



SHOTCRETE

Solutions for Tunnelling and Mining



**SAFE. COST EFFECTIVE.
SUSTAINABLE TECHNOLOGY.**



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Disclaimer: This information has been provided as a guide only for specific conditions only. The reader is advised to undertake their own evaluation to determine the suitability of the information provided for any particular project or use prior to commercial use.

OUR TEAM. YOUR TEAM.

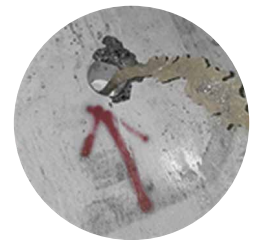
Focused on innovation and sustainability, MAPEI is a **leading global producer** of specialty construction chemicals and materials for the underground tunnelling and mining markets.

The Underground Technology Team (UTT) is a division of MAPEI, dedicated specifically to underground works with **more than 20 years of on-site underground construction experience**. Our global network of highly trained technical service staff are at your disposal to assess each project on a case-by-case basis to fulfill the technical requirements of the project.

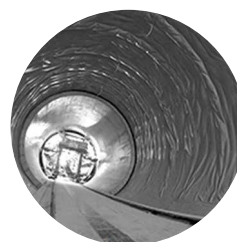
MAPEI UTT's product range comprises 6 core product lines which include:



**Shotcrete
and Concrete
Technologies**



**Injection/
Consolidation/
Anchoring**



Waterproofing



**Concrete Protection
and Final Coatings**



**Concrete Repair
and Rehabilitation
Technologies**



**Mechanised
Tunnelling**



**FOCUSED ON
INNOVATION AND
SUSTAINABILITY.**

SAFE. COST EFFECTIVE. SUSTAINABLE TECHNOLOGY.

Mapei's **PREMIO** system was developed for the purpose of **minimising dosage rates** and operational costs, while **maximising technical performance**, safety of the end user and the **security of local ecology**.

The improved performance offered with the system can be attributed to the highly **advanced formulations** of the products which are designed to work best as a complete system.

These include:

- High-Range Water Reducers—**Dynamon**
- Hydration Control—**Mapetard**
- Fibre Reinforcing—**Mapefibre**
- Set Accelerator—**Mapequick**

SAFE TECHNOLOGY

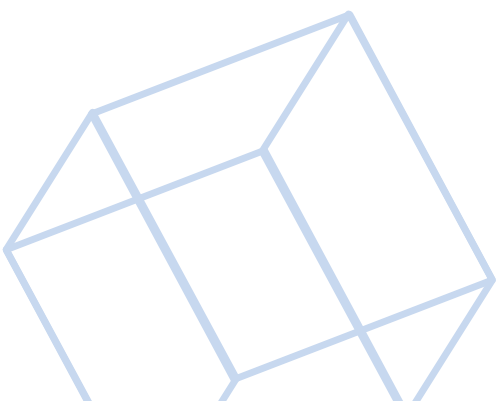
Certified according to the highest official standards, our specialty shotcrete system has been developed to achieve **safe re-entry** in less time due to rapid strength gain.

COST EFFECTIVE

MAPEI UTT team will customize the mix design according to the specific requirements of the project using our world class laboratory resources. With the PREMIO system tailored specifically to the project specification, a **lower dosage rate** is needed to obtain the required performance.

SUSTAINABLE

SUSTAINABLE production of materials and encouragement of best industry practices – The ability to offer the best and most innovative solutions to help design and construct according to eco-sustainable principals is a fundamental commitment for Mapei. To date the Mapei group has **offset over 50,000 tons of CO₂** and every year invests **5% of annual turnover into the development of new eco-sustainable products**.





CUTTING EDGE SHOTCRETE ADMIXTURES

ADVANCED FORMULATION. BIG RESULT.

There are many characteristics of shotcrete that can be modified with the addition of **specialty admixtures** and Mapei has the answer to obtain project specific performance requirements.

In our experience, the most commonly occurring mix designs don't require an over complication. Mapei can offer:

- A cohesive flowing mix with excellent pumpability in the plastic state
- Long working time with excellent slump and flow retention
- High range water reduction with low admixture dosage.





ALKALI-FREE ACCELERATORS





Mapequick AF-70

Mapei's unique alkali-free shotcrete technology has been optimised to produce high-performance versions of **Mapequick** to meet the specific requirements demanded by the harsh ground conditions and leading EHS expectations:

ADVANTAGES

- **Fast re-entry**—Rapid strength gain without compromising the late age strength
- **Fast cycle times**—Superior adhesion and rapid setting allows high build rates
- **Cost effective dose rates**—Effective formulation reduces consumption
- **Minimal rebound**—Low dust and reduced wastage
- **Safe for the nozzleman and the environment**—The alkali free technology ensures the safety of the nozzleman and the security of local ecology.

A POWERFUL COMBINATION

Mapetard

Hydration control & mix stabilisation (SRe)

Mapetard range is an advanced solution with the capacity to delay the hydration of cement and, therefore, maintain the workability of shotcrete in hot climates or when transported over long distances to the nozzleman.

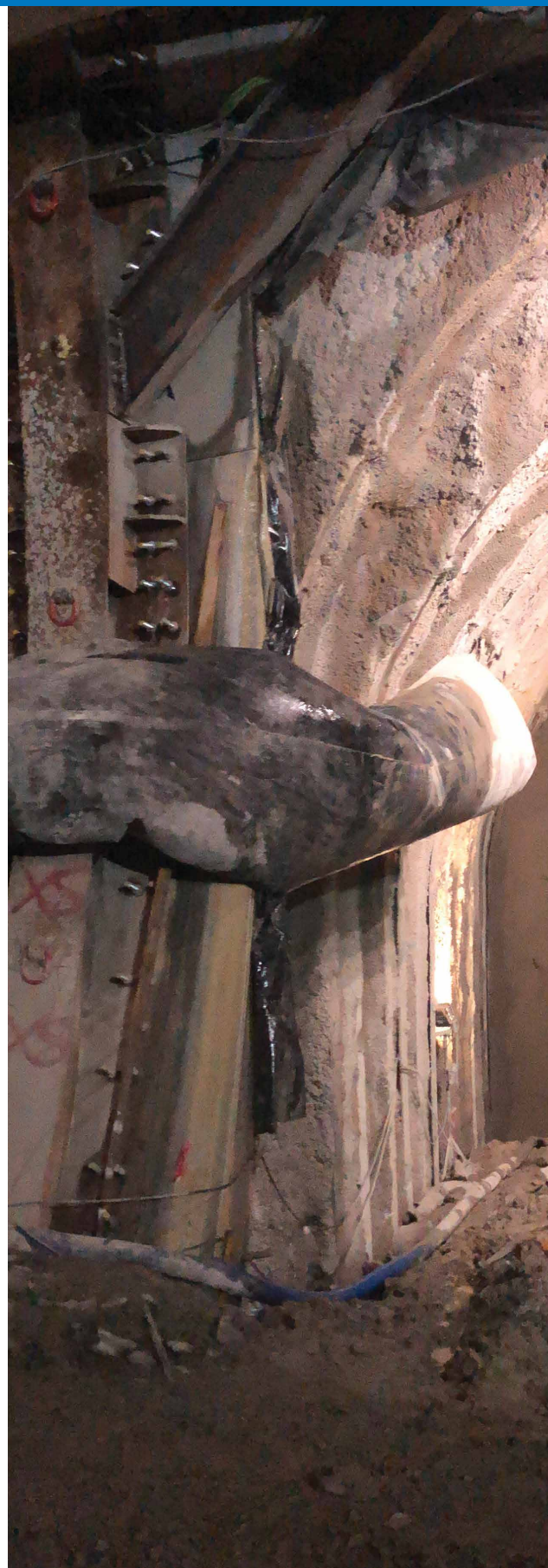
NON CAUSTIC. NON CORROSIVE.

Dynamon

High range water reducer (HRWR)

Dynamon range is a finely tuned Polycarboxylate (PCE) HRWR. Mapei was infact the first company to produce this technology in Europe, patenting the first product in the **Dynamon** range in 1994.

**HIGH RANGE WATER REDUCTION
& RHEOLOGY OPTIMISATION**





FIBRES

MAPEFIBRE RANGE



MB 65

Colour	Transparent Orange
Length	65 mm
Diameter	0.85 mm
Appearance	Embossed
Melting Point	160°C
Density	0.91 kg/m ³
Tensile Strength	540 MPa
Modulus of Elasticity	5500 MPa
Packaging	Pucks in pulpable bags



BG 55

Colour	Off White
Length	55 mm
Diameter	0.8 mm
Appearance	Embossed
Melting Point	165°C
Density	0.92 kg/m ³
Tensile Strength	>550 MPa
Modulus of Elasticity	5000 MPa
Packaging	Pucks in pulpable bags



DURABLE SHOTCRETE

WITH SUPERIOR POST CRACK DUCTILITY

Conventional steel reinforcement technology for concrete and shotcrete structures is vulnerable to corrosion, difficult to handle and install together with a high carbon footprint.

With these issues in mind, we have directed a substantial proportion of R&D investment to further advance structural macro synthetic fibre technology (MSF) to replace steel reinforcement in concrete and shotcrete structures. These activities have led to the development of the new **Mapectibre** range.

ADVANTAGES

- **Better mixing and homogeneous distribution without balling**—All fibres are supplied in easy to handle soluble pucks and packaged in pulpable bags.
- **Excellent pumpability**—Thanks to the optimised fibre density and length
- **Safe and easy to handle**—compared with the use of steel fibres, MAPEFIBRES are lightweight and safe to touch
- **Noncorrosive and chemically inert**—in case of contact with fire the polypropylene of MAPEFIBRES decompose into carbon dioxide and water
- **Cost effective**—Thanks to the low dosage per Joule, lower transport costs and easier handling and storage

IN THE LAB AND ON-SITE

Our world-wide network combines the joint knowledge of over **20 years of project support**, with locally available engineers and concrete technologists to deliver a **localised service with global support** from the beginning to the end of the project.

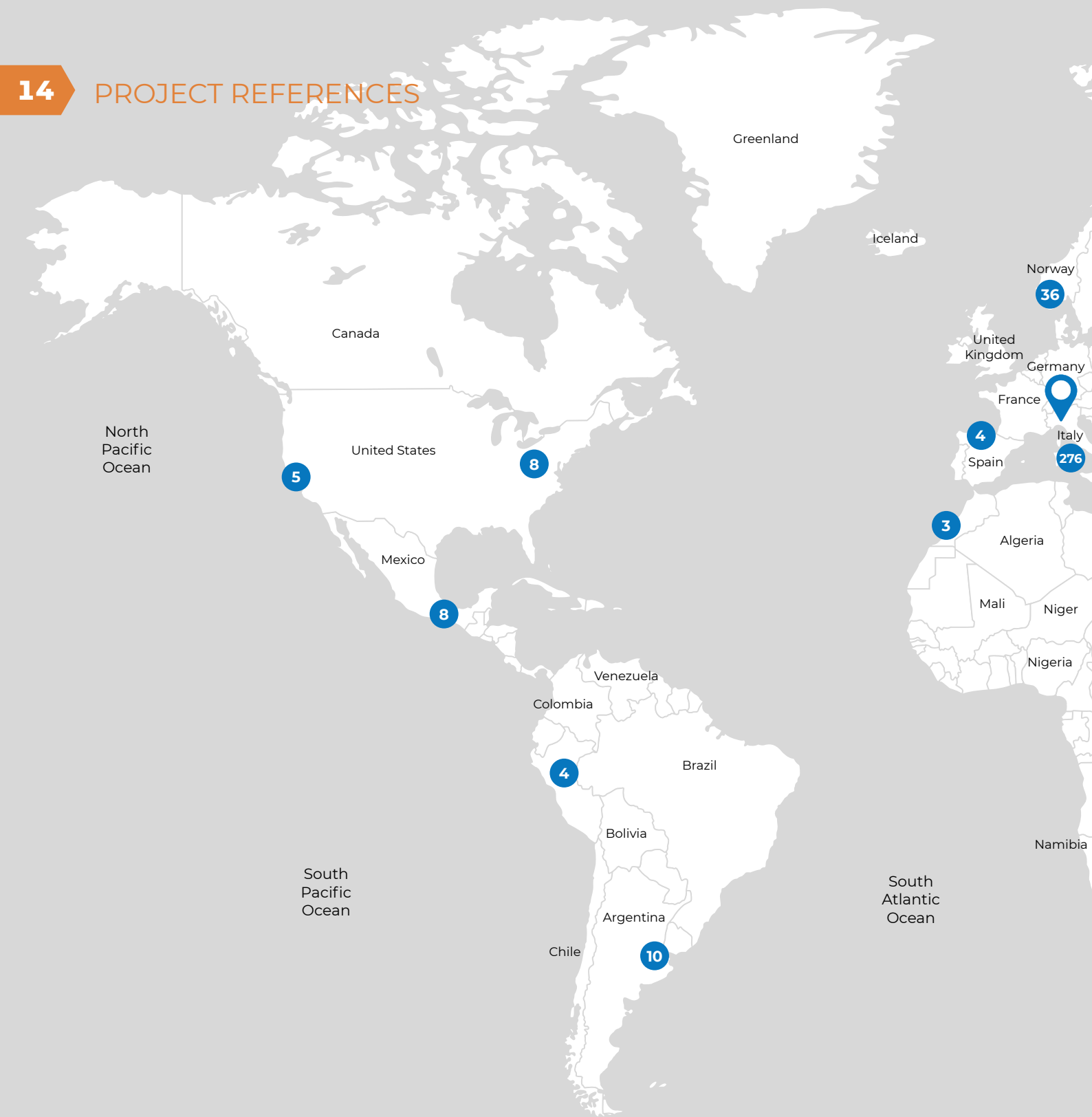


Our team can unlock the full potential of your mix with the integration of our state-of-the-art technology and technical service:

- Raw material evaluation
- Customised mix designs
- Site trials
- On-site training.



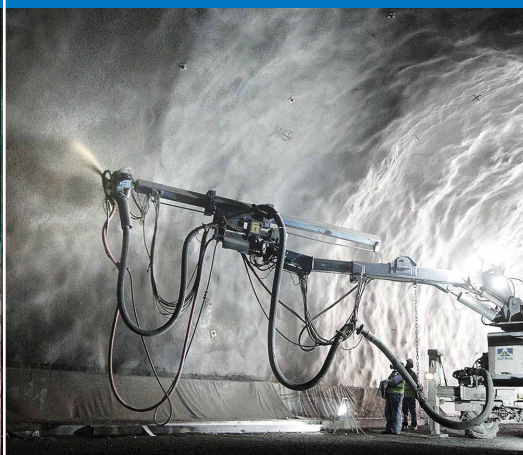
14 PROJECT REFERENCES



Rivarolo Tunnel
Italy



Sharjah-Khor Fakkan Tunnel
U.A.E.

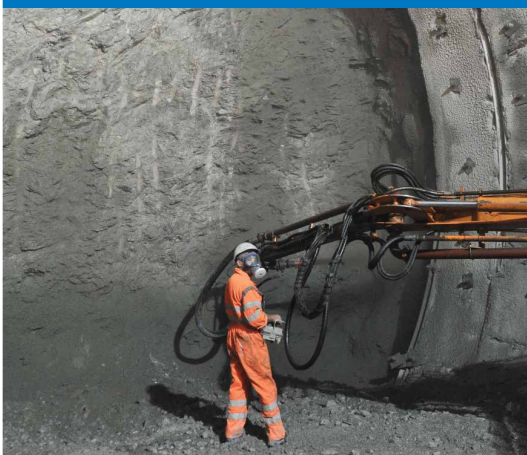


Standard Gauge Railway
Tanzania





Alptransit Ceneri Base Tunnel Switzerland



Toven Tunnel Norway

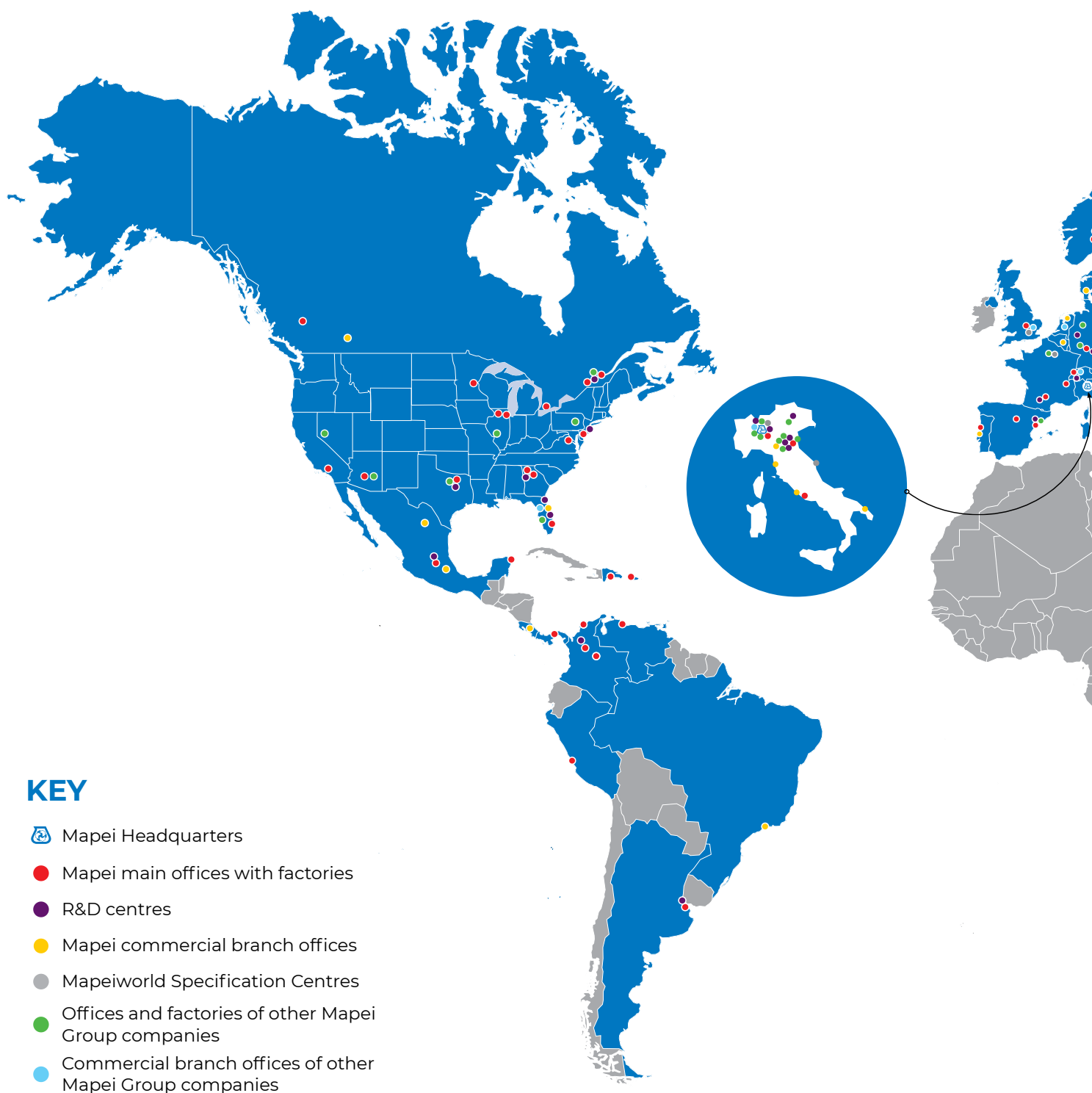


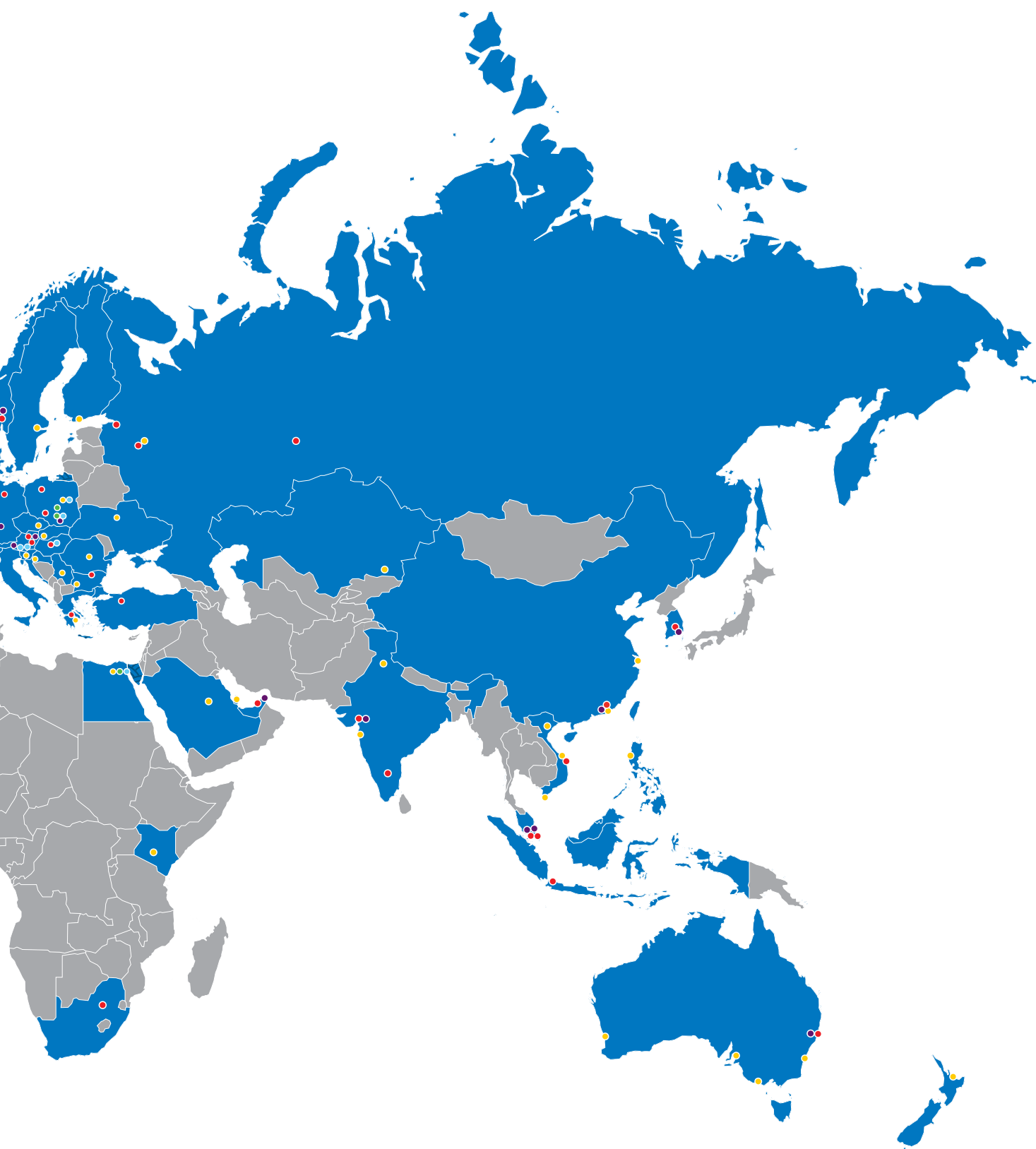
North Connex Sydney



THE WORLD MAP BECOMES INCREASINGLY BLUE.

84 plants, 91 subsidiaries, to be fast, efficient and **competitive** on the market.





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