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New standards in mold making: Recycling technology reduces carbon footprint in concrete block production

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In the concrete block industry, the issue of sustainability is increasingly taking centre stage. Manufacturers of paving stones, bricks and garden and landscape elements are facing the challenge of reducing their carbon footprint worldwide - in particular by using lower-emission materials. As cement is the main component of concrete products and makes a significant contribution to the carbon footprint, there is an intensive search for more climate-friendly alternatives that enable sustainable production.

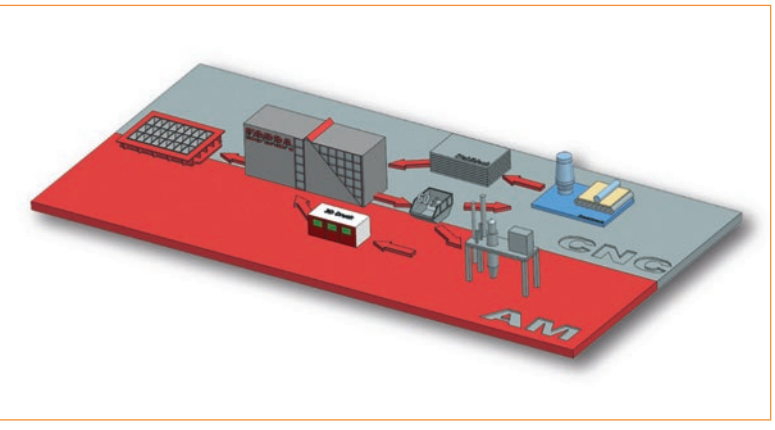
Keeping the carbon footprint as low as possible is no longer just an image factor: In public tenders, it can be a decisive criterion for awarding the contract – even if in practice the most favourable bidder is often awarded the contract. Nevertheless, there is growing pressure to reduce climate-damaging emissions along the entire value chain. Accordingly, there is great interest in innovations that help to measurably improve the carbon footprint without complex changes to the company's own processes.

While the classic circular economy is already established in sectors such as paper, glass and plastics, the steel sector has long been considered inflexible: Scrap metal was fed back into the conventional production process – but often only as low-priced scrap, with no guarantee of reuse in equivalent quality. Kobra goes a decisive step further: Targeted sorting and material processing of the company's own steel remnants produces a mono-material with precisely defined properties – ideal for high-precision mold making.

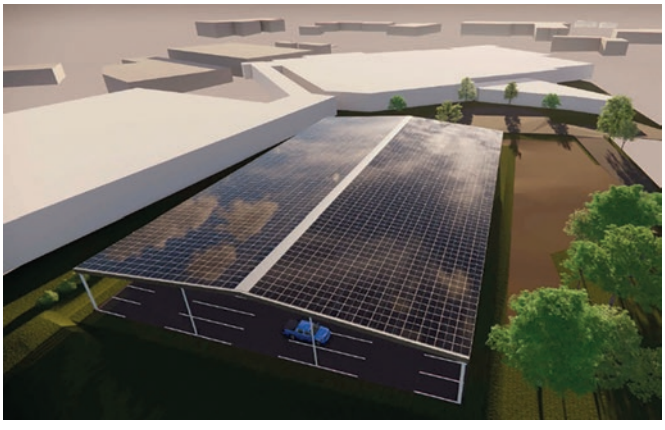
Mold making with technical challenges

The path to CO_2 reduction was also associated with technical challenges in mold making. In the past, complete molds were often made from different steels – a construction method that was widespread, mainly for cost reasons. However, these constructions had significant disadvantages in terms of stability and durability: Cracks could occur at the welded joints. In addition, the heat input during welding significantly impaired the hardness quality in the outer stone fields – with negative effects on the service life of the tool.

Kobra set a new standard back in the early 2000s with the development of Moduline technology: Mold bottoms were manufactured from the block, only the flanges were added - preferably using screw connections. If these could not be realised for technical reasons, the outer areas of the Moduline inserts were designed in such a way that a heat-dissipating



Material and process diagram with recycling in the circular economy at Kobra



Kobra has a total PV capacity of 1.3 MWp

Machining-free tamper shoes

structure of empty fields prevented heat input during welding. As a result, the hardening layer in the stone areas that are crucial for the service life remained completely intact. This design innovation played a key role in significantly extending the service life of the molds – and, from today's perspective, laid the technological foundation for the recycling solution that has now been implemented.

The decisive step was to design internal processes in such a way that exactly those steel qualities are recovered that fulfil the high requirements for microstructure, composition and hardness behaviour. In close cooperation with mechanical engineering partners, Kobra has implemented new systems and processes over the past five years that not only sort and process, but also produce new mold elements - electrically, efficiently and without any loss of quality.

While large steel companies around the world are working on scaling up "blue" and, in future, "green" steel, Kobra has achieved a decisive lead with its own solution: The internally recycled steel will be used on an industrial scale as early as 2025 – exclusively for the company's own needs. The energy for processing comes entirely from renewable sources and is generated directly on site. In this way, Kobra not only fulfils its own environmental goals, but also supports its customers in reducing the carbon footprint of their products – without having to change processes or production lines.

Optimised process for in-house recycled steel

Another advantage of the new concept: The processes for processing the steel recycled in-house have been optimised

to produce significantly less waste than before. Precise use of materials, exact machining and digital process control ensure a new level of efficiency in mold making. The molded parts are characterised by maximum fitting accuracy, consistent hardness properties and overall resource-saving production. This once again emphasises Kobra's role as a technological pioneer and sustainable driving force in the industry.

The reactions at bauma 2025 speak for themselves: Customers from all over the world are enthusiastic about the new recycling technology - not least because it makes a real contribution to achieving their own climate targets. The ability to reduce CO_2 directly via the mold tool used gives manufacturers new leverage - without additional investment in their own processes or materials.

Kobra is sending out a strong signal: Sustainability, resource conservation and technological excellence are not a contradiction, but the path to a future-proof concrete block industry. This innovation brings the vision of one day being able to recycle 100% of old molds within reach – and once again sets the standard for the future of mold making. ■

FURTHER INFORMATION

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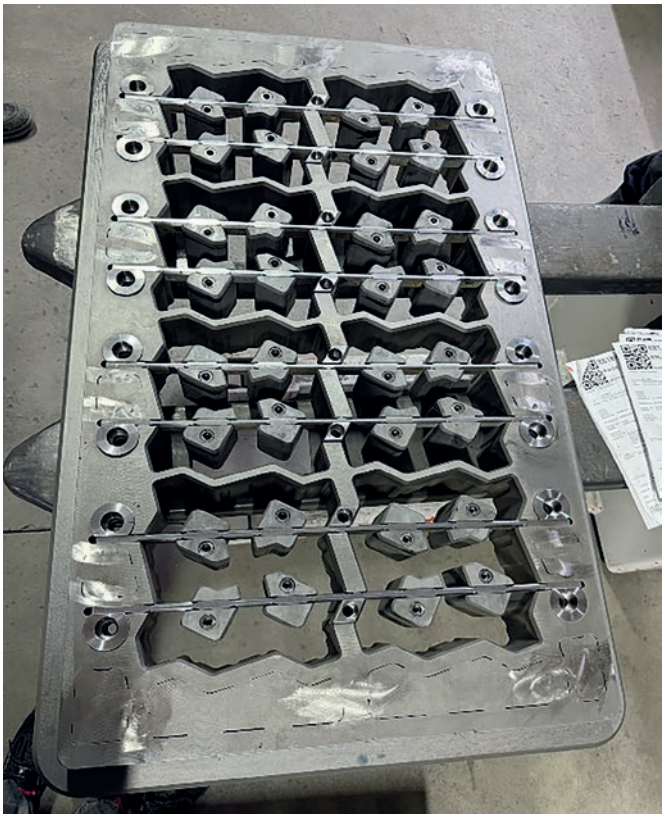

Mold for grass pavers with cores made from recycled material

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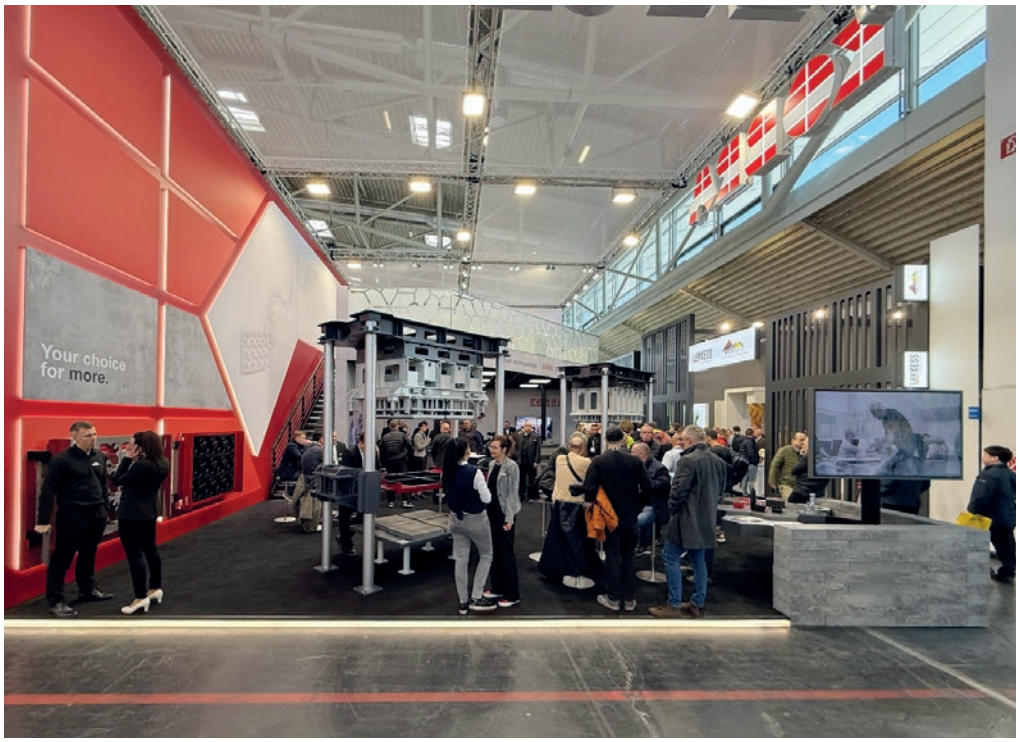

Presentation of the new technology at the Kobra stand at bauma 2025.