



Asphalt mixing plants

TYPE ECO



IT'S ALL IN THE MIX.

Leading asphalt mixing plant technology.

State of the Art! BENNINGHOVEN has been following this approach for over a century. Through consistent further development, growing from a trade workshop to a globally active company, BENNINGHOVEN is now a pacesetter in the field of asphalt mixing plants. Based in Wittlich, Germany, we produce ultramodern and flexible asphalt mixing plants and Retrofit components. The company develops solutions that combine technical performance with the efficient use of resources and energy to manufacture products ranging from conventional rolled asphalt to asphalts with a high proportion of RAP as well as reduced-temperature asphalts. Thanks to decades of experience in plant design and engineering, we offer customers throughout the world support for producing high-quality asphalt for durable and reliable road surfacing.

BENNINGHOVEN is a branch of Wirtgen Mineral Technologies GmbH and a member of the ever-expanding, global Wirtgen Group, which is in turn a key part of John Deere.

BENNINGHOVEN PRODUCT RANGE

- CORE**
Asphalt mixing plant
"The rising star"
- ECO**
Asphalt mixing plant
"The multi-talent"
- TBA**
Asphalt mixing plant
"The specialist"
- RPP**
Recycling plant
"The RAP expert"
- RETROFIT SOLUTIONS**

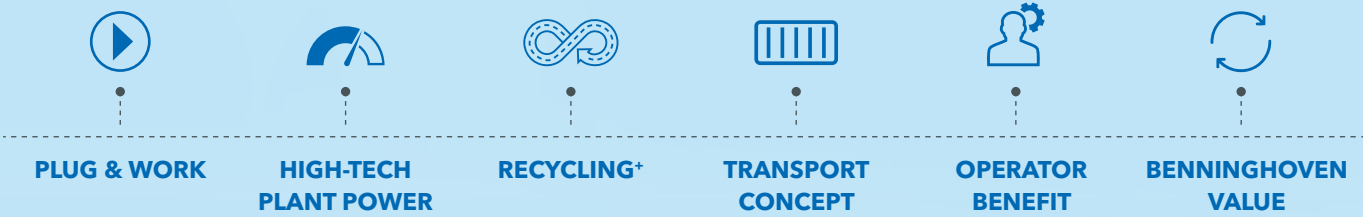
THE MULTI-TALENT

Transportable asphalt mixing plants

The ECO asphalt mixing plant with capacities from 100 to 320 t/h impressively demonstrates BENNINGHOVEN technologies and the high manufacturing standards.

The modular structure makes it possible to integrate a number of high-tech components which can be retrofitted quickly and easily using the “Plug & Work” principle. This enables plant owners to increase both the economic efficiency and the investment security of the plant.

The plant is characterised by a high level of mobility and therefore optimum flexibility. It is suitable for stationary operation but can also handle fast site changes without any loss of quality, delivering a crucial benefit for large temporary construction sites.



THE HIGHLIGHTS

Perfectly positioned.

> Plug & work

- > Fast installation (assembly and dismantling)
- > Modular expansion possible
- > Mobile or stationary foundations - rapid relocation
- > Pre-configured interfaces

> High-tech plant power

- > Wide range of mixing capacities 100 – 320 t/h
- > Hot bin section capacity 17 – 87 t
- > Mixed material storage silo capacity up to 400 t in 8 bins
- > Mixed material storage silo installed in line or parallel

> Recycling⁺

- > Cold recycling up to 40 %
- > Hot recycling up to 70 %
- > REVOC system as an add-on to support compliance with emission regulations
- > Retrofitting possible at any time

> Transport concept

- > Main components in transport-optimized container dimensions
- > Simplified, cost-efficient transport worldwide

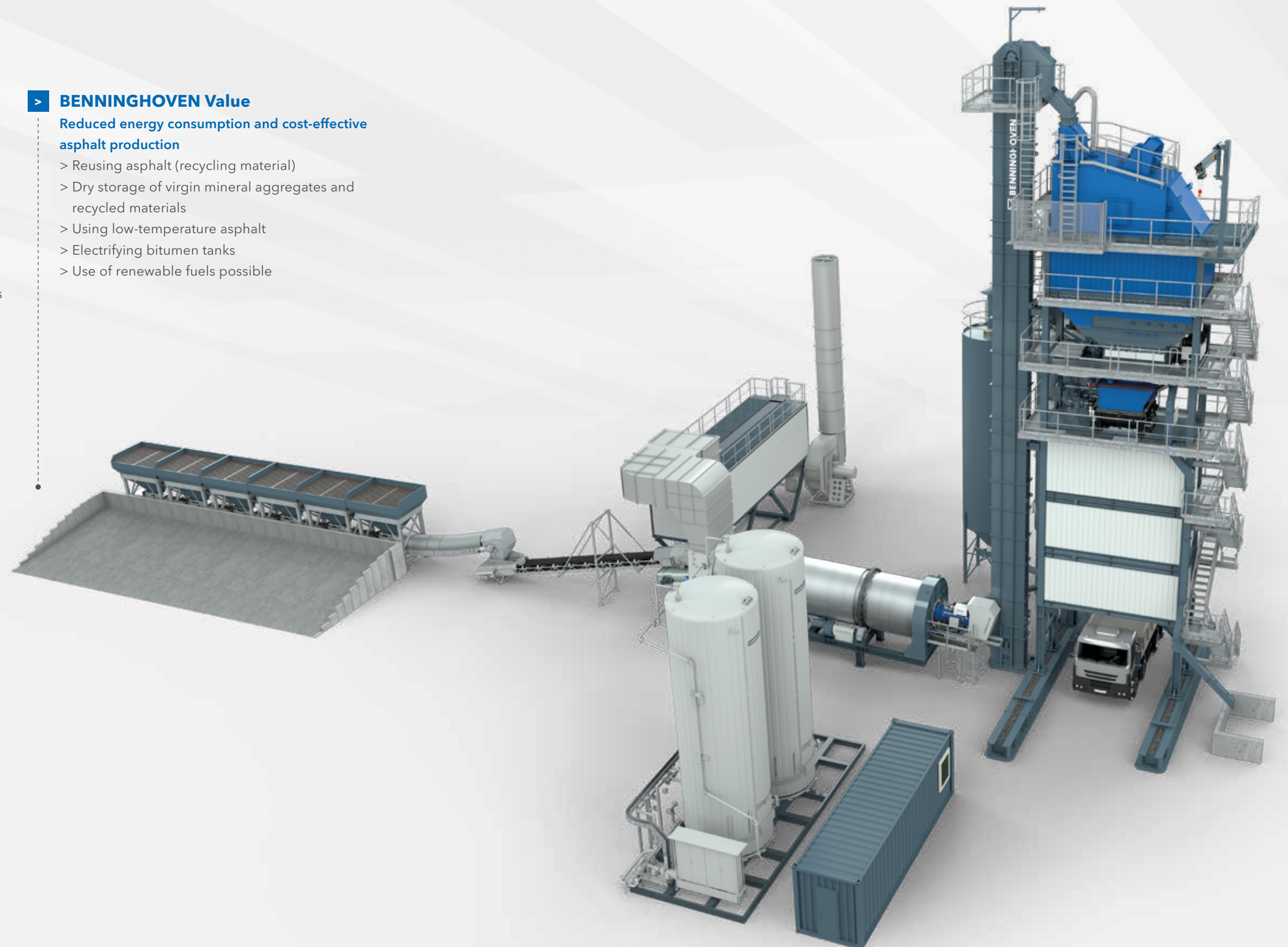
> Operator benefit

- > Ergonomics concept
- > Health and safety
- > Maintenance concept

> BENNINGHOVEN Value

Reduced energy consumption and cost-effective asphalt production

- > Reusing asphalt (recycling material)
- > Dry storage of virgin mineral aggregates and recycled materials
- > Using low-temperature asphalt
- > Electrifying bitumen tanks
- > Use of renewable fuels possible



INTELLIGENT MODULAR SYSTEM

Quickly to work.



Thanks to the intelligent modular system, the ECO asphalt mixing plant features easy assembly and fast readiness for operation.

All sections of this compact plant are already pre-wired at the factory, greatly facilitating handling on site. This allows fast and effective installation. The connections can also be dismantled within a short period of time, transported and re-assembled at a new location. This added value becomes particularly evident at mobile construction sites and large temporary construction sites.

The plant can be installed either on mobile steel foundations or permanent concrete foundations.

 **Modular expansion possible**
with pre-configured interfaces

Fast installation
Assembly / disassembly and relocation

Cost-efficient and flexible
thanks to mobile steel foundations

PRE-CONFIGURED INTERFACES

Added value right from the start.

With their intelligent design, BENNINGHOVEN plants can be adapted in a modular structure at any time to offer added value right from the start.

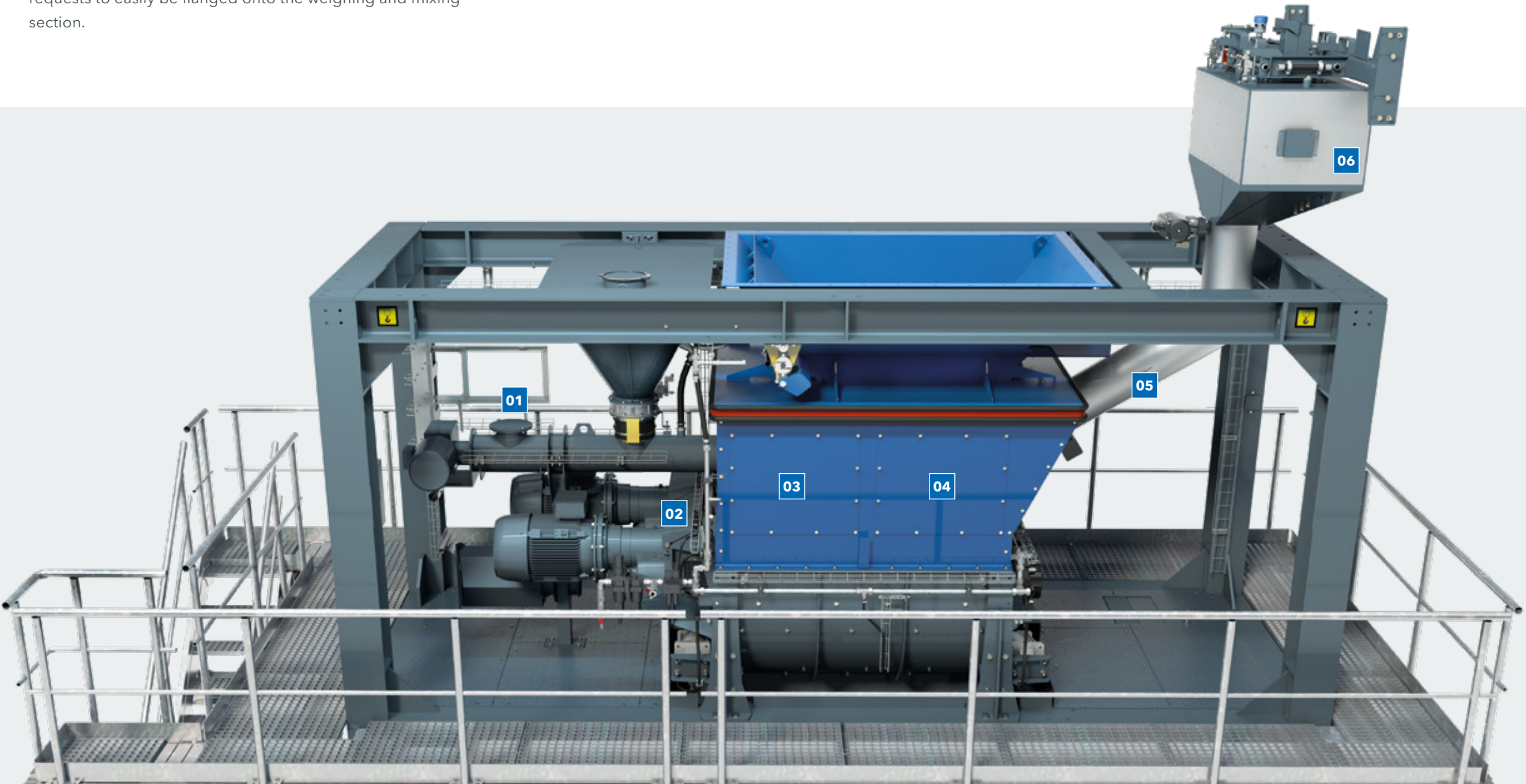
An interface is provided on the plant for each additional technical component. This allows all subsequent retrofitting requests to easily be flanged onto the weighing and mixing section.

Only the blind cover needs to be removed and the connection attached – no further welding or structural changes required.

BENNINGHOVEN > GOOD TO KNOW

The BENNINGHOVEN mixer for the best mixture quality

- > Wide dimensioned mixer design
- > Pre-configured interfaces for adding recycling material, bags, foam bitumen, granulate, powder, fibres and liquide additive
- > Optimum fill level (< 60 %) – no overfilling
- > Highest quality materials for extreme conditions
- > Optimum wear protection, long service life
- > Stable and reliable process
- > Key transfer system for high level of safety



PLUG & WORK

- 01 Granulate dosing system and powder dosing system
- 02 Recycling extraction
- 03 Cold recycling dosing system
- 04 Hot recycling dosing system / bag dosing unit
- 05 Foam bitumen
- 06 Liquide additive system



Modular expansion possible
with pre-configured interfaces

Fast installation
Assembly/disassembly and relocation

Cost-efficient and flexible
thanks to mobile steel foundations

OPTIMUM RELOCATIONS WITH TOP QUALITY

Just carry on.

ECO plants master fast relocations without quality loss, providing a crucial advantage for large temporary construction sites.

Due to the high quality of the components, the plants can be assembled and dismantled as often as required without restrictions.

Despite frequent component movements, this does not cause any warping of the steel supports. This is achieved with a high-quality powder coating and clever designs based on the load classes (earthquake, wind loads, snow loads).

The ECO plants also stand for a high level of reliability and a strong performance without downtimes, which is especially important for prestige projects and large construction sites with very tight schedules.

01 Assembly of an ECO plant 02 Disassembly of an ECO plant



PLUG &
WORK



High level of flexibility
for changing locations

No downtime
thanks to reliable performance

Efficient and quick
planning and execution

HIGH-TECH PLANT POWER

Pure passion.



01 Cold feed system

- > Individual hopper, each 12 m³/16 m³/20 m³
- > Precise pre-classification
- > Flexible installation (I, L or T shape)

02 Bitumen system

- > Optimal storage
- > Efficient heat insulation concept
- > Efficient heating
- > Expanded options with intelligent BENNINGHOVEN technologies

03 Dust collection system

- > Efficient filter function / dedusting
- > Maximum use of space

04 Dryer drum with burner

- > Optimal drying and heating of the mineral
- > Different versions of the drum depending on the requirements
- > Control with frequency converter possible

05 Control cabin

- > Plant control
- > Control of the mixing process
- > Recipe management

06 Foundations

- > Stationary concrete foundations
- > Mobile steel foundations

07 Filler silo

- > Storage of reclaimed filler
- > Optional reclaimed filler loading (loading hose, loading fittings, filler water mixer)
- > Optional storage of imported filler

08 Mixed material storage silo

- > Direct loading or storage
- > Flexible positioning
- > Various expansions (in line or parallel expansion)
- > No mixed material storage silo possible
- > Direct loading up to the storage capacity of 400 t (1 - 7 chambers)

09 Asphalt transfer

- > Direct transfer (up to 53 t mixed material storage silo)
- > Skip track (60 - 400 t mixed material storage silo)
- > Diverter chute (60 - 109 t mixed material storage silo)

10 Weighing and mixing section

- > Fast and precise weighing and dosing
- > Good accessibility
- > 2 t mixer
- > 3 t mixer
- > 4 t mixer

11 Hot bin section

- > 17 - 87 t
- > In 5 or 6 bins
- > Stocking of the prepared mineral according to size
- > Sand / bypass separate or combined
- > Oversize aggregate discharged to outside or into the last bin

12 Screen unit

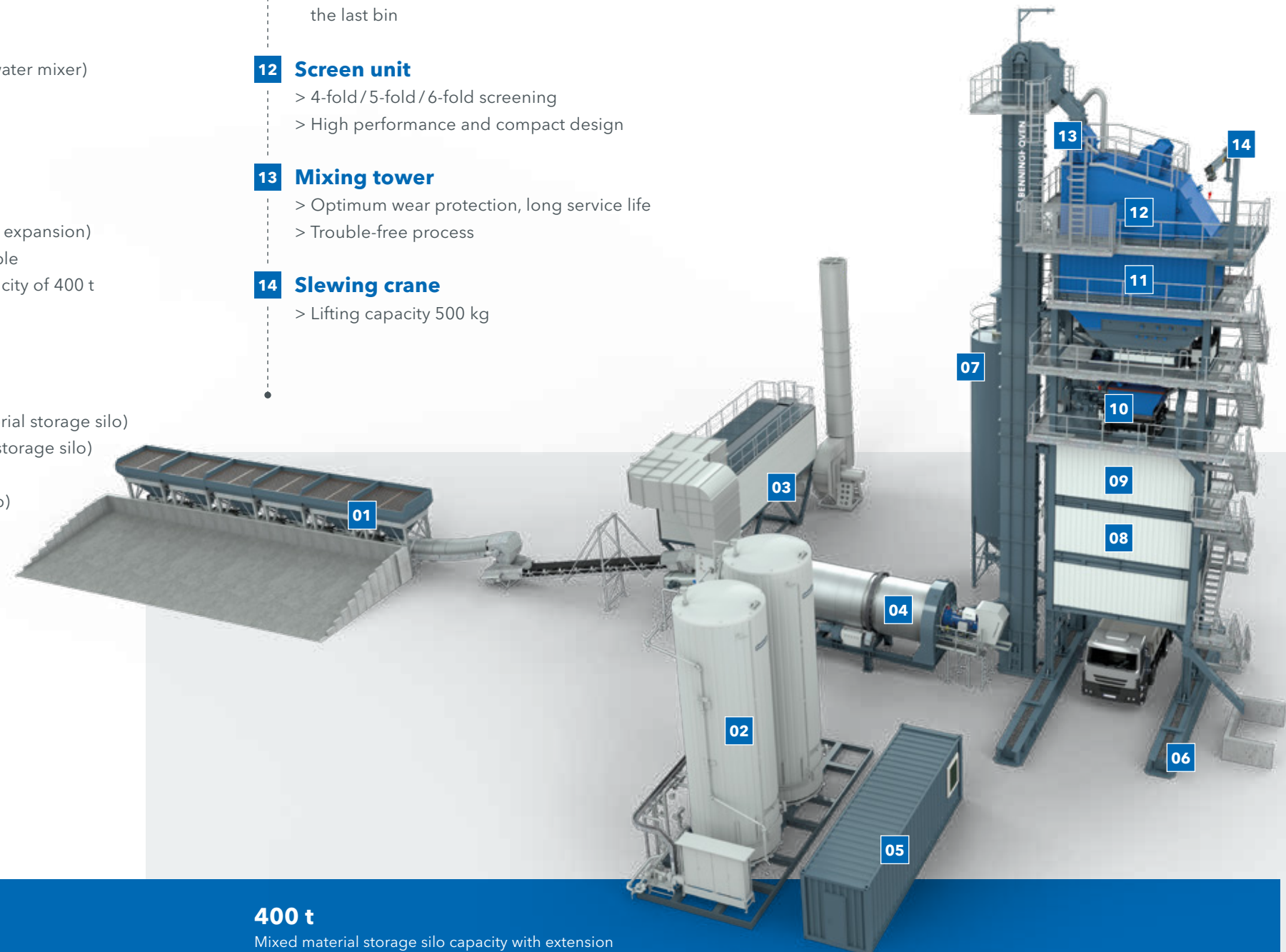
- > 4-fold / 5-fold / 6-fold screening
- > High performance and compact design

13 Mixing tower

- > Optimum wear protection, long service life
- > Trouble-free process

14 Slewing crane

- > Lifting capacity 500 kg



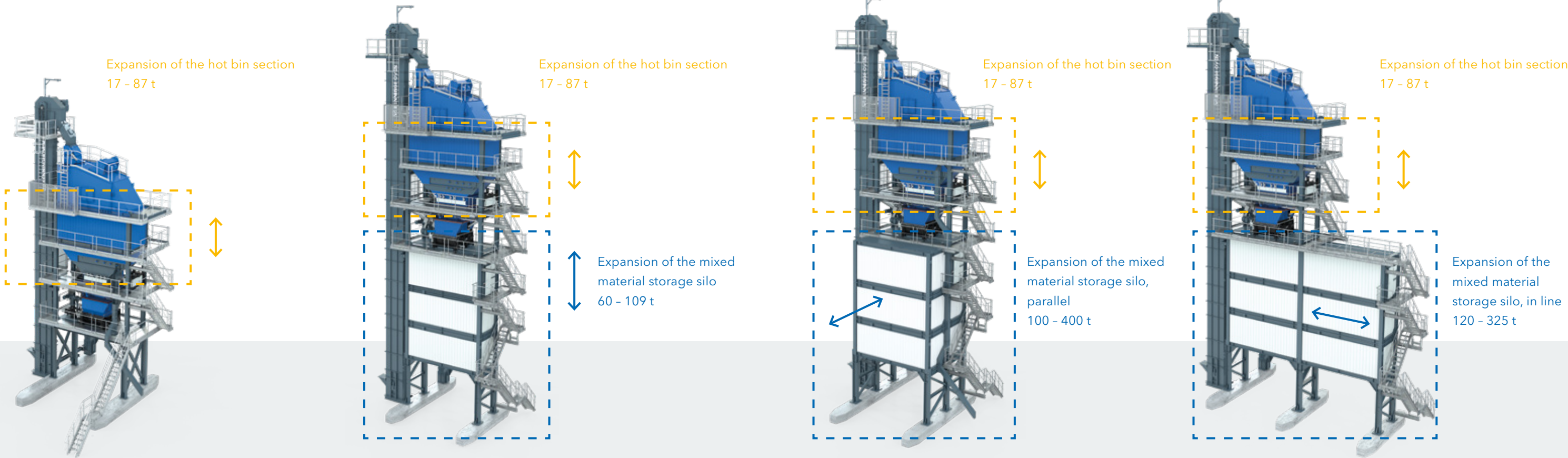
THE ECO VARIETY OF OPTIONS

Thought further.

A clever modular system - composed of modules and adaptable at any time.

The modular BENNINGHOVEN design also enables the integration of a large number of high-tech components which can be quickly and easily adapted to the specific needs of the plant owner, even at a later stage. BENNINGHOVEN ensures this with its pre-configured interfaces (plug & work) which can be activated at any time. Individual configuration of the hot bin section or the expansion options for the loading silo - installed

in line or parallel - are other examples for this. Space constraints that require a highly compact plant, a large variety of recipes that necessitate a large number of storage chambers or the requirement for only one weighing bridge - customer requirements are always individual. With the BENNINGHOVEN modular system, these can be achieved at any time, for future-proof plants that are a reliable investment.



BENNINGHOVEN > GOOD TO KNOW

Asphalt optimisation with feed systems - plug & work

Additives can be introduced into the mixture to optimise the properties of the asphalt. BENNINGHOVEN offers various feed systems for this.

- Feed options:
- > Granulate dosing system
 - > Powder / granulate dosing system
 - > Bag dosing unit
 - > Liquide additive system
 - > Additional customer requests



Flexible configuration
Hot bin section

Flexible expansion
Mixed material storage silo

Individual adaptation
depending on requirements

Time-optimised loading
of a variety of recipes

ASPHALT TRANSFER IN THE PLANT

The choice is yours.

BENNINGHOVEN have always relied on loading skip systems as the link between the mixer and the loading silo. The skip volume corresponds to the volume of the mixer. The mixer drains the asphalt vertically downwards into the skip, the skip then positions itself precisely above the selected loading silo pocket and releases the stored mixture vertically downwards. This is proven technology for excluding segregations in the mixture.

For the ECO series, BENNINGHOVEN offers a cost-effective alternative to the skip track. The patented diverter chute unit is a purely mechanical system and therefore less prone to malfunctions. Active cross-mixing during material transfer minimises separation effects in the end product.

Worldwide functional reliability
and very maintenance-friendly

Purely mechanical structure
particularly resistant to malfunctions

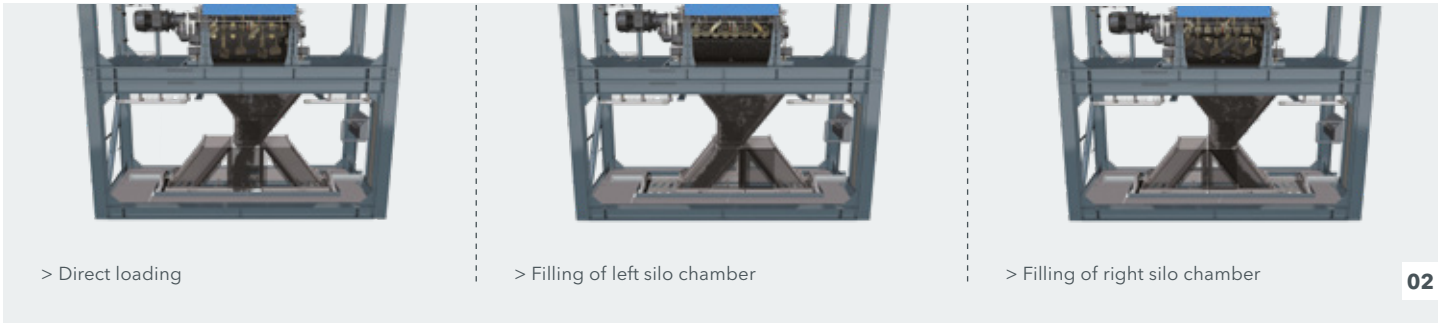
Cost-effective
alternative to the skip track

The diverter chute unit is installed in a steel container designed with standard container dimensions to ensure optimised transport. The unit is clad with profiled sheeting on the outside for weather protection and to prevent thermal losses. Very good access to all areas because the system is so easy to operate and service.

The clever design ensures worldwide process and functional reliability thanks to the purely mechanical design that is resistant to malfunctions. The new diverter chute unit is therefore a cost-effective and convincing alternative to the skip track in the main tower.



01



02

01 Skip track 02 Diverter chute

BENNINGHOVEN > GOOD TO KNOW

Available plant configurations for use of a diverter chute



ECO plants with mixed material storage silo capacities of 60 t



ECO plants with mixed material storage silo capacities of 109 t

BURNER TECHNOLOGY

State of the art.

The MULTI JET burner - pioneering burner technology, ready to go

The BENNINGHOVEN MULTI JET burner combines the stability and robustness of the previous EVO JET models with pioneering technological advances like the new MULTI JET Control burner control system. A key point of focus here is the flexible mixed fuel use, which permits the simultaneous usage of up to four fuels - including 100% hydrogen

- via separate nozzles. This offers a great degree of flexibility when choosing the most economic and most available energy source. Another highlight is the on-the-fly fuel changeover - with no stoppages or production downtime.



BENNINGHOVEN Burner test rig



- > 4 fuels simultaneously in 3 physical states
- > Mixed use of fuels
- > On-the-fly fuel changes
- > Automatic switching during peak loads (gas)
- > Remote access possible
- > Optimised airflow: reduces electrical power consumption by 20%
- > Noise emissions reduced by 5 dB
- > Heat transfer increased by optimised usage of combustion chamber
- > Burner test rig for testing potential alternative fuels
- > Fossil, regenerative, carbon-neutral and zero-carbon fuels all usable

ECO RECYCLING SYSTEMS

Economical and resource-efficient.

The processing of recycled asphalt is a high priority when it comes to conserving natural resources. This fundamental drive for re-using materials is only one of many.

Asphalt recycling brings valuable construction materials back into the circular economy and reduces the need for virgin raw materials. This is just one of many compelling reasons to embrace recycling. Stricter emission requirements and greater economic efficiency make recycling an essential part of modern asphalt production.

BENNINGHOVEN offers a wide range of products and services in the field of recycling feed systems. The main advantage of these technologies is that they conserve natural resources while enabling cost-effective asphalt production.

- Advantages of using recycling materials**
- > Reduced demand for primary raw materials such as aggregates and bitumen
 - > Increased reuse of materials in line with circular economy principles
 - > Potential to reduce transportation and raw material requirements
 - > Greater flexibility in the supply of raw materials and bitumen
 - > Potential economic benefits through the use of reclaimed materials



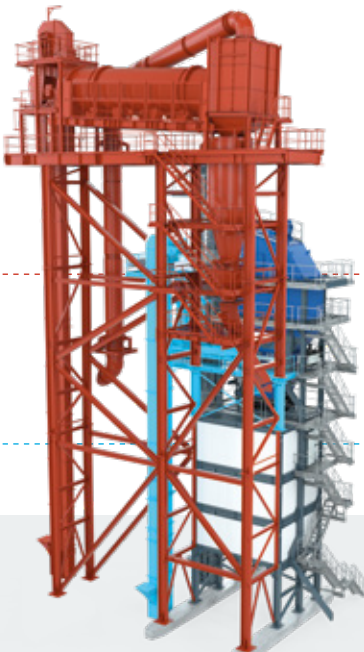
Without mixed material storage silo

- > Optional lateral mixed material storage silo
- > With multi-variable dosing system
- > With parallel drum



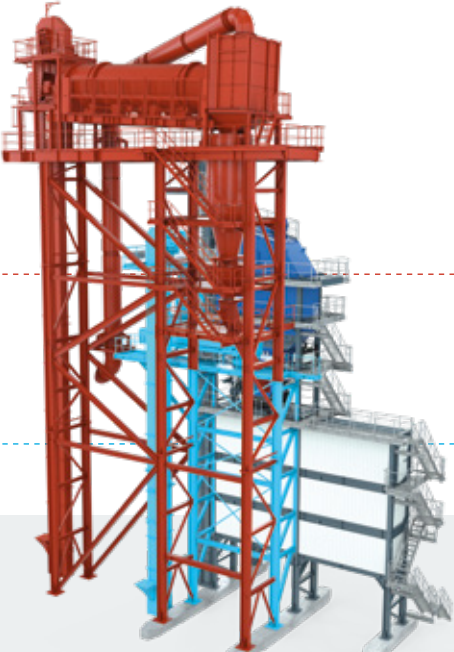
With mixed material storage silo

- > Single mixing tower
- > With multi-variable dosing system



With mixed material storage silo - parallel installation

- > With multi-variable dosing system
- > With parallel drum

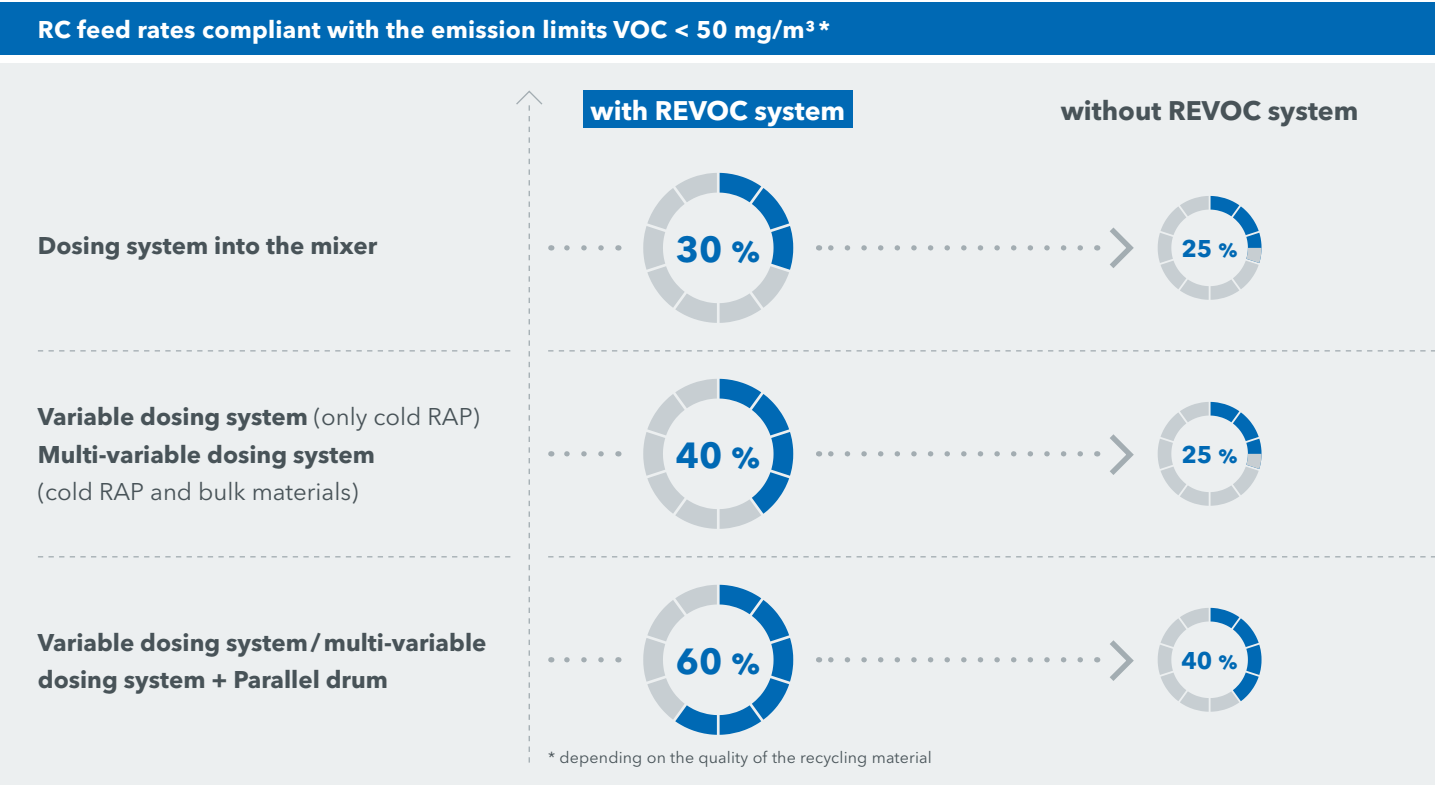


With mixed material storage silo - installation in line

- > With multi-variable dosing system
- > With parallel drum

Hot recycling
Parallel drum 180 t/h,
up to 70 % RAP addition rate

Cold recycling
up to 40 % RAP addition rate





+

- > REVOC system as an add-on to support compliance with emission regulations
- > Supplements existing cold and hot recycling systems

EASY TRANSPORT WORLDWIDE

Saves time and money.

A crucial advantage of the ECO plants is the design of the main components in transport-optimised container dimensions allowing easy transport by road, sea or rail.

The transport-optimised container system allows easy and fast loading, transport, storage and unloading of goods. The transport-optimised shape and size allow for standardised worldwide transport of goods with readily available transport

means and therefore fast turnaround times. The uncomplicated handling allows the plant to be installed worldwide with maximum efficiency.



Container dimensions
for the main components

Intelligent logistics
easy, cost-effective and worldwide

Substantial time savings
with uncomplicated loading



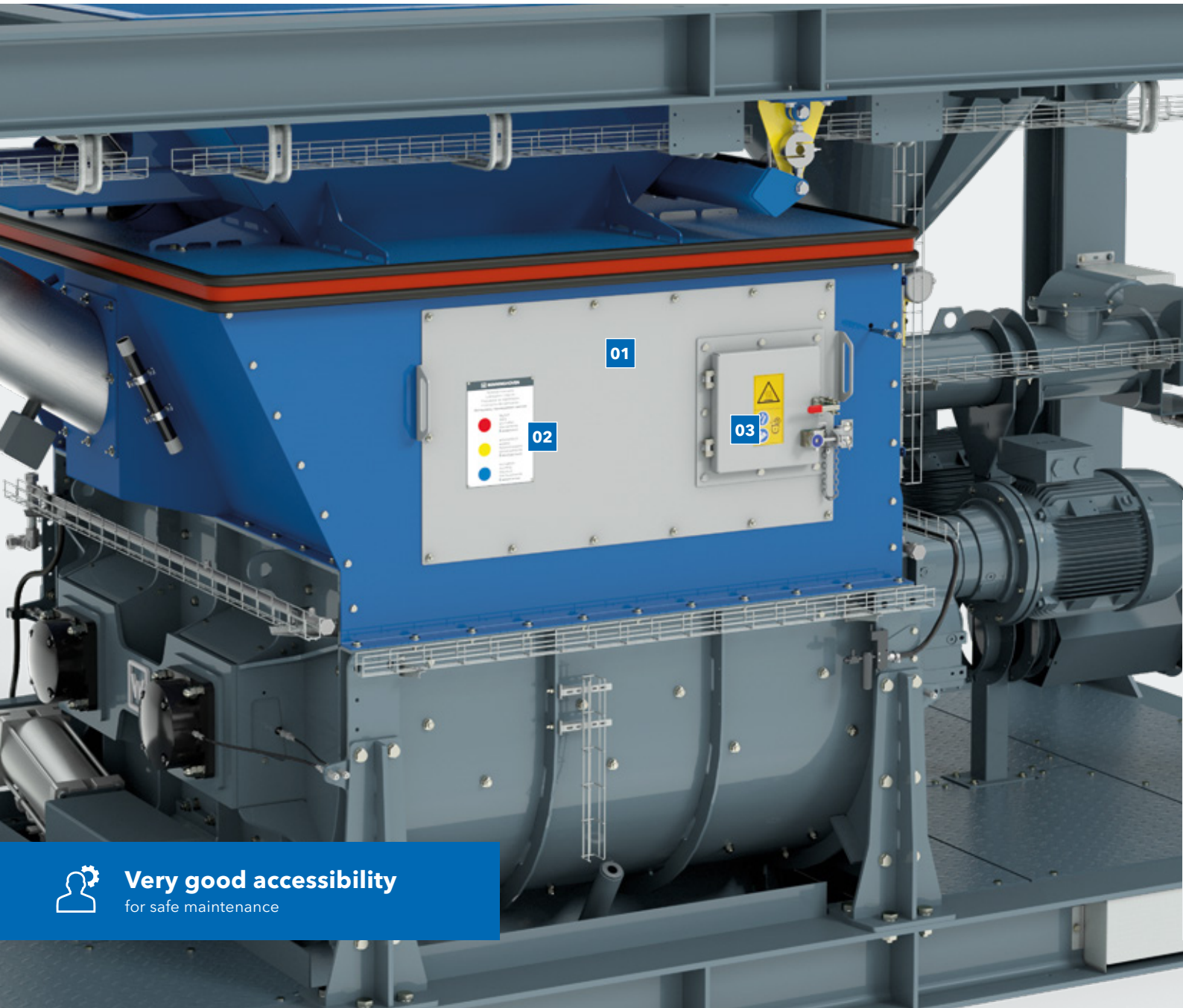
COMPETITIVE ADVANTAGE THANKS TO
INTELLIGENT LOGISTICS

TRANSPORT CONCEPT
WORLDWIDE

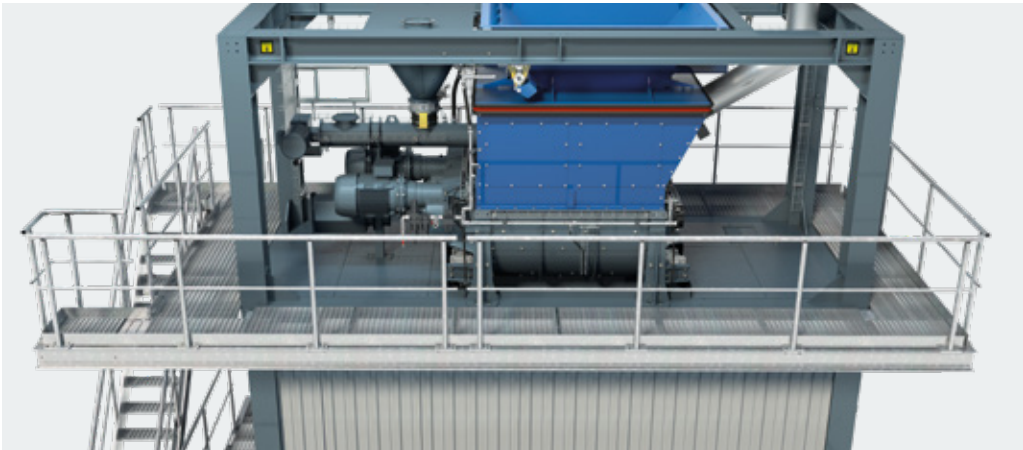
ERGONOMICS, MAINTENANCE, AND HEALTH & SAFETY CONCEPT

Always right in the middle.

The development and design of the BENNINGHOVEN asphalt mixing plants are based on a high level of functionality while prioritising reliable operation and functioning as well as optimum accessibility.



 **Very good accessibility**
for safe maintenance



Very good accessibility to all areas with 800 mm wide surrounding access/working platform

Ergonomics and maintenance concept

- > At BENNINGHOVEN, maintenance access openings always have a size of at least 600 x 600 mm
- > Large expansion space above the mixer allows upright working during service tasks
- > Clever layout of components – easy maintenance, ensured escape routes, health & safety, large installation space
- > Option of forced ventilation (entry into tight spaces) – mixer box, dryer drum
- > Anchor points for PPE
- > Wear parts are mostly bolted on – for good accessibility
- > Most lubrication points are in a central, ergonomic position, with colour coding
- > Power and compressed air connection for tools and maintenance work
- > Central compressed air maintenance unit for oiler and separator, plus filters
- > Platform loads are designed so that even accordingly large spare parts (drive motors above 500 kg) can be stored temporarily
- > Central location of control cabinets in the control cabinet container – air conditioned, high system stability, weather protection, no negative influence from hot components

- 01** Large service openings ensure ergonomic access to the mixer for service and maintenance work
- 02** Intuitive lubrication plan thanks to colour coding of the maintenance intervals (daily – weekly – monthly)
- 03** In most cases, additional inspection covers on large covers for a high level of flexibility





Health and safety concept

- > Design and implementation of the health and safety measures in compliance with the standards (Machinery Directive 2006/42/EC, DIN EN 536 Road construction machines – Mixing plants for road construction materials)
- > Emergency stop button
- > Contact protection on the complete drivetrain of the mixer and on all pneumatic cylinders
- > Encapsulated material transfer areas
- > Optimum illumination of the work and maintenance areas with LED technology
- > Safe access to all service and maintenance points (guard rails, ventilation openings, etc.)
- > Key transfer system for increased safety
- > Cable guiding in compliance with standards
- > Fall protection
- > Anti-slip surfaces (R12)
- > Escape routes ensured – headroom and sufficient width
- > Automatic venting of the pneumatic units for maintenance
- > Elevators with creep drive according to CE regulations
- > Extraction of bituminous vapours during loading (option)

BENNINGHOVEN > GOOD TO KNOW



Key transfer system for increased safety

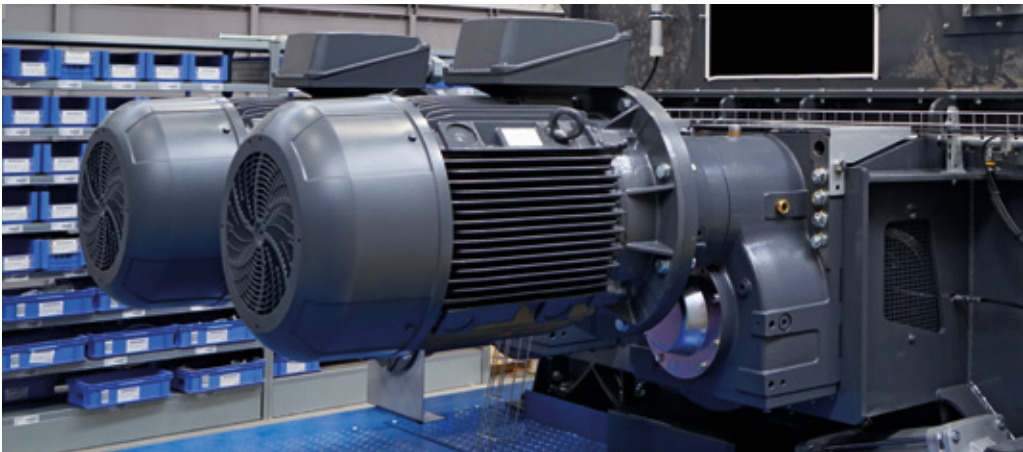
- > Key-operated mechanical system
- > Based on the premise that a key cannot be in two places at the same time
- > The key can only be removed in the safe state if there are no hazards present
- > Safety concept with highly intuitive operation
- > Purely mechanical interlocking device – robust and not prone to malfunctions
- > No manipulations possible



HIGHEST PRODUCT QUALITY

Responsibility from the very beginning.

BENNINGHOVEN has the objective of continuously making improvements across divisions and plants - from design engineering and final assembly to commissioning at the customer site.



Mechanical and electric test run at the factory



Test run at the factory

All core components undergo a test run at the factory. This means that all components are started up “dry” and the mechanical and electrical systems are tested thoroughly. Even for the screen, the factory has a dedicated, decoupled area.

The high level of competence of the specialists at the factory is a crucial factor in preventing faults - before assembly and commissioning in the field.

Surface quality

All components of a BENNINGHOVEN asphalt mixing plant are subject to a defined coating standard with at least corrosion protection class C3M or C4M for steel parts and containers.

Use of renowned suppliers

Design and manufacturing of BENNINGHOVEN asphalt mixing plants and components are carried out at the factory in Wittlich. Only high-quality components and parts (drive systems, sensor systems, electrics, etc.) from renowned, established and reliable suppliers are used to ensure continuous quality assurance.

MAXIMUM CUSTOMER FOCUS

The best recipe: more than 100 years of experience.

Our service does not start only when the order is signed or end with commissioning. The comprehensive customer support at BENNINGHOVEN already starts much earlier on during the preparation phase of a project.

Most importantly, this includes complete and competent support to help you find the best possible plant solution. We believe it is important to take into account technical as well as location-related requirements and to develop an appropriate logistics concept.



Technical support

- > Remote access
- > Application consulting
- > Training
- > Operator days
- > Spare parts
- > Prevention and inspection
- > Retrofit
- > Optimised energy usage



Logistics concept

- > Logistics routes / infrastructure at plant and mixing station
- > Ship and truck loading
- > Transport planning
- > Links between transport and installation
- > Approval process



Plant engineering

- > Technical plant and operating descriptions
- > Installation and layout plans
- > Emissions measurement
- > Safety devices
- > Structural calculations
- > Advice on current standards



Environmental requirements

- > Topography
- > Industrial area / nature reserve
- > Urban planning restrictions
- > Colours / enclosures

FUTURE SOLUTIONS FOR ASPHALT PRODUCTION

Efficient technologies.

From the efficient use of resources to the advanced production processes in our ultramodern main factory, BENNINGHOVEN is a state-of-the-art company in all of the key technologies for asphalt production.

Working with efficient and economical technologies is the challenge we face both now and in the future. To support resource-efficient asphalt production, BENNINGHOVEN offers a wide range of innovative solutions for the use of reclaimed asphalt pavement, for the reduction of process-related emissions and for securing the long-term future of asphalt mixing plant sites. With access to the latest technologies, plant operators not only achieve compliance with tough

legislation but are often able to exceed its requirements. If we consider the entire road construction process - i.e. from material acquisition and asphalt production to road-building - companies can cut carbon emissions by up to 72% in ideal conditions (calculation assumes a 90% RAP feed rate and zero-carbon fuel; source: www.wirtgen-group.com/en-gb/company/wirtgen-group/sustainability/reducing-emissions/).



SERVICE AND GENUINE SPARE PARTS DIRECTLY FROM THE MANUFACTURER

Your experts for a comprehensive plant solution.

Service that you can rely on. You can count on our reliable and fast customer support during the entire life cycle of your ECO plant. Our wide range of services includes solutions for all of your challenges. After all, regular expert service plus the supply of genuine spare parts form the basis for keeping your plant running smoothly and economically while maintaining its value in the long term.



Customer support

- > 24/7 plant availability
- > Avoidance of delays or unplanned downtime
- > Early identification of defective or worn parts
- > Reliable operation
- > Dependable deliveries to your customers
- > Risk minimisation when supplying large construction sites
- > Safe working conditions for your operating personnel
- > A preventive approach to securing the future of the site - you can rely on our support as your service partner



Service

We deliver on our service promise - with fast and straightforward assistance. All our service teams have received specialised training. Repair, service and maintenance tasks can be completed quickly with special tools. If required, we can also provide support via customised service agreements. We provide a comprehensive portfolio of services for your plant: from routine servicing for your burner, elevator, mixer or drum to weigher calibration. We can also organise full site inspections, dedusting and technical support work.

> www.wirtgen-group.com/service



Spare parts

WIRTGEN GROUP original spare parts and accessories ensure a high level of reliability and availability for your ECO plant over the long term. Our experts can also advise you on application-optimised wear part solutions. Our parts are always available worldwide and the ordering process is easy. After all: our common goal as manufacturer and operator is to avoid downtime and the substantial costs associated with such interruptions.

> parts.wirtgen-group.com



Training

Fit for BENNINGHOVEN ECO: even the most user-friendly plant can only achieve its full potential if it is comprehensively understood and safely operated. Training is the key to success here. This is why BENNINGHOVEN gives its customers comprehensive support from the outset. Not only during commissioning but also with aftersales training to optimise workflows and efficiency. Additional training is also offered for the BLS plant control system and the recipe generator - either on site or in an online format. This "driver's licence" for the asphalt mixing plant ensures that all functions can be used to the full. That gives operators peace of mind while ensuring constant product quality in the daily routine.

> www.wirtgen-group.com/training





BENNINGHOVEN



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