Officine Maccaferri
Group Profile

Founded in 1879, Officine Maccaferri soon became a technical reference in the design and development of solutions for erosion control and retaining structures. Since then, through technological innovation, geographical expansion and focussed diversification, Maccaferri now offers solutions at a global level for a wide range of civil and environmental engineering applications.

Consultancy and Partnership

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.

Organisational Structure

Officine Maccaferri is at the heart of the Maccaferri Industrial Group. Its continued growth is based upon long-held values of innovation, integrity, excellent service and respect for the environment. Maccaferri’s vision is to become a leading international provider of advanced solutions to the civil engineering and construction market. Implementing a strategy of vertical integration, Maccaferri researches, manufactures, designs, supplies and constructs solutions within its target markets. The capability of the business continues to expand due to a strategic plan to open new markets and grow existing ones; Maccaferri now offers advanced engineered solutions from beach nourishment to reinforced soil structures and rockfall mitigation to tunnelling systems.

With over 2000 employees, 26 manufacturing facilities and local operations in 100 countries around the world, Maccaferri can truly claim to have a global presence with local focus.

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- Edmonton, AB: (780) 447-2719
- Montreal, QC: (514) 426-1845
- Halifax, NS: (902) 468-8615

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This brochure is part of a series of publications with the purpose of presenting Maccaferri’s range of solutions. Further technical brochures, documentation, design guides, software and project Case Studies are also available. For over 130 years, Maccaferri has solved our clients’ geotechnical and engineering problems, from evaluation and project definition to design and construction, we continually accumulate experience and knowledge in this field.

For additional information or other technical publications, please contact any Maccaferri office.

Although there are great differences between the mining and civil engineering industries, the engineering challenges are similar; Maccaferri’s solutions are applicable to both sectors.

Mining is one of the oldest human activities; the first traces of activity are over 40,000 years old. The business of modern mining follows strict environmental, operational and remediation guidelines. These ensure that the mined area can recover to at least its original condition, and often better in many cases.

Wherever your problem exists within the lifecycle of the mine, Maccaferri products and solutions can help. From access and materials handling infrastructure, rockfall hazard mitigation, product concentration and leachate storage, to dewatering and site remediation, please contact Maccaferri.

For 130 years, Maccaferri has developed innovative, sustainable engineering products and solutions. Maccaferri engineers offer technical support including analysis, design, product selection and installation supervision. Maccaferri are your project partners every step of the way.
This is where minerals (previously deposited in the leachate) receive treatment according to their subsequent use. Be it an underground mine or an open-cast mine, minerals are extracted through the drilling of solid rock. Water use is necessary in the various stages of the cycle of a mine and this is where it is treated and recycled.

Mineral Extraction Zone
Be it an underground mine or an open-cast mine, minerals are extracted through the drilling of solid rock.

Treatment Zone
This is where minerals (previously deposited in the leachate) receive treatment according to their subsequent use.

Leaching Zone
Minerals are extracted from the rocks through a chemical process. In order to carry out this process, the minerals need to be placed into properly prepared areas. The results of this process are collected in two areas: in the pool storage are the leached minerals and in the tailings dam are the residues.
Operating underground encompasses the necessary processes and applications of specific techniques to extract valuable minerals. Maccaferri offers numerous solutions to line tunnels to control loose and falling debris that often occurs during mining operations. Depending on the specific risks, these solutions include steel or polymer meshes, or fibre reinforced shotcrete.

Maccaferri’s high strength Pararib™ tunnel lining polymer mesh is white in colour, flame retardant and light to handle in confined areas. Wirand steel and polymer fibres are added to pumped shotcrete to reinforce it and provide stabilisation of shafts and adits and can even replace the traditional steel mesh. Rapid to install, these solutions minimise disruption to the extraction operation.

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### Project Experience

**Passac Mine**
- **Location**: Junin, Peru
- **Mining Company**: Compania Mineria Argentum S.A.
- **Project Date**: 2007
- **Solution**: Shotcrete reinforced with Wirand FS3N steel fibre

**Industria Carbonifera Rio Deserto**
- **Location**: Laura Muller, SC, Brazil
- **Mining Company**: Industria Carbonifera Rio Deserto
- **Project Date**: 2003
- **Solution**: Surface support of pillars using double twist steel mesh

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*Image courtesy of Minova Weldgrip*
An opencast or open-pit mine is used to extract valuable deposits close to the earth’s surface. Here the fragmentation, loading, materials handling and production control require heavy equipment. To maximise extraction volume and minimise the space for infrastructure, slopes within these mines can be steep. Material can detach from these slopes affecting mine safety and operations. Maccaferri’s solutions address these problems with a range of high performance steel meshes and rockfall catch fences rated to 5000kJ impact resistance. Rockfall protection embankments for greater impact protection are also available.
The treatment process consists of the operations after mineral extraction and until a concentrated mineral is produced. Numerous phases can include, fragmentation, graining, milling, classification and concentration. At each stage, Maccaferri offers solutions such as reinforced soil and retaining structures for crusher and hopper walls. Wherever possible, the reuse of site-won structural backfill is used with Maccaferri’s geogrids for reinforced soil, reducing costs and material waste. Maccaferri’s concrete panel wall system, MacRes® offers vertical structures with a tough fascia and with geogrid strengths up to 1350kN/m, even the heaviest vehicles can be accommodated.

For the concentration stage, waterproofing systems and lagoon structures are required to contain the concentrate, thereby avoiding infiltration into the natural ground and potential contamination of aquifers.

**RAPID CONSTRUCTION PROCESS**
The safe storage of tailings, waste, leachates and toxic materials is a significant operation within mines. Maccaferri’s range of solutions includes geosynthetic membranes, geogrids and drainage geocomposites. These are used in heap leach pad liners, evaporation ponds and lagoon linings. Containment dykes often feature geogrid reinforced soil or gabion retaining structures and major dump zones can be supported on basal reinforced platforms.

MacTube® geotextile tubes are used for dewatering mine tailings, sludge ponds or slurries. They are specifically designed to retain solid particles within the tube, whilst the filtrate fluids are released through the fabric. The drained solid residue can be left to dry before disposal in a controlled manner.

**Storage Process**

**Project Experience**

**Cobriza Mine**
Huancavelica / Churcampa, Peru
Mining Company
Doe Run Peru
Project Date
2006
Solution
Drainage, separation and impermeable linings to lagoons using MacDrain®, MacTex® and MacLine® respectively

**Goldex Mine, Peru**
Paralink™ basal reinforcement of storage area.

**Goldex Mine, Canada**

**Dewatering Process**
Effective access ramps, haul roads, surface water control structures and drainage systems are important to the uninterrupted performance of a mine.

Whether a weak haul road requires sub-grade stabilisation with geogrids, an outfall structure requires erosion protection, or a run-off ditch needs lining, Maccaferri can help based on our 130 years of experience in civil, geotechnical and hydraulic engineering.
ANCASH MINE
Ancash, Peru
Mining Company
Antamina Mining
Project Date
2009
Solution
Rockfall protection embankment for conveyor station using Terramesh™ and MacGrid®

CUAJONE, PERU
Moquegua, Peru
Mining Company
Southern Peru
Project Date
2006
Solution
Containment dyke retaining structure using gabions

RUBICON PIT
Australia
Mining Company
Barrick (Australia Pacific) Ltd
Project Date
2010
Solution
Rock slope surface stabilisation and rockfall hazard mitigation using PVC coated double twist rockfall mesh

MOGALAKWENA MINE
Limpopo, South Africa
Mining Company
Anglo Platinum
Project Date
2009
Solution
Rockfall mitigation drapery using double-twist rockfall mesh
Finally, the closure of the mine and the reinstatement of the ecosystem is one of the most important activities in the life of the mine. Maccaferri offers impermeable capping and drainage systems to prevent surface water entering the deposits. The rapid re-establishment of vegetation and soil erosion protection systems complete the closure operations. Maccaferri’s wide range of man-made and biodegradable soil stabilisation and erosion protection solutions facilitate this.

Maccaferri’s Research and Development and Technical departments, have advised their customers at each stage of the construction process, from design to construction supervision, in many of the works shown in this brochure. Maccaferri engineers are available to provide technical advice on existing solutions or to assist in the search for solutions that employ new technologies.