

Kobra Formen GmbH, 08485 Lengsfeld, Germany

Practice-oriented service for concrete plants

Professionally executed repairs to concrete block moulds minimise wear and damage-related production downtimes, save transport costs and don't tie up the user's own personnel. Based on nearly 25 years of experience in the manufacture of moulds for the concrete block industry, repairs are carried out through expert personnel and well-thought-out services that support the economic production process.

■ Holger Stichel | Kati Woityczka,
Kobra Formen GmbH, Germany ■

Customer-oriented service starts with the development of new technologies

Concrete block manufacturers produce their products in an industrial process with a multi-functional plant in which the concrete block mould can be regarded as the multiplier and precision tool. With good handling and care the service life can be prolonged and the costs per cycle reduced. Tools are subject to wear – the main cause of most repairs is the wear of those parts of the mould that come directly into contact with concrete during the production process. Various factors are responsible for the wearing of the mould tool: the product to be manufactured and its requirements play just as big a part as the material and the mixture, the machine's environment and settings and, as already mentioned above, the care and handling of the mould. In order to counteract wear, Kobra developed the carbo™ hardening process which, for example, considerably improves the resistance to wear of paver moulds or wearing parts of the Boltline™ product group, which includes hollow block or kerbstone moulds amongst others. The service life of

gas-nitrided hollow block moulds before the introduction of the carbo process over 15 years ago was around 100,000 cycles. That can easily be doubled today due to the improved product quality. In 2014 Kobra delivered the first moulds whose cover plates and liners were manufactured in carbo 68 plus™ quality. These similarly exhibit significantly higher numbers of cycles, thus making the early exchange of wearing parts unnecessary. The service life of nitride hardened hollow block moulds can easily be doubled today due to the improved carbo™ material and hardening quality.

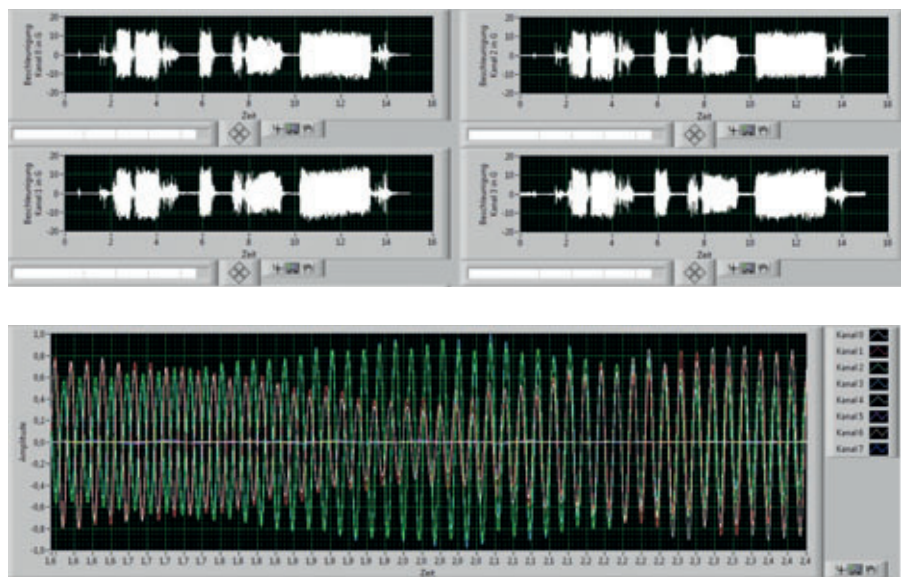
Added value for the customer - Kobra Campus™

In keeping with the corporate philosophy of "permanently gaining the trust of every customer through performance and by sharing ideas with one another", Kobra organises trade conferences with internal and external specialists from the industry, invites associations and the relevant trade press to company inspections or holds topically-related customer events. Kobra is a meeting place for the innovative. The industry leader thus regularly extends invitations for a mutual exchange of ideas in all subjects con-

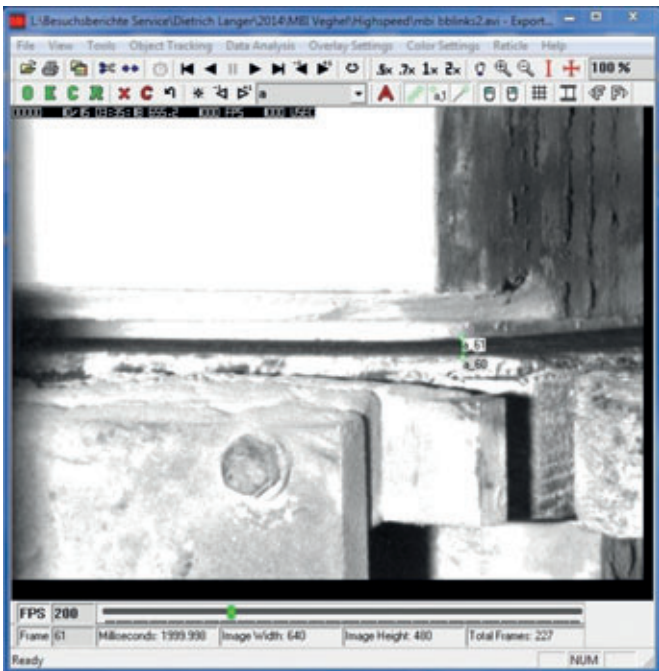
nected with mould construction. The concept becomes tangible at the annual trade conferences. There is plenty of room for creative encounters, whether in the in-house production and event rooms or directly at the customer's premises.

Dedicated specialists pass on their expert knowledge. For the Service department, that means in detail the following main topics: Dynamic View™, high-speed recording and StartUp service.

Dynamic View features detailed and extensive advice on the adjustment of the necessary machine setup in order to avoid high wear of the mould. Kobra has a special measuring system for this, with which acceleration and frequency spectra can be visualised with the aid of software. Process and machine settings can be optimised in order to ensure the manufacture of high-quality products. The dynamic behaviour of the mould and the vibrating table in the machine during the compaction process is measured by up to 8 accelerometers at the same time and analysed afterwards in every detail. Accelerations, velocities, oscillation paths and frequency spectra are checked and if necessary recalibrated. On request Kobra additionally offers assistance with the procurement of the extensive technology required.



Recording and analysis of the processes during the compaction process with the aid of vibration measurements on up to 8 channels at the same time.



Visualisation of significant details with a high-speed camera. Informative pictures provide indications for corrections to the process and machine settings.

High-speed recordings prove a long-known piece of wisdom: errors in the process show up first in the mould. The cause of previously unexplainable problems can be detected with high-speed recordings. Parameters that are important for the production process but barely perceptible to the human eye can be visualised and analysed in order to be able to make corrections to the process settings on the machine. This visualisation not only benefits the service life of the form, but also helps to lower maintenance and spare part costs for the machine. Like the vibration measurement mentioned above, Kobra also supports customers here if they are interested in purchasing such a high-speed camera.

Under the StartUp brand, Kobra offers professional instruction on the handling of special product-specific equipment in the mould, such as heated tamper shoes (Hotshoe™). Support is also provided



Integral solutions of high technology and precision.

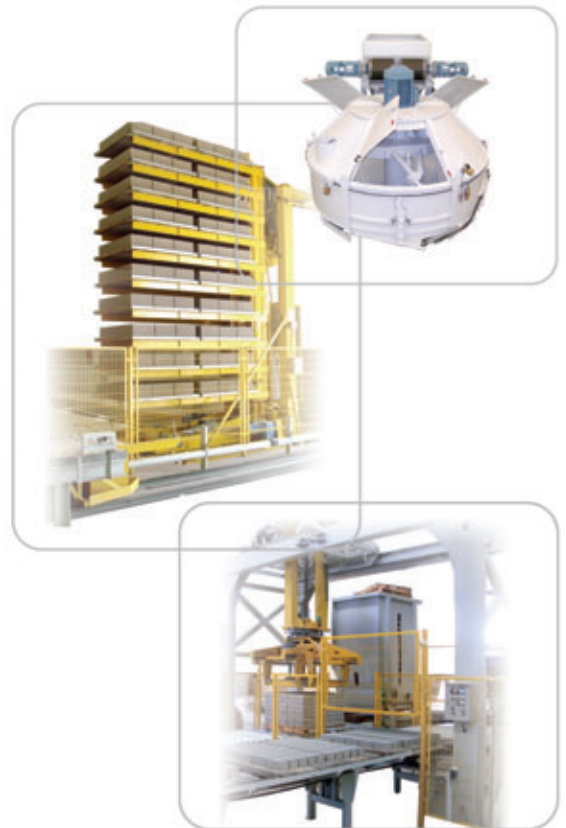


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Typical wear patterns: one-sided chamfer wear

for the commissioning of complex custom and individual moulds, for the use of vibrating liner moulds from the Dynamic™ series or for help with the production introduction of hydraulic moulds, for example moulds with hydraulic filling compensation or push-

ers in the mould walls. The Support on Site™ service from Kobra goes one step further. With their know-how, service technicians ensure the optimum start-up of a new plant and also train employees of concrete block manufacturers how to correctly oper-

ate the mould tool. Therefore nothing stands in the way of a successful start-up of a concrete block production plant.

In-house Repair service

The overhaul of a concrete block mould is always oriented to the optimum cost-benefit ratio. Careful investigation and/or fault diagnosis is followed by a quotation. The customer thus obtains optimum cost transparency and tangible facts for economic decisions: In-house Repair Service – repairs carried out directly at the Service Centre in Lengenfeld.

At the service centre, which is directly connected to the main factory of Kobra Formen GmbH in Lengenfeld, all incoming repair items are cleaned and submitted to a thorough investigation on the basis of wear patterns. This results in a precise definition of all the necessary measures for an economically meaningful repair. All general information and data on the history of a mould manufactured by Kobra can be completely traced and repairs can be carried out in manufacturer quality. The customer receives a detailed quotation for the corresponding service work.

In detail, the Lengenfeld Service Centre offers the following services:

- Reconditioning the lower edge of the mould bottom
- Changing tamper shoes, fitting and assembly included
- Rewelding cracks in frame and tamper head
- Replacement of individual components of the frame, mould insert with complete spare part sets
- Reconditioning swords and shoes
- Face grinding tamper heads and mould bottoms
- Overhauling hydraulic and heated moulds
- Reconditioning rails
- Retrofitting complete moulds to other machine types
- Painting and assembly of each mould

Support on Site – selective measures to extend the service lives of concrete block moulds

Minor damage to the mould can be repaired uncomplicatedly directly in the plant. For concrete block manufacturers this means avoiding long downtimes in production and a saving on transport costs. Through Kobra's Support on Site service, purposeful measures can be taken to prolong the service life of the concrete block moulds:

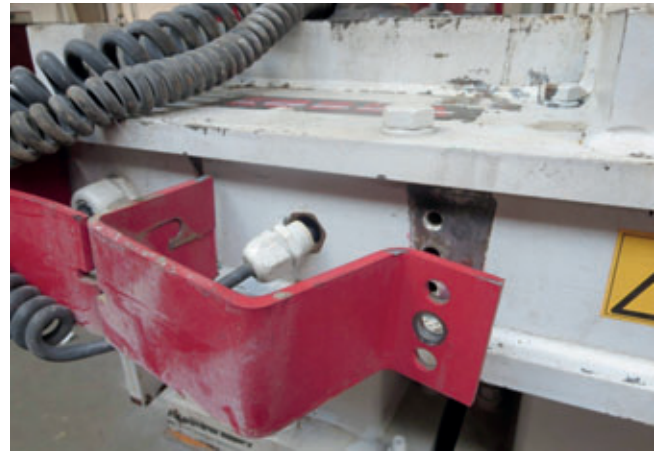


Overstressing/cracks



Wear in the compaction area

- Welding cracks in the insert, frame or tamper head
- Welding or replacement of broken tamper pipes
- Repairing damaged chamfers
- Replacing worn tampershoes or core assemblies
- Reconditioning the lower edge of the mould bottom
- Liner replacement for bolted moulds (vibrating liner mould)
- Start-up service for heated special moulds



Damage due to incorrect handling / maintenance

Table measurement

The machine environment similarly plays a decisive part in the production of high-quality concrete blocks. The freedom of movement of the mould bottom, the condition of the rubber-buffers on the vibrating table, the type and condition of the boards, the feed box guide, the machine frame and the foundations are important factors. For example, unevenly adjusted static bars on the vibrating table result in varying compaction processes and different block qualities. The Kobra Group's service vehicles are equipped with an electronic distance measuring instrument for the measurement and adjustment of the static bars settings on the vibrating table.

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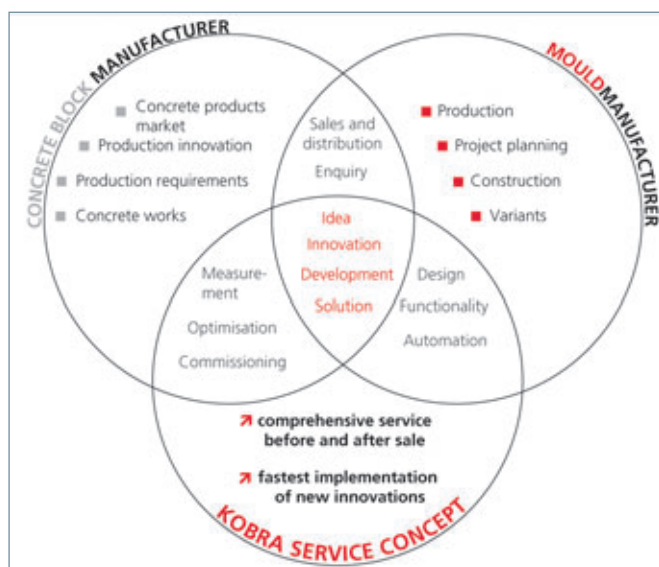


Elephant's feet" at the lower edge of the mould bottom

Development of a modular construction method – for faster and simplified repairs

The simple and fast replacement of wearing parts on the concrete block mould in the interests of a continuous production process enables the customer either to carry out its own repairs or to have the wearing parts replaced on site by a Kobra service engineer. The prerequisites for a securely bolted connection are precisely adjusted torques and exact adherence to technological procedures. Basic knowledge for the professional exchange of tamper shoes or wearing parts is conveyed on special Kobra customer training courses.

The Boltline technology, which enables the uncomplicated and efficient exchange of individual parts, has been continuously advanced by Kobra on the basis of an individual part concept in various product groups. For example, the mould liner of a Boltline 3 mould, which is used for the large-sized products, consists entirely of plug-in/bolted individual parts which are thus replaceable. The bolted covers and the frame construction are likewise individually exchangeable in this product group.



Kobra service concept

Where sustainability is concerned, Kobra even goes one step further here: 1.8 tonnes of CO₂ are emitted in the production of one tonne of steel. With the modular manufacture of individual walls, 70% less steel is required compared to manufacturing from block material. That lowers the CO₂ emissions by about 50% compared to the conventional construction method.

Spare parts retail – economically meaningful alternative to a service visit

The replacement of cores or corebars is possible without welding thanks to Kobra's aforementioned modern modular construction. At least, independent repairs of a higher quality are thus possible on site. With Singlebolt™ it is also possible to carry out simple and fast repairs of single-piece tampers. This feature increases the stability of the tamper head. Improved handling of the mould is ensured, along with higher profitability due to the longer service life of the tamper head. Heating elements on special moulds can also be replaced on site by sufficiently trained personnel.

Valuable notes from the manufacturer on the correct care and storage of precision tools and the early recognition of wear patterns

Through the thorough cleaning, careful maintenance and regular checking of the moulds between the production phases, the repair requirement can be promptly recognised on the basis of wear patterns and the machine settings adjusted. Here are a few valuable hints from the manufacturer with whose observance you as a producer can significantly prolong the manufacturing cycle of your concrete block moulds.

Ensuring the correct mounting of the mould in the machine

When ensuring the correct mounting of the mould in the machine, the correct seating of the mould bottom between the vibrating table and the material storage container plays a large role. The feed box should be able to slide with slight play between the mould and storage container. Contact between the feed box and the mould will damage the mould, while too much play will lead to material losses. Correct adjustment of the tamper head: the tamper shoes must be easy to insert into the liner.

This avoids excessive wear of the mould walls and thus an imperfect product pattern. Attention must be paid to the correct mounting of the mould in the machine so that the mould bottom is clamped evenly at all four corners. In addition, all rubber buffers on the vibrating table should be changed at the same time. Only rubber buffers with a close tolerance from the machine manufacturer are to be used for this. Standard rubbers from wholesalers have excessively large tolerances. In the case of multilayer machines the surface of the vibrating table must be cleaned and if necessary ground flat at regular intervals. Users of static board machines should make sure that flat production boards are used so that the lower edge of the mould bottom lies evenly and flush against the surface. The adjustment and condition of the vibrator bearings should be checked at regular intervals.

Regular cleaning

Filling problems can be avoided through regular cleaning of the shaking grids; cleaning brushes should be exchanged at regular intervals and their height should be adjusted correctly for cleaning the tamper shoes.

Flatness of the ram plate

Mounting the tamper head at an incorrect angle causes uneven compaction and visible product defects. In addition, a worn contact surface of the ram plate can lead to cracks in the tamper head.

Storage

After each production phase the mould should be cleaned with compressed air or a high pressure cleaner and subsequently conserved with form oil. The chamfers of the tamper shoes are preferably to be protected with suitable spacers between the spacers on the tamper head and the mould bottom. The spacers should be large enough that the chamfers of the tamper shoes stand approx. 10 mm above the transport pallet. Suitable storage places are rooms protected against the weather or a roofed-over rack. In the case of heated or hydraulic special moulds, additional care must be taken that the cables for the end position switches are protected against damage and that no wet cleaning takes place.

Preventively, it is good sense to check the mould for the following damage after each manufacturing process: what is the condition of the tamper shoes; do the chamfers show signs of wear? Tamper shoe play in the cavity. Poor positioning of the tamper shoes in the cavities or increasing play becomes visible by way of the formation of a ridge on the block. If the tamper shoes exhibit noticeable notches, a repair should be considered in good time in order to prolong the service life of the mould. Checks should additionally be made to ascertain the con-

dition of the lower edge of the mould bottom and whether the cavities exhibit erosion.

Used moulds can be partially overhauled at Kobra as part of the repair service. This way concrete block manufacturers can save up to 30% in comparison with the purchase of a new mould. If the mould is approaching the end of its service life, a new mould bottom can be ordered to match the existing tamper head.

Since its establishment in 1991, Kobra has oriented all its technological developments to the needs of its customers. Numerous innovations are the result of close co-operation with concrete block manufacturers all over the world. The combination of intelligent technical solutions and expert support – including after-sales – will continue to be an important component of the services provided by Kobra in the future. ■



At the service of customers worldwide – the expert Kobra service team.

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