



**SOMETHING FOR
*EVERYONE***

Mapelli Giuseppe, Bedeschi SpA, outlines the different types of conveyors proven to suit the needs of a range of cement plants and manufacturers.



According to recent trends, at a global level, the cement industry is steadily expanding year by year. The rise in urbanisation, infrastructure and the development of construction activities are contributing to a significant increase in the volumes of cement consumption. Indeed, in 2021, global cement consumption is expected to reach 4.42 billion t, an increase of 8.33% compared to 2019. This will lead governments and cement manufacturers to increase their

productivity, investments and construction activities. Lately, the largest cement markets continue to be concentrated in China, where the construction sector grows at a very fast pace, but also in India, Indonesia, the Middle East and Africa. In Africa, in particular, the highest consumption rates are recorded in Algeria and Egypt which, despite the low level of development compared to Western countries, have been experiencing considerable levels of growth over recent years.

Table 1. Specifications for the overland conveyor for the Lafarge Holcim Maroc project.

Material	Limestone
Conveyor capacity Q	1250 tph
Belt width B	1000 mm
Pulley centre/centre distance L	4350 m
Loading/unloading point drift or drop	- 200 m
Total installed power	500 kW
Rubber belt	Steel cord
Radius of horizontal curve	2000 m

Table 2. Specifications for equipment being installed in the KHD Lehigh Mitchell project.

Material	Cement
Conveyor capacity Q	420 tph
Pipe diameter	300 mm
Pulley centre/centre distance L	660 m
Loading/unloading point drift or drop	0
Total installed power	132 kW
Rubber belt	Textile insert
Radius of horizontal curve	400 m



Conveyor for Lafarge Holcim, Souss.

In order to maintain the cement sector's growth, it is very important for these leading countries and cement producers in general, to choose eco-friendly equipment and modern technologies that are able to support their projects and activities and ensure the highest environmental standards.

With more than 110 years of experience and with a wide portfolio of products and solutions, Bedeschi is a reliable partner for cement companies looking for state-of-the-art solutions for crushing, handling and storage of raw materials and final products. The company has proven experience with all kind of raw materials and additives, and provides the designs, engineering and manufacturing of integrated solutions covering cement company needs from quarry extraction to mill feeding, in addition to import and export solutions for handling clinker and cement (on-shore and off-shore). The case studies discussed in this article illustrate the different types of conveyors used in the cement industry. Bedeschi has expertise in traditional overland conveyors, pipe conveyors (a preferable type of eco-friendly solution), garland and SDTI conveyors.

Recently, the Italian company has been involved in the realisation of a major turnkey project for one of the most important companies in the cement industry – Lafarge Holcim Maroc. The project involved the engineering, procurement and construction of a 4.4 km long belt conveyor with a transportation rate of 1250 tph to transfer crushed limestone from the quarry to the cement plant. The total installed power is 500 kW.

The company was challenged with the task of installing the conveyor in an extremely difficult location. Indeed, from a morphological point of view, the area is almost inaccessible (Souss, Agadir), characterised by mountains and slopes. The company's engineers had to conduct several topographical surveys, identifying all the possible obstacles during the construction of the conveyor. The quarry is positioned on the mountain, 470 m above and approximately 4.4 km away from the plant. The belt conveyor is the sole feeding line for the whole plant with a strategic impact on its reliability. The 4.4 km conveyor has been subdivided into 259 trusses spanning 18 and 15 m, 21 standard access towers and a special truss girder of 30 m, designed to cross a gorge. In order to guarantee high standards of quality and safety, smart solutions were chosen for the engineering and construction phases. It was important both for Bedeschi and the client to adapt as much as possible to the area's natural conditions by using, for example, suspended cableways for the erection of the trusses, fully preassembled on ground.

Table 3. Specifications for Lhoist Germany's traditional overland conveyor for limestone.

Material	Limestone
Conveyor capacity Q	900 tph
Belt width B	1000 mm
Pulley centre/centre distance L	585/197/318/184 m
Loading/unloading point drift or drop	+72/+10/0/-21m
Total installed power	475 kW
Rubber belt	Textile inserts
Radius of horizontal curve	500 m

Table 4. Specifications for the pipe conveyor for Batisöke Söke Cimento Sanayii T.A.S. in Izmir, Turkey.

Material	Crushed limestone
Conveyor capacity Q	1200 tph
Conveyor length	1180 m (approx.)
Conveyor lift (drop)	-135 m (approx.)
Pipe diameter	400 mm
Belt width	1600 mm
Belt speed	3.15 m/s
Total installed power	400 kW
Rubber belt	Steel cord
Radius of horizontal curve	400 m

Consequently, the combination of Tekla Structures and Trimble Connect technologies was fundamental for improving the quality and design of the conveyor. Tekla Structures is a Building Information Modelling (BIM) software package which permits the creation, combination, management and sharing of multi-media 3D models. Trimble Connect is a collaboration tool that connects the right people to the right constructible data, at the right time. The whole conveyor in the mountainous area was completed in two months. The usage of the cableway led to the full satisfaction of the client for the high standards of safety.

The specifications of the equipment used for the Lafarge Holcim project (a traditional overland conveyor) can be seen in Table 1.

In 2019, Bedeschi was awarded another important contract with KHD Lehigh Mitchell for conveying cement. The contract includes the supply of two complete crushing units composed of an apron feeder and a double roller crusher, and one blending, stacking and reclaiming longitudinal system for limestone, a clay apron conveyor and an eco-friendly pipe conveyor for cement (700 m long). The system capacity is 420 tph and the total power is 132 kW (Table 2).

Moreover, in the same year, for Lhoist Germany, Bedeschi signed a contract for the supply of a traditional overland conveyor for limestone with a capacity of 900 tph (Table 3). The conveyors supplied for these projects are characterised by their horizontal curve that reduces installation and maintenance costs.

In the context of traditional conveyors, one of the company's primary objectives is the



Pipe conveyor for Batisöke Cimento, Turkey.

prevention of pollution. In order to protect the environment, the company focuses on the realisation of eco-friendly equipment. A great example is the pipe conveyor installed for the client Batisöke Söke Cimento Sanayii T.A.S. in Izmir, Turkey, in 2016 (Table 5). In this installation, the conveyor is characterised by its approximately 90° curve. The conveyor is also a lowering conveyor with a regenerative VFD, which uses power generated from the conveyor to feed the crushing house at the quarry. The equipment for crushed limestone has a capacity of 1200 tph and power of 400 kW.

For several cement plants in Italy, Turkey and Israel, Bedeschi also supplied belt conveyors with the Vackem system. In particular, in Israel for the client Lesico, the company supplied a belt conveyor to transport grain from jetty to silo. The advantage of the Vackem system is that it increases the belt capacity and is self-centring because of its deep trough. The set-up tensioning system for convergence angle allows the user to modify the convergence by separate sections, acting only on the fix point. The convergence varies automatically depending on the belt's load, providing stability as a result. Moreover, the deep semi-circular shape of the belt contributes to the stability of transported bulk material on the

belt itself. The VACKEM system allows for the manufacture of high inclination belt conveyors, using flat standard belting instead of flexible sidewall ones. This leads to a considerable cost reduction, in belt supply and in maintenance and belt clearing. By increasing the carrying idlers' pitch, there is a reduction of installed rolling components. Therefore, there is less chance of a failure and there is a reduction in operating and maintenance costs, while increasing safety. The particular shape of the trough allows for a greater cohesion and stability of carrying bulk material. Consequently, there is a reduction in dust from the bulk material movement and the bulk material spillage is reduced.

Conveyors are one of the best solutions for handling bulk materials. Thanks to its long-term experience in the cement industry and the quality of its tailor-made equipment, Bedeschi brings satisfaction to its customers. ■

About the author

Mapelli Giuseppe is Bedeschi's Sales Director for Europe and the North Africa region with more than 25 years of experience in bulk handling systems. Dr. Mapelli is also Bedeschi Group's expert in the belt and pipe conveyors sector.