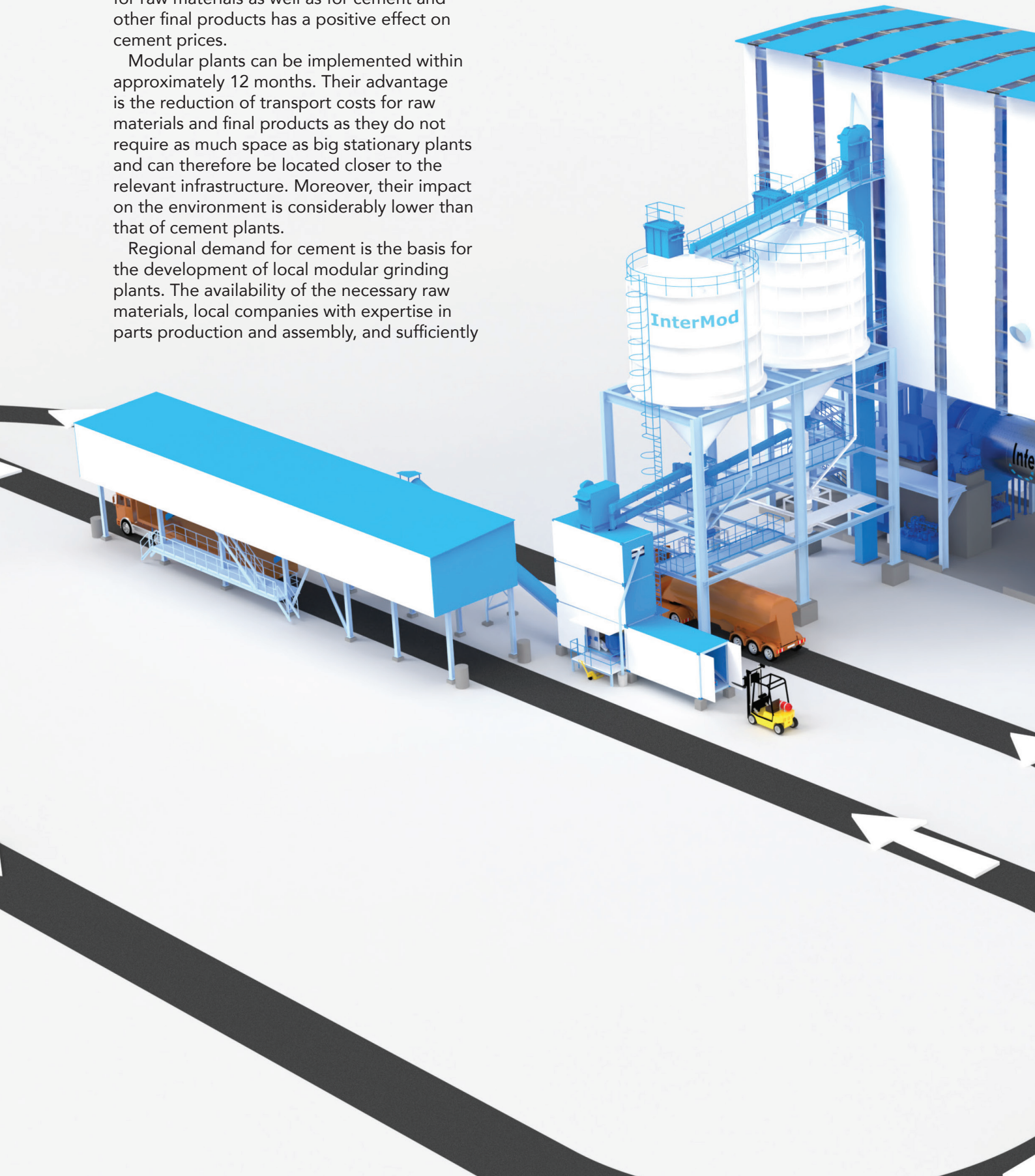


In industrialised countries, large cement production units are dominant. However, many regions in the world do not have easy access to construction materials and for this reason, prices tend to be very high. Therefore, smaller grinding units are becoming a more attractive option, especially from a logistical point of view. The reduction of transport costs for raw materials as well as for cement and other final products has a positive effect on cement prices.

Modular plants can be implemented within approximately 12 months. Their advantage is the reduction of transport costs for raw materials and final products as they do not require as much space as big stationary plants and can therefore be located closer to the relevant infrastructure. Moreover, their impact on the environment is considerably lower than that of cement plants.

Regional demand for cement is the basis for the development of local modular grinding plants. The availability of the necessary raw materials, local companies with expertise in parts production and assembly, and sufficiently

**Olaf Michelswirth,
Intercem Engineering, explores
the advantages of modular
grinding plants over larger
cement production units.**



Small scale,

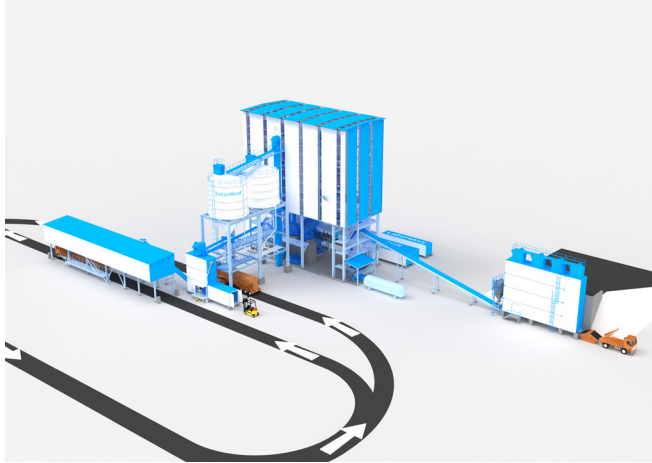
big

impact

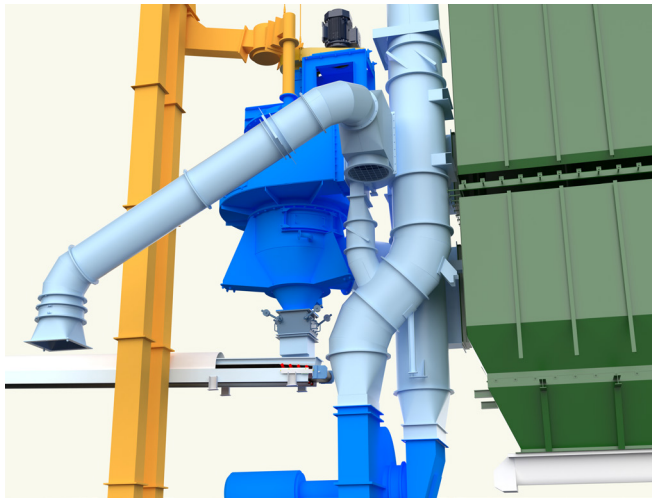


trained personnel are secondary preconditions. Furthermore, reliable energy supply and transport routes are essential. Potential investors will also consider the political context and stability as an incentive to start activities.

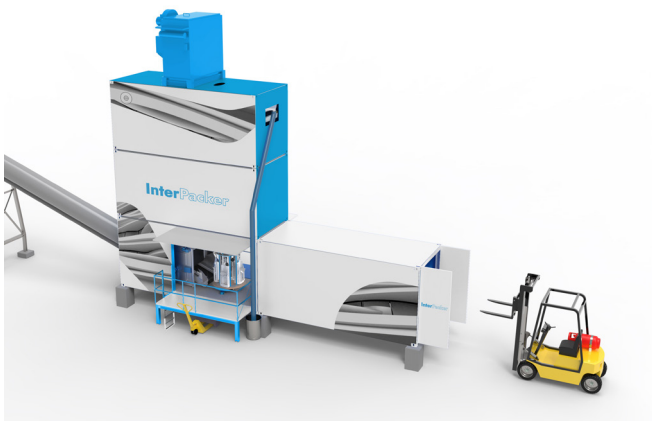
Intercem has developed a modular grinding system with production capacities between 20 – 50 tph, called InterMod. This is a complete grinding station, supplied mainly in a 40 in. container size.



Master layout of an InterMod Gold.



Sample of an InterSep.



An InterPacker in a container.

Within 6 – 8 weeks, it can be mounted and commissioned on site, using only tried and tested aggregates. This contributes to the economic efficiency of the plant and its high availability. Moreover, handling and service are easy.

In the same short period of time the modular plants can be disassembled and stored or rebuilt in another location. This enables operators to respond flexibly to economic, cultural, political or environmental changes.

The three main modules

Separation

In terms of separation, the inhouse-development InterSep ICS – a high efficiency separator with tangentially-fed airflow – is recommended.

Grinding

In terms of grinding, vertical roller mills (VRM) can be used as an alternative to ball mills for modular cement grinding plants. VRMs allow higher capacities than ball mills, depending on their size. New ball mills are of course the other recommended option and can also be installed in semi-modular systems. The possibility to also integrate used and refurbished second hand ball mills is a further opportunity to save costs and to act in a sustainable way.

Packing

Another new development is the InterPacker, a packing module developed by Intercem.

The four-spout InterPacker is a further development of the highly available RotoPacker, which has been in operation for many years.

A compact design is achieved by a central drive. This allows installation in a 20 in. container, which is a new feat. In addition, the capacity can be doubled by installing four additional bag filling spouts in a modular design. The basic rotor body of the standard version allows this modification. The use of a simple row packer in a container is therefore no longer state-of-the-art.

An InterPacker offers:

- ▶ Compact design.
- ▶ Central drive.
- ▶ Reduced electrical energy requirements.
- ▶ Fewer wear parts.
- ▶ Basic rotor body designed to accommodate four additional stack filling spouts.
- ▶ Reliable design.

- ▶ High availability.
- ▶ Robust construction.
- ▶ Made by InterceM in Germany.
- ▶ User-friendly operation: Easy to operate, with intuitive controls, meaning that less training is required.
- ▶ Quick changeover: Quick changeover between different bag sizes which increases flexibility and productivity.
- ▶ Environmentally friendly: A lower energy consumption and an optimised design result in a smaller environmental impact.

In a modular grinding plant, high quality cement can be produced exactly where it is needed, in sufficient quantities. Traders can produce their own cement and react flexibly to customers' needs, becoming independent from suppliers and adapting to changing local circumstances.

This underlines that modular grinding plants are the ideal product for cement traders and/or investors from outside the industry into the manufacturing of cements and binding agents.

Advantages of modular grinding plants at a glance:

- ▶ Flexible, built-up in modules.
- ▶ Fast delivery.
- ▶ Pre-assembled/quick installation.
- ▶ Compact design.
- ▶ Minor civil works.
- ▶ Removable.
- ▶ Low investment cost.
- ▶ Small plot size.
- ▶ Latest technology.

The modules for the InterceM modular grinding system InterMod are pre-assembled as much as possible at the InterceM site in Oelde, Germany. The steel cement silos are supplied as steel silos in containers and erected in parallel to the installation of the modules and the ball mill.

This results in:

- ▶ A short erection time of about 6 – 8 weeks due to the modular, pre-installed construction design.
- ▶ Existing parts of the plant can be easily integrated.
- ▶ Proven technology with high availability.
- ▶ Very short commissioning period and high operational safety, as it is preassembled in Germany by qualified and skilled workers.
- ▶ Highest quality standards: 'Made in Germany/EU'.
- ▶ It is easy to change the site of the single modules and the ball mill later.
- ▶ It is possible to complete this project in approx. 12 months.

Regional modular grinding plants

In European countries, the idea of modular grinding plants has taken root. They can be built in areas where large cement plants would never be possible, because they only need



A four-spout Interpacker.



A masterlayout of the grinding module.



A ball mill.

small land areas. Thus they can be situated strategically near the centres of consumption. Being modular and completely above ground, civil engineering is simplified considerably.

As part of its first modular project, a company in France chose Intercem as the contract partner for the cement grinding module. This was engineered, delivered, assembled and commissioned by Intercem experts.

The plant consists of a ball mill Ø 3.2 m by 10.0 m EGL with a nominal design capacity of 30 tph and latest generation vertical air separator IVS 62 to ensure high efficiency particle separation. Intercem supplied a closed circuit two-compartment ball mill with a vertical high efficiency air separator. The first compartment is equipped with lifting liners to assure powerful impact for coarse grinding. The second compartment is equipped with a three-step classifying liner system to assure ball sorting with high fine grinding action. The intermediate diaphragm allows material flow adjustment to optimise material level in both compartments. Intermediate and outlet diaphragm assure maximum air ventilation.

- ▶ Installed mill power: 1.300 kW side drive, separator type: Intercem vertical high efficiency separator IVS62.
- ▶ Product collection: Direct separation by air jet filter (70.000 m³/h).

- ▶ Dust content within clean gas < 10 mg/m³.

The maximum allowable noise emission of 82 dB/A around the building was a technical challenge, but was solved with special cladding, consisting of perforated substructure, rockwool and the trapezoidal outside cladding. With these measures, noise levels of less than 82 dB/A were achieved.

Conclusion

The advantage of modular grinding plants is that different elements can be used to offer tailor-made solutions for each individual client, adapted precisely to their requirements. A modular grinding system, such as InterMod, well suited for investors and cement traders who want to take their first steps into the cement sector and enter markets of up to 350 000 tpy. ■

About the author

Olaf Michelswirth studied mechanical engineering in Paderborn and obtained a degree as a Graduate Engineer. After years of experience in the cement industry, he became General Manager of Intercem Engineering in 2005, applying his expertise in many projects all over the world, at the moment particularly in Africa.