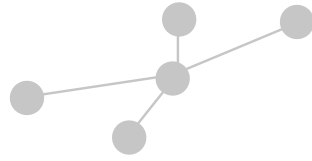




UNDERGROUND TECHNOLOGY



TECHNOLOGY AND CHEMISTRY FOR CONSTRUCTIONS



Maplad is a company active in the construction industry, specializing in materials for underground construction, concrete and high quality infrastructure construction.

Long experience and continuous growth in the market have increased Maplad's know - how by boosting its expansion through the use of cutting-edge technologies in the production of fiberglass profiles, sodium silicates, concrete admixtures and cement premixes.

The company researches the most modern solutions and materials to meet the needs of various application areas: from underground works to long-term construction, industrial applications and design on its customer's request.

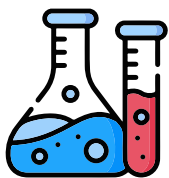




Technical assistance

We offer our customers a broad service aimed at the knowledge and application of our products through constant and extensive assistance at all stages of construction: from design to installation. The service offered on the construction site - the spearhead of the company - is what gratifies us most. Technicians, who are present throughout the country and in the foreign countries manned, are able to put the requests of the construction site in constant contact with the Technical Department and laboratories, which, in turn, are able to respond fully to the customer's needs.

The experience gained, product quality, service reliability and expertise have earned Maplad numerous industry awards. By choosing Maplad as your trusted partner, you will discover all the benefits of a first-class service and consulting network.



Research and development

Every year we invest a considerable portion of our profits in research and innovation. In fact, there are numerous development projects through which existing technologies and products are constantly improved. The quality and cutting edge of our products are the result of the economic and human resources expended on research, as the most suitable solution to the customer's problem is fundamental to us.

Building the present with the future in mind.

Upgrading and training sel personnel is the basis for the quality of Maplad products. Our production facilities have chemical and mechanical laboratories equipped for quality control of the finished product. We also collaborate with public research organizations, universities and private individuals. Always attentive to issues related to environmental pollution, we also invest considerable resources in experimenting with low-pollution materials and/or from waste recycling.



Network

Through our sales offices, warehouses and logistics centers, and with the support of our partners distributed in numerous countries, we are able to guarantee direct technical and commercial support with the customer, internationally. We are present in Europe, America, North Africa and the Middle East. Partnerships with dealers are based on technical knowledge that can give maximum support from design to product selection to the ability to intervene during site operations. We have created and formed a network of technicians and partners capable of dealing with different global markets. This is the driving force behind our internationalization.

We stay close to the customer by providing our knowledge.



Fiberglass bolts and anchors for slope and face stabilization

Fiberglass profiles for consolidations and nailing soils of excavation fronts during the realization of tunnels and underground works. The high tensile strength and low shear resistance of the profiles allows their destruction using the most common excavation equipment, very quickly, safely and economically.



iBAR ROCKBOLT

GFRP rock bolt
with solid or tube section

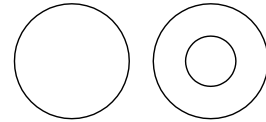


GFRP profiles with unidirectional glass filaments, produced with a solid or tube cross section and preformed enhanced adherence, capable of guaranteeing constant adherence with the anchoring cement mortar.



ADVANTAGES:

- Continuous thread
- High and load



APPLICATIONS:

- Excavation with traditional method
- Temporary application
- TBM face support
- Soil Nail



ACCESSORIES:

- Steel Coupling (1) - Centralizer (2)
- GFRP Nut (3) or Steel Nut (4)
- GFRP Plate (5) or Steel Plate (6)

iBAR SELFDRILLING

GFRP self drilling rock bolt
with high torque performance

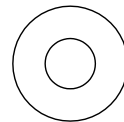


Self-drilling rock bolts with high torque performance, well-engineered products and highly resistant to pressure during harsh environment. These special rock bolts can be easily cut and surely will ensure optimum usage in tunnelling and rock stabilization without compromising space.



ADVANTAGES:

- High torque resistance
- Easy handling
- High end load



APPLICATIONS:

- Excavation with traditional method
- Temporary application
- TBM face support
- Soil Nail



ACCESSORIES:

- Steel Coupling (1)
- GFRP Nut (3) or Steel Nut (4)
- GFRP Plate (5) or Steel Plate (6)
- Bit (7)

iPIPE 60/40

GFRP pipe for face stabilization
diameter 60mm t.10mm



Glass fiber reinforced plastic pipe with a circular cross-section, an outside diameter of 60 mm and thickness of 10 mm, with an enhanced-adherence outer surface created by helical milling.



ADVANTAGES:

- High end load
- Easy handling
- Easy injection
- Easy cutting



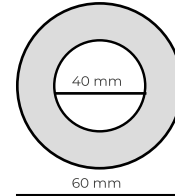
APPLICATIONS:

- Excavation with traditional method
- Face bolting



ACCESSORIES:

- Pointy cap (8)
- Retractable Valve (9)
- Manchette Valve (10)
- Coupling (11)



IES 40s

Structural system with 3 GFRP flat profiles
and thermoplastic polymer pipe



Structural element made up of three glass fiber reinforced plastic flat profiles, assembled using spacers on the PE or PVC injection pipe. The pipe may be blind or with a valve. The enhanced adherence is obtained by quartz sand or an irregular surface created during the production phase.



ADVANTAGES:

- Flexibility
- Easy handling
- Easy injection
- Easy shipping



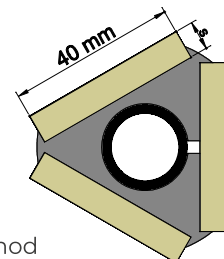
APPLICATIONS:

- Excavation with traditional method
- Face bolting



INNER TUBE INJECTION:

- Polyethylene 20/16
- PVC 34/27 with manchette valve
- PVC 48/40 with manchette valve



MULTINJECTION

GFRP consolidation system
for face bolting
Patent n°0001420985



GFRP reinforcement device for consolidating, stabilizing and reinforcing soil during tunnel excavations, with localized conduction function of consolidating expansive mixtures. Composed of a central fiberglass element, obturator bags, and injection tubes.



ADVANTAGES:

- Large consolidation area
- Soil recompression
- Control of consolidating levels individual areas
- Low shear strength
- Can be used with resin and expansive mixtures
- Confined injections



APPLICATIONS:

- Excavation with traditional method
- Face bolting



iMICROPILE

GFRP micropile for
soil-retaining walls



Pipe produced with polyester resin and glass fiber using pultrusion technology. The dimensions, such as the cross section and length, depend upon design requirements.



ADVANTAGES:

- Chemical resistance
- Reduction of excavation times



APPLICATIONS:

- Provisional supporting work
- Traditional soil-retaining walls

ACCESSORIES



1
Steel Coupling



2
Centralizer



3
GFRP Nut



3
GFRP Nut



3
GFRP Nut



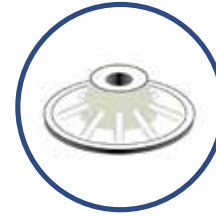
4
Steel Nut



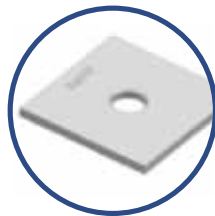
5
GFRP Plate



5
GFRP Plate



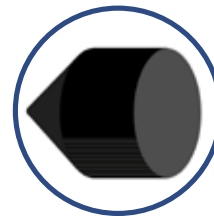
5
GFRP Plate



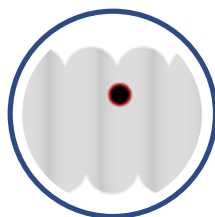
6
Steel Plate



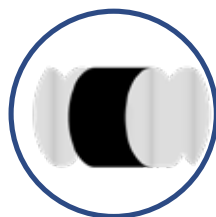
7
Bit



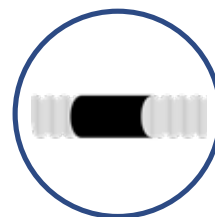
8
Pointy cap



9
Retractable
Valve



10
Manchette
Valve



11
Coupling



GFRP concrete reinforcement

Reinforcement composed of fiberglass bars and stirrups, capable of replacing classic cages made of steel elements, either temporarily or permanently.

In the construction of tunnels with the use of TBMs, the special mechanical-physical characteristics of these products (high tensile strength and low shear strength) allow reinforcing the concrete of temporary diaphragms while maintaining high performance, not creating obstacles to the milling head. Crossing the diaphragm will be done quickly, without change of equipment and in total safety.

The resistance to corrosion and chemical attack of FRP profiles increases their durability, making them ideal for permanent structures built in aggressive conditions.



iBAR

GFRP rebar



The reinforcing rebar consists of a multitude of continuous fibers, oriented in the direction of load, bonded by a polyester or vinyl ester resin matrix. The surface is characterized by a ribbing that increases the resistance to pulling-out.

IBAR BENDED

GFRP stirrup



Frp stirrups are made by bending a bundle of resin-impregnated fibers. Subsequently, these raw bars are heat-cured. This procedure allows a high fiber content and near-parallel fiber alignment, thus providing high strength and a modulus of elasticity similar to that of straight bars. Steels can be produced in 2d (e.g., z-shapes, circular and rectangular) and 3d (spiral).



ADVANTAGES:

- Corrosion resistant
- High tensile strength
- Low weight
- Easy cutting



APPLICATIONS:

- D-Wall
- Building foundation
- Soft-eye
- Waterway Engineering
- Exposed Structures



SERVICE:

- Design
- Assembling

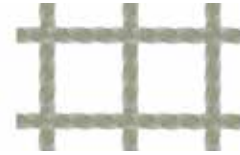
FRP systems for tunnel safety

Division dedicated to GFRP products designed and manufactured in order to reduce the risks in tunnels resulting from the conventional use of steel. These products and systems made by Maplad have the advantage of being very light, easy to install, and most importantly resistant to corrosion and galvanic.



iMESH

GFRP mesh



Fiberglass mesh made by assembly of iBAR. The reinforcing bar consists of a multitude of continuous fibers, oriented in the direction of the load, bonded in a resin matrix. The assembly of imesh is made with metal or plastic bindings, such as to ensure the strength of the sheet and continuity of strengths.



ADVANTAGES:

- Corrosion resistant
- High tensile strength
- Low weight



APPLICATIONS:

- Repair of corroded structures
- Shotcrete reinforcement
- Temporary application



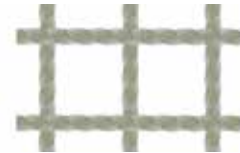
ACCESSORIES:

- GFRP connector



iMESH 1P

GFRP monolithic mesh



Fiberglass mesh, free of bindings, but made monolithic by interlacing the longitudinal bars. The interlacing between the bars is achieved through a manufacturing process developed by Maplad. This ensures the continuity of mechanical properties, perfect positioning of the bars, and solidity of the mesh.



ADVANTAGES:

- No steel
- High flexural strength



APPLICATIONS:

- Repair of corroded structures
- Shotcrete reinforcement
- Temporary application



ACCESSORIES:

- GFRP connector

HANDRAIL R60

GFRP handrail for railway use



Fiberglass pultruded profile made of thermosetting resins with high fire resistance and E-glass fibers. HANDRAIL R60 is used in tunnels to increase the level of safety in escape routes.

The profile is mounted through steel or fiberglass bracket.



ADVANTAGES:

- Low weight
- Non-electrical conductivity
- Corrosion resistant
- Fire resistant
- High durability



APPLICATIONS:

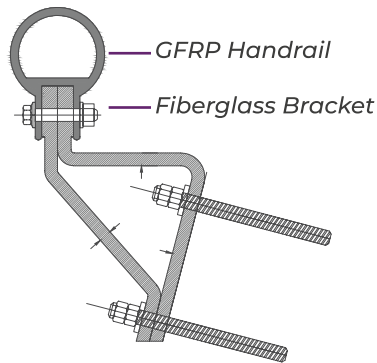
- Installed to improve safety in the tunnel



ACCESSORIES:

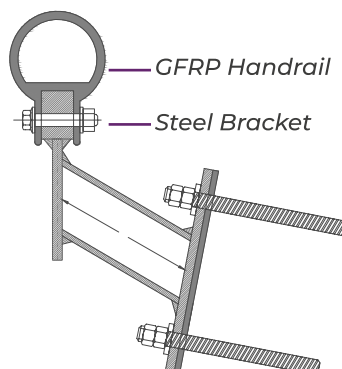
GFRP Bracket:

Fiberglass bracket for installation of HANDRAIL R60 on tunnel walls. The special section allows easy attachment through 1 or 3 points, which provides resistance to horizontal and vertical stresses. The fiberglass bracket has the advantage of being dielectric and highly durable



Steel bracket

Handrail bracket made of steel subjected to hot-dip galvanizing treatment to prevent physical and chemical attacks on the surface. It is possible to attach the plate to the wall through 1 or 3 points.



GFRP ASSEMBLED SYSTEMS

Maplad designs, manufactures, and assembles systems composed of pultruded fiberglass profiles. The characteristics of these materials are: high mechanical strength, corrosion resistance and being dielectric. This makes GFRP systems appropriate for railway applications. The systems are manufactured according to the customer's design.



ADVANTAGES:

- UV resistant
- Corrosion resistant
- High tensile strength
- Non-electrical conductivity



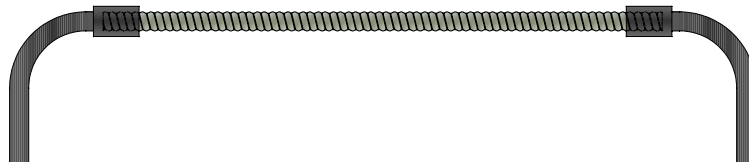
APPLICATIONS:

- Railways
- Waterway Engineering
- Exposed Structures



iCHAIN

GFRP chain
for metal ribs



iCHAIN is a system for connecting metal ribs having the characteristic of creating a discontinuity so as to avoid galvanic currents and provide electrical insulation between metal ribs. It consists of a fiberglass element, dielectric with high mechanical performance, connected at the ends to curved metal elements.



ADVANTAGES:

- Corrosion resistant
- Galvanic current resistant
- High tensile strength



APPLICATIONS:

- Tunnel with metal ribs

Shotcrete accelerators

Maplad manufactures alkaline and non-alkaline shotcrete accelerators, which differ according to chemical and physical characteristics and the degree of final finish required from the product. The production process is monitored, constantly by specialized personnel, at all stages and this ensures high quality and performance standards.



SILICASIL SS/AC 38

Liquid accelerator for shotcrete
based on sodium silicate

Liquid alkaline setting accelerator obtained by dissolving glass flakes, it is a widely used and easy to apply product for the production of shotcrete.



ADVANTAGES:

- Very fast setting times
- Considerable reduction in concrete rebound



APPLICATIONS:

- Shotcrete
- Safety of the excavation face
- Consolidation of unstable soils
- Underground structure

S/2 SYSTEM

Plasticising setting accelerator for shotcrete

Two-component plasticising additive with high cohesiveness and thixotropicity for shotcrete with high mechanical performance.

S/2 SYSTEM consists of a Component A, a plasticising powder additive, to be mixed in the concrete mix and a Component B, a sodium silicate-based setting accelerating additive, to be used in the shotcrete phase.



ADVANTAGES:

- Greatly improves the plasticity of concrete
- Considerable reduction in concrete rebound
- Considerable reduction in dripping in tunnels
- Increased mechanical performance of shotcrete



APPLICATIONS:

- Shotcrete in the presence of water
- Safety of the excavation face

MALKALI-301

Non-alkaline setting accelerator for shotcrete

Very effective alkali-free liquid accelerator for shotcrete.



ADVANTAGES:

- Very fast setting time
- Non-aggressive product
- Improves safety in use



APPLICATIONS:

- Shotcrete
- Safety of the excavation face
- Consolidation of unstable soils
- Underground structures

Additives for Backfill

Additives produced by Maplad are designed to fill the annular gap between the soil and the tunnel lining to allow the TBM to advance. Their use makes it possible to prolong the hydration process by delaying initial and final setting times and improve strength by dispersing cement particles.



TBM SYSTEM

Two-component additive for backfill

Two-component cement grout injection system specifically formulated for consolidation of the back segment cast with TBM.

The system consists of two components that are added to a normal cement mixture of water and cement:

RETARD 72 Retardant and fluidizing additive based on high molecular weight polymers designed to increase the workability of cementitious mortars or grouts for injection, up to 72 hours after preparation.



ADVANTAGES:

- Maintenance of workability in mortars for up to 72 hours
- Absence of segregation during storage.

SILICASIL TS/AC 32 A sodium silicate-based setting accelerating admixture specially formulated to accelerate the setting time of grout, used in TBM excavation, for backfill.



ADVANTAGES:

- Reduces the setting time of the grout after injection
- Low viscosity to decrease reaction time
- Unchanged effectiveness even in the presence of free water in the soil

Expansive cement, mortars and mixtures

Expansive mortars are composed of mixtures of the highest quality hydraulic cementitious binders and expansive agents that, mixed in the right proportions, in water produce a superfluid, highly expansive mortar.



ESPANMIX 30/70/100

Expansive cementitious mixture

The ESPANMIX product line consists of single-component cement mixtures that, when mixed in water, increase their volume relative to the injected volume. Depending on the user's needs, this line offers different solutions in terms of final expansion



ADVANTAGES:

- Controlled expansion
- High fluidity of the mixture
- Total expansion of the mixture within 60 minutes



APPLICATIONS:

- Grouting of threading or nailing in tunnel or underground applications
- For injection of compaction into soils during tunnel excavations



ESPANDEX 100 AD

Expansive additive for making mortars for use in anchoring and soil consolidation

A single-component powder additive for use in making high-expansion, bleeding-free mortars.

Its expansive action due to the formation of microbubbles of gas in the cement mixture results in a final expansion factor in the mortar that can reach up to 100 percent by volume within 60 minutes.



ADVANTAGES:

- Choice of percentage expansion rate.
- Controlled expansion
- High fluidity of the mixture



APPLICATIONS:

- Grouting of threading or nailing in underground applications
- Injection of compaction into soils during tunnel excavations
- Filling by pouring or injection of cavities or lesions in rock or soils



Office and Factory
Via Cosmo Mollica Alagona
snc Blocco Palma II - Zona Industriale
ITALY - Catania 95121

www.mapladindustry.com

follow us:   