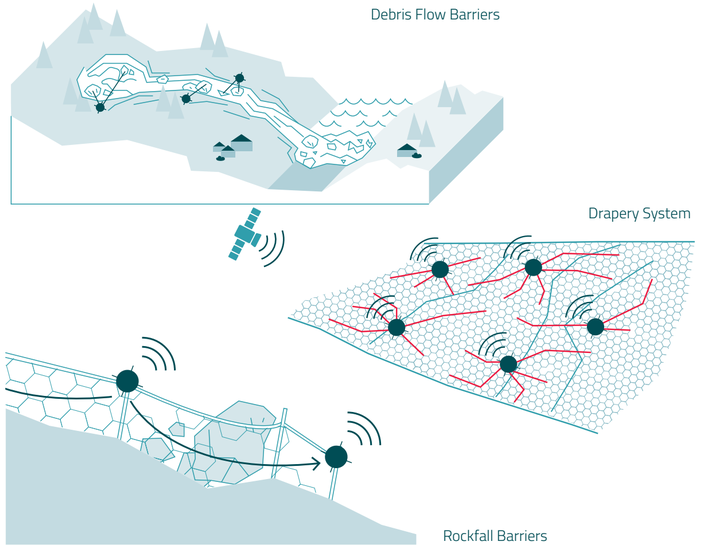
Self-sufficient and sustainable without external power supply

Reliable and durable without the need for maintenance

Adaptable and compatible with pre-installed sensor systems

HELLOMAC
MAKE YOUR ROCKFALL PROTECTION SMARTER

The **Hellomac system** can also be **accessorized** with a range of devices for **personal safety** and **territorial monitoring**:



Local alarms and commands

In case of an event, a preset limit for a specific indicator is exceeded and HELLOMAC can automatically activate traffic lights, signals, sirens and gates.

Strain Gauges

HELLOMAC's strain gauges detect millimeter displacements and send data to the software via the Hubir concentrator.

Inclinometers & underground water level

HELLOMAC's inclinometers and piezometers detect movements and groundwater level changes, transmitting measurements to the software via the Hubir concentrator.

Rain Gauge and surface water level

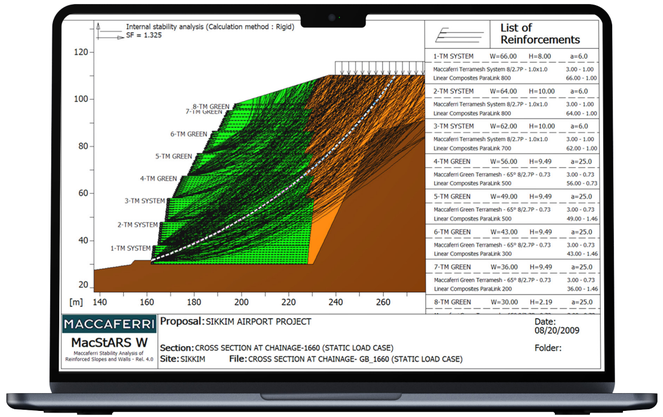
The warning can be sent remotely via messaging, app, or on-site alarms through Hubir. It is easy to install and works with water level measurements or as a standalone rainfall instrument.

SOFTWARE AND CERTIFICATIONS

Our suite of software **meets the requirements** of the civil and geotechnical engineers **around the world** while also **offering** additional benefits of **cost-effectiveness** and **improved buildability**

Within our software suite, engineers can select the **most up to date and certified products** (e.g. BBA and CE marked) to be used within their retaining wall, reinforced soil slope/wall and other complex civil engineering projects.

Try out our applications at **edesing.maccaferri.com** or download them from our website.



WORLDWIDE ACCEPTANCE & PROVEN RELIABILITY

USER-FRIENDLY INTERFACE

BUILT-IN LIBRARY OF CHARACTERISTIC VALUES OF PRODUCTS TO BE USED FOR THE DESIGN

PoliMac®

WIRE PROTECTION FOR A CHANGING WORLD

12x Better resistance to abrasion, including installation damage

4x More performance in cold weather

4x More resistance to UV rays**

2x More resistance to chemical aggressions*

* In terms of resistance to sulphiric, nitric, formic, acetic acids
** In terms of elongation after 2500 hrs of exposure

Our products undergo a **rigorous** and **continuous test campaigns** in compliance with **international** and **national standards**

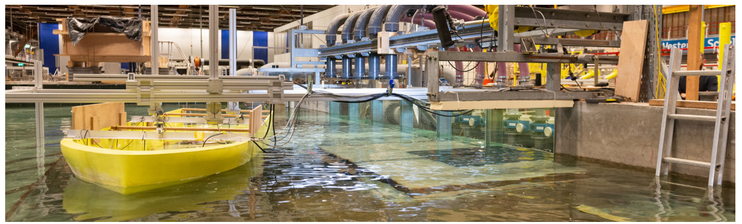
BBA — Approval on the product quality including testing in laboratories, onsite evaluations, quality management checks and inspections of production.

ETA n. 16/0767 CE 1301-CPR-1220 — Continuous control of product performance in compliance with EU legislation.

bimstore — Our products are available as BIM object on maccaferri.com/BIM. The use of BIM object improves design and construction processes, preventing on-site operation inaccuracies.

EPD® THE INTERNATIONAL EPD® SYSTEM Certification Number S-P-01465 — Our products achieved the Environmental Product Declaration (EPD), an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products.

* Each product within Maccaferri Portfolio might have a different set of product certifications. Ask our local subsidiary to know more



360° SPECIALIZED SUPPORT

Maccaferri works every day to find **better** and **sustainable solutions** for our stakeholders at every degree of latitude and longitude.

We are proud to **collaborate** with l**eading global research institutes** and **universities** around the world to guarantee the **highest quality** in terms of engineering support to our clients and quality of our entire product portfolio.

- **Long-standing experience** in the selection and design of solutions to mitigate natural hazards
- **The widest portfolio** of solutions tested and certified by the most important international bodies
- **Specialised on-site assistance** during project execution

"From the design stage of an engineering system going through the manufacturing and construction phases until dismission: all of our engineering solutions aim at creating long-term benefits that go beyond the product itself."