



World Press(ure)

It's the manufacturer from Piacenza that is "under pressure", due to the ongoing orders for its batching systems and motor pumps. The path of the major building works goes from Austria to Hong Kong, passing through the endless roads of the Australian plains

Who says that Europe is no longer able to amaze the world with large infrastructural projects conceived under the banner of the most sophisticated engineering in the building industry? The Austrian Wienerwald Tunnel is a tangible demonstration of how the question posed at the beginning is strictly rhetorical, considering this 13.35 km (about 9 miles) long and very modern railway tunnel, which crosses the Danube and the mountains in the northern part of the Wienerwald region, between Gablitz and Mauerbach. It is a true technological marvel, an integral part of the new railway connection between Vienna and St. Pölten, along a total distance of 60 km (37.26 miles) conceived by the Austrian Western Railway, integrating the Austrian's capital's new main station.

The work is exceptional, no doubt, but the realization of similar "miracles" should never be seen as the result of a single genial idea. In this case, Italy has carried out its part as a protagonist, contributing with its know-how and equipment, provided by Metax - division of CIMA S.P.A., the company from Piacenza known throughout the world for the production of specialized high-pressure pumps for special foundations. For the Wienerwald construction site, Metax prepared a large number of machines, including batching plants, injection pumps and storage tanks; a crucial "team" especially for the definition of the most important 11 km stretch (6.83 miles) of the Wienerwald Tunnel, starting from the western slopes by means of the *bi-tube* type (a single tunnel dedicated to each of the two rails, while the whole tunnel for the two

rails has been provided for only for the remaining 2.35 km [about 1.24 miles).

On the European Train

The excavation of the *bi-tube* tunnel began in autumn 2005, through two big

Herrenknecht TBM (Tunnelling Boring Machines), and was completed two years later.

The next step was the building and consolidation of the structures until February 2010. Once the works concerning the

actual part of the railway were concluded, the Austrian National Railways (ÖBB) opened the high-speed tunnel on December 9, adding the "corner stone" to the railway connection between Vienna Meidling and St. Pölten.



The Wienewald tunnel construction site in Austria. Metax has played a key role in the transportation of cement mixture into the tunnel, providing different types of its injection pumps

A worldwide synergy

The international vocation of Metax took flight in 2002, when the company became part of the CIMA S.P.A., an industry group that includes three pre-existing business realities that were part of the same property. CIMA S.P.A. is actually the mother company, founded in 1961 (production of metal structures and equipment for the cement industry and the construction industry), to which two other companies were added: SICOM, created in 1977

(production of special fittings, pipes and flanges obtained from calendered sheets for the piping, petrochemical, energy, gas and water sectors) and Metax, founded in February 1987 (batching and mixing plants and high-pressure pumps for the geotechnical sector and the consolidation of the subsoil). In particular, Metax has kept its registered trademark that distinguishes the Geotechnical Engineering Division of the Group.





The construction works of new underground stations in Rio de Janeiro, here that of Nossa Senhora da Paz. Metax participated with its equipment at different construction sites, in particular by providing different types of motor pump MP7

Metax supplied 14 injection pumps, 12 IC90s and 2 IM90Ss to the construction site: They are single-piston double-acting modules primarily designed for injecting binary, ternary or quaternary cement mixtures (with water / cement ratio up to a maximum of 1/2) at a medium-low pressure (3 to 60 bar for IC90 pumps) and a medium-high pressure (30 to 200 bar for IM90S units). In order to supply the mixture to the tunnel, the

**Brisbane, Hong Kong,
Rio De Janeiro: the
technology of the
company from Piacenza
has no boundaries and
requests come from
construction sites
around the world**

Italian company also supplied the construction site with two IM190S mono-piston double-acting modules, used for the injection and transportation of the mixture itself on long distances (up to the density of 1.8 kg/dm³). In fact, these pumps are equipped with a hydraulic control system that allows the line to be kept under pressure without needing a return line, and above all, without having to stop the system.

Metax has combined a fully automated JM30 batching plant (also equipped with a manual mode) to the injection pumps, installed in a container and dedicated to the production of cement mixes for the injection works inside the tunnel. Finally, to support the activities, a storage tank type JA3 with a vertical axis agitator was also supplied; the tank's function is to maintain the mixture during the mixing phase, avoiding settlement or solidification. The mechanical action of the double set of blades allows the liquid to be mixed intensely in order to achieve greater homogeneity. The storage tank is equipped with a vertical pump provided with a bypass circuit for the recirculation of the mixture inside the tank itself. The pump's function is to boost the injection pumps and other construction equipment installed downstream of the tank.

For the "underground" construction site

The Wienerwald Tunnel is just one of many international construction sites that Metax has supplied with products with exclusive technology. The Metax MP7 motor pump is, for example, one of the most requested types for land consolidation works, where high and constant pressures are needed. The special construction solutions make this machine the ideal equipment for the execution of jet-grouting injections. This sophisticated machine is frequently used for works related to groundwater transportation. Recently, various types of MP7 motor pumps were used on construction sites for new underground stations of line 4 in Rio De Janeiro, while others MP7s were shipped to Hong Kong for the con-

**The injection pumps
Metax transport
the mixture into
the prodigious
Wienerwald tunnel**

struction of other stations recently added (particularly in the Sham Shui Po District) to the dense network of lines of the world's busiest underground.

The MP7 motor pump is a module that can be equipped with different optional components, according to the customer's needs: from centrifugal booster pumps on wheels and with an electrical control panel, to data logger devices up to remote controls. For example, in the assembling and setting up department at Metax in Piacenza, the pumping unit and transmission cases are subjected to a stress relieving heat treatment before carrying out the mechanical machining, in order to avoid residual stresses in the structure. Before being assembled, all parts are carefully checked by the technical staff responsible for internal line testing, in order to assure precise matching with the project specifications. After the assembly, all the pumps are subject to final testing to verify the functionality of each part.

The diffusion of the Metax equipment has really no boundaries and the success of the batching, and pumping modules of cement mixtures designed and manufactured in the factory in Piacenza, has also reached Australia, where the supply of equipment has involved the joint venture Transcity - which the Italian group Ghella Spa is member of - engaged in the construction of two parallel road tunnels of about 43 km (26.70 miles), which have joined the northern (Bowen Hills) and western (Toowong) parts of the city of Brisbane.

The conclusion of the works was planned for 2014, but thanks to the technology provided by Metax, the works were completed well in advance, last July. The diffusion and the diversification of use, particularly of the triplex pumps



Another motor pump MP7 in the construction site of the underground station of Sham Shui Po District, the dense underground network in Hong Kong

types MP4, MP5, MP7 and MP9 - with innumerable and different specific engines - has established itself worldwide and reached countries like Siberia, India, Singapore (only on this island there are more than 25 Metax pumps for various ongoing projects), but also South Africa, Vietnam and Australia, where the technology provided by Metax mainly contributed to the creation of new and innovative projects for large infrastruc-

tures. In the meantime, Metax has never stopped expanding worldwide, and its machines are waiting to be moved to other international destinations from the headquarters in Piacenza. On the "planet of the construction sites" the splashdowns of made-in-Italy engineering are not yet concluded. Thus, the vanguard of the old Europe puts pressure on the industry's future and on good ideas. Returning to win. ■