Twin-Shaft Batch Mixer

DKX
The benchmark in mixing technology

Efficient . Reliable . High Performance

BHS SONTHOFEN
All depends on the right mixing technique!
The BHS mixing technique has a significant and rapid effect
towards producing a high-quality mixture which increases
production efficiency and economic value. The BHS twin-
shaft mixing technology offers numerous comprehensive
advantages.

Always a reliable mixing result
With the well-engineered design and alignment of the
mixing tools, our customers achieve a batch-by-batch
consistent high level of homogeneous mixture at short
mixing cycles.

Robust construction and maintenance-friendly
BHS mixers are robust, durable and designed for longevity.
BHS also includes convenient access for machine
maintenance.

Comprehensive modular system
BHS has a wide range of mixing sizes and configurations.
Our comprehensive modular systems can be custom
designed and manufactured for all our twin-shaft mixers to
include designs to meet your specific requirements.

Mixing tests in the BHS Technical Centre
At its in-house Technical Centre in Sonthofen, BHS offers
its customers the opportunity to conduct mixing tests using
customer-specific materials. We can help you to solve any
mixing process problems and are happy to advise you!

BHS world-wide service
We offer our customers fast and reliable service world-wide
and are pleased to assist your project needs at anytime. We
also stock all mixer components and wear parts for quick
delivery from our parts department, world-wide.

Over 120 years of experience
The first Twin-Shaft Mixer was designed and manufactured
by BHS-Sonthofen, Germany, in 1888 and has been
continuously developed ever since. Our customers profit
from our years of experience and technical knowledge
which is integrated into all BHS products. BHS is the
technical market leader in twin-shaft mixing technology.
Approved thousand of times ...worldwide!

www.bhs-sonthofen.com
The BHS mixing system

State-of-the-Art: Three dimensional mixing

BHS spiral mixing tools

- Mixing tools are arranged to create an interrupted spiral for each mixing shaft
- Two mixing shafts rotating in opposite directions with an overlap area of the mixing tools in the longitudinal centre of the mixer
- Counter shovels are located on the ends of both shafts
- Mixing tools operate at a precise and gentle mixing speed

Operating principle

- Generation of a circular three-dimensional movement of the whole mixture
- Intensive material exchange in the turbulent overlap area of the two mixing circles
- Optimal utilisation of the energy input into intensive relative movements of the mixture
- Inclusion of the whole material volume in the mixing process at any time of the process
Three-Dimensional. Rapid. Homogeneous

Result: Quality and economic efficiency

Consistent high level of homogeneous mixture within rapid mix cycles
- Homogeneous mixture levels of 95% are achievable within 30 seconds
- Batch after batch our mixers produce high level uniform and homogeneous mixtures
- BHS mixing techniques preserve the grain structure of the individual recipe components

High energy efficiency
- High mixture performance is achieved at low speeds
- Reduced energy consumption due to short mixing cycles, effectiveness of mixing tools and efficiency of drive units

Low-wear
- Minimal wear of mixing tools and trough liners achieved from relatively low mixing speed and mixer compact design
- Reduced wear compared to pan or planetary mixers
- All wear parts have been optimized and designed for longevity

Efficient concrete production
- Fast and optimal use of cement and other binders
- Potential for saving of cement and other binders
- Consistent and fast distribution of additives and admixtures throughout the whole mixture volume
- Batch to batch consistency for every mixing cycle
- Minimum batch filling levels of 10% are possible
- Guaranteed future-proof in view of new concrete recipes (SCC, UHPC, etc.)
- Hybrid mixing cycles possible (slow – fast – slow)

Development of homogenized mixture during the actual mixing process

The pictures below illustrate in a realistic simulation the development of the homogeneous mixture during the rapid mixing process. This is exclusive in a BHS twin-shaft batch mixer.
Experience and expertise

**Application-oriented mixer configuration**

With over 120 years of experience in mixing technology BHS has the required expertise to provide the optimal solution for all your specific requirements. Depending on the application we also offer in addition to our standard configurations numerous options to customize your twin-shaft batch mixer.

**Drive performance**

Our twin-shaft batch mixer can be designed with different drive configurations depending on the maximum torque requirements.

**Speed**

Our twin-shaft batch mixer can be equipped with optional speed configurations with pole-changing drive or with a frequency converter.

**Feeding**

The spatial arrangement of the chutes and the order of feeding influence the mixing result and mixing time. BHS has the knowledge and the answer for an optimal feeding process.

### BHS mixing test facility

At BHS manufacturing facilities in Sonthofen (Germany) and in Tianjin (P.R. of China), we operate mixing pilot plant stations. For questions relating to mixing processes we perform flexible and versatile mixing tests for our customers. Machine parameters can be varied to determine optimal settings, and recipe volumes can be precisely measured for accurate mix design testing.

### Our numerous DKX products available

Our comprehensive range of high performance twin-shaft batch mixers provides future-proof solutions for almost all fields of industrial applications. You will benefit from our expertise and the many mixing applications available:

- **DKX**: High performance, suitable for almost all types of applications – for building materials and other sectors. Modern concrete recipes with high levels of additives, for instance SCC or UHPC, can also be reliably produced.
- **DKXS**: Reliable production of ready-mix concrete in all consistencies and with consistent high quality.
- **DKXN**: Optimized solution particularly for the production of high-slump ready-mixed concrete.
- **DKXD**: Specially designed and configured for applications in dam construction, designed for high operating reliability and for robust course aggregates.
- **DKXA**: Specially designed for maximum performance in asphalt production and high temperatures.
- **DKXF**: Production of pourable dry fine particle mixtures, equipped with large discharge doors and special positive seal for residue-drip free discharge.
- **DKXG**: Production of granular dry and wet mixtures, equipped with large discharge doors for residue-free discharge.
- **DKXC**: Production of continuous mixing processes with controllable mixing cycles.

Let our experienced specialists assist you towards sizing the correct mixer for your specific application.
Extensive experience with demanding concrete recipes

Even with increasing diversity of recipes, our many available twin-shaft batch mixers are a long-term solution for the production of homogeneous concrete mixtures. When producing specialty mixtures (fine grain, SCC, UHPC, RCC, colored concrete, fiber additives, light weight, etc) you can rely on our comprehensive experience.

Competent partner for mixing plant manufacturers

We are a reliable, long-time competent supplier for various RMC plant manufactures. We have thousands of BHS mixers in use, worldwide; with numerous types of plants. Our mixers are in operation day after day and year after year, they perform to the complete satisfaction of the end user.

Perfect mobility and flexibility with BHS containerized concrete batching plant
Robust and reliable drive technology designed for performance, operational safety, energy efficiency and longevity.

1 Gear box
The worm gears are specially designed for our twin-shaft batch mixer. They offer high efficiency and ensure long service life – even for extreme loads. The gear boxes are placed on the mixing shaft without a fixed connection to the mixing trough.

2 Electric motor
We exclusively use high-quality motors for our twin-shaft batch mixers. They have been specially designed for the mixing load cycles.

3 V-Belt drive unit
The power transmission is equipped with a reliable V-belt drive system. The V-belts are located on the outer side of the drive unit for easy accessibility for maintenance.

4 Torque support
The adjustable torque support is used for adjusting the gearboxes. In addition, this allows during operation a flexible attachment of the gearboxes to the mixer trough in order to prevent excessive load on the gear teeth. This special feature is an important prerequisite for achieving a long service life of the gearboxes.

5 Synchronous coupling
To achieve synchronization between both mixing shafts a low-maintenance elastic coupling is utilized between the gear box units.

6 Shaft sealing and shaft bearing
The mixer shafts are sealed with reliable axial face seals. The shaft bearings are separated from the shaft sealing, which allows for easy accessibility for maintenance and servicing.

7 Fluid coupling (optional)
The hydrodynamic fluid coupling prevents mechanical as well as electrical load peaks. It is recommended in particular for critical electricity supply conditions.
Spiral mixing tools: Precondition for a homogeneous mixture

6 High-quality hexagonal shaft with high torsional and bending strength
9 Streamlined mixing arms made of special cast iron
10 Arrangement of the mixing arms in a spiral shape
11 Easily adjustable mixing shovels

Suitable mixing tools for all types of mixtures

Universal mixing tools with 60° arm position for the production of ready-mixed concrete, precast concrete, specialty concretes and many other mixtures.

Smooth mixing tools for the production of dry materials, dry mortar or concrete blocks (residue-free emptying). The smooth design of the mixing tools and shafts reduces caking to a minimum even when working with highly adhesive mixtures.

Coarse grain mixing tools with 60° arm position for the production of concrete for dam construction; depending on the mixer size they can be used for aggregates up to 180 mm.

Duplex mixing tools for the production of dry and wet mixtures with a high degree of fine aggregates. Doubling the mixing arms greatly increases the shearing forces in the mixture.

Mixer Wear Liners: Innovative solutions for longevity

Rhombus tiles: Rhomb (diamond) shaped tiles with a material thickness of 19 mm optimized with cast chromium steel is used for the mixing trough lining. These exclusive BHS design increases the service-life by 30% in comparison to other square shaped tiles.

Lateral-wall lining: The lateral walls can be lined with wearing plates or an optimized cast chromium steel.

OPTILONG tiles: For higher levels of wear we offer rhombus shaped tiles with a material thickness of 28 mm. Different material hardness of the specific tiling rows will ensure an even wear across all wear zones. The lifetime can be almost doubled compared to standard tile thickness.
Mixer Discharging: Leading solutions for emptying the mixer

Benefits of the rotary discharging gate
- Massive and robust cast iron design
- Centrally located between both mixer shafts
- Effective sealing using adjustable ledges
- Exact control of material discharge rates
- Reliable operation using pneumatic or hydraulic cylinders

Discharge rotary gate options
- Rotary gate in standard size, suitable for most applications
- Rotary gate in larger design for faster emptying
- Split design of the rotary gate for alternate emptying at two discharge points

Discharge door
- Discharge door for residue-free discharge – in particular for applications in the cement, dry mortar and disposal industries

Lubrication systems: For an optimal and reliable lubrication supply

Impulse controlled central lubrication system
The central lubrication system supplies the four inner mixing trough seals with grease. After the cleaning of the mixer only the lubrication system has to be activated via the control panel with continuously variable grease proportioner. Manual lubrication after mixer cleaning is not necessary.

Fully automatic central lubrication system
Using a PLC-control and a progressive plunger metering devices the lubrication points of the four inner mixing trough seals (optionally also for the other lubrication points of the mixer) are automatically supplied with grease. After the cleaning of the mixer only the grease pump has to be activated via the control system.
Optional machine components

**Moisture measurement and temperature measurement**

For a moisture or a temperature measurement of the mixture our twin-shaft batch mixer can be equipped with probes from all notable manufacturers. Owing to its design as well as to the intense, three-dimensional mixing effect, the twin-shaft batch mixer provides highly reliable measuring results.

**Sampling**

Our twin-shaft batch mixers can be equipped with a device for taking mixture samples. This is a significant advantage especially when it comes to producing sophisticated concrete mix designs.

**Electrical terminal box**

Electrical cables can be centrally terminated into a factory supplied junction box for easy installation.

**Maintenance stairs or maintenance mobile platform**

For easy accessibility for cleaning and maintenance, the twin-shaft batch mixers can be supplied with maintenance stairs or mobile platforms.
Mixer cover

The dustproof mixer cover for our twin-shaft batch mixer is equipped with oversized access doors with industrial gas shocks for easy and safe access. Additionally a number of connection options for charging, dust extraction, video monitoring and adding colour or fibres are available. Reliable dust removal can be effected by using airbags or an active filter.

Water feeding

Depending on the application, the water can be introduced into the mixer on a baffle plate or a water spray pipe manifold (gravity or pressurized). The water manifold system with nozzles can be utilized with pressurized fresh or recycled water. For the production of heated concrete we offer reliable steam injection systems.

High pressure cleaning

Our approved high pressure cleaning system has been designed with three-dimensionally rotating nozzle heads. It is characterized by excellent cleaning results and reduced water consumption. For cleaning the discharge hopper an additional circular pipeline system can be added to the high pressure cleaning system. For batching plants, equipped with two mixers, only one pressure unit is required for a two-way cleaning of both mixers.
Plant components and mixer versions

Skip hoist
For fast and clean charging of the mixer with aggregates, we offer custom-made, robust skip hoists as tilting bucket or bottom emptying units.

Discharge hopper
For emptying the mixture into the truck mixer or open truck, we offer approved standard solutions as well as customized options.
Picture: Discharge hopper in rubber basket version with hydraulic swivelling drip protection, additional hopper for dump truck loading, cleaning circular pipeline system, weight monitoring and inspection frame with telescopic supports.

Laboratory mixer
For your concrete laboratory we provide our twin-shaft batch mixer in a version with roughly 60 liter compacted concrete output/batch. The complete mixer has been reduced in size to scale for meaningful test results.

Combinix
With our patented Combinix system the BHS twin-shaft batch mixer becomes a continuously operating mixer with proven twin-shaft technology and controllable mixing time. Output improvements up to 60% are possible in comparison to batch operations.

Vacuum mixer
Our twin-shaft batch mixer can be equipped so that a vacuum can be created during the mixing process. This makes it possible to achieve particularly low air pore contents in the mixture.
### Performance data (standard configurations)

| Type | Dry charge, aggregates and binder | Compacted concrete per batch | Compacted concrete output | Drive system (ready-mixed concrete) | Maximum agg
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<td>Ready-mixed concrete</td>
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<tr>
<td>DKX 0.50</td>
<td>0.75 m³</td>
<td>0.50 m³</td>
<td>73 cycles/h</td>
<td>37 m³/h</td>
<td>73 cycles/h</td>
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<tr>
<td>DKX 0.75</td>
<td>1.13 m³</td>
<td>0.75 m³</td>
<td>65 cycles/h</td>
<td>49 m³/h</td>
<td>65 cycles/h</td>
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<tr>
<td>DKX 1.00</td>
<td>1.50 m³</td>
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<td>58 cycles/h</td>
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<td>1.88 m³</td>
<td>1.25 m³</td>
<td>53 cycles/h</td>
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<td>48 cycles/h</td>
<td>80 m³/h</td>
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<td>2.00 m³</td>
<td>49 cycles/h</td>
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<td>3.38 m³</td>
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<td>46 cycles/h</td>
<td>104 m³/h</td>
<td>50 cycles/h</td>
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<td>3.75 m³</td>
<td>2.50 m³</td>
<td>48 cycles/h</td>
<td>120 m³/h</td>
<td>56 cycles/h</td>
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<tr>
<td>DKX 2.75</td>
<td>4.13 m³</td>
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<td>46 cycles/h</td>
<td>127 m³/h</td>
<td>55 cycles/h</td>
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<tr>
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<td>4.50 m³</td>
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<td>44 cycles/h</td>
<td>132 m³/h</td>
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<tr>
<td>DKX 3.50</td>
<td>5.25 m³</td>
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<td>42 cycles/h</td>
<td>147 m³/h</td>
<td>52 cycles/h</td>
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<td>4.00 m³</td>
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<td>156 m³/h</td>
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<tr>
<td>DKX 4.50</td>
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<td>37 cycles/h</td>
<td>167 m³/h</td>
<td>51 cycles/h</td>
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<td>9.00 m³</td>
<td>24 cycles/h</td>
<td>216 m³/h</td>
<td>43 cycles/h</td>
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</table>

1) 30 sec. mixing time, truck mixer input rate of 0.12 m³/s and compactability rate of 1.15
2) 30 sec. mixing time, compactability rate of 1.45
3) Drive systems for other applications are possible, please ask us
4) Declaration of weight for standard versions without accessories

Performance data for other mixing applications available on request.

Technical data may change due to technical progress. Subject to modification without notice.
### Dimensions and weights (standard configurations)

<table>
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<tr>
<th>Aggregate sizes</th>
<th>A</th>
<th>B</th>
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<th>D</th>
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BHS Product Range:

Mixing Technology
• Twin-Shaft Batch Mixer
• Twin-Shaft Continuous Mixer
• Single-Shaft Continuous Mixer
• Containerized Mixing Plants
• Stationary Mixing Plants
• Plant Modifications & Retrofit

Crushing Technology
• VSI Rotor Impact Mill
• VSI Rotor Centrifugal Crusher
• Impact Crusher & Impact Mills
• Mineral Processing Plants

Recycling Technology
• Rotor Impact Mill
• Rotorshredder
• Recycling Plants

Filtration Technology
• Rotary Pressure Filter
• Belt Filter
• Autopress
• Candle Filter
• Pressure Plate Filter
• Laboratory & Pilot Filter
• Filtration Plants

BHS world-wide service
• Tests in our BHS Technical Centre
• Process Engineering & Consulting
• Spare Parts & After Sales Service