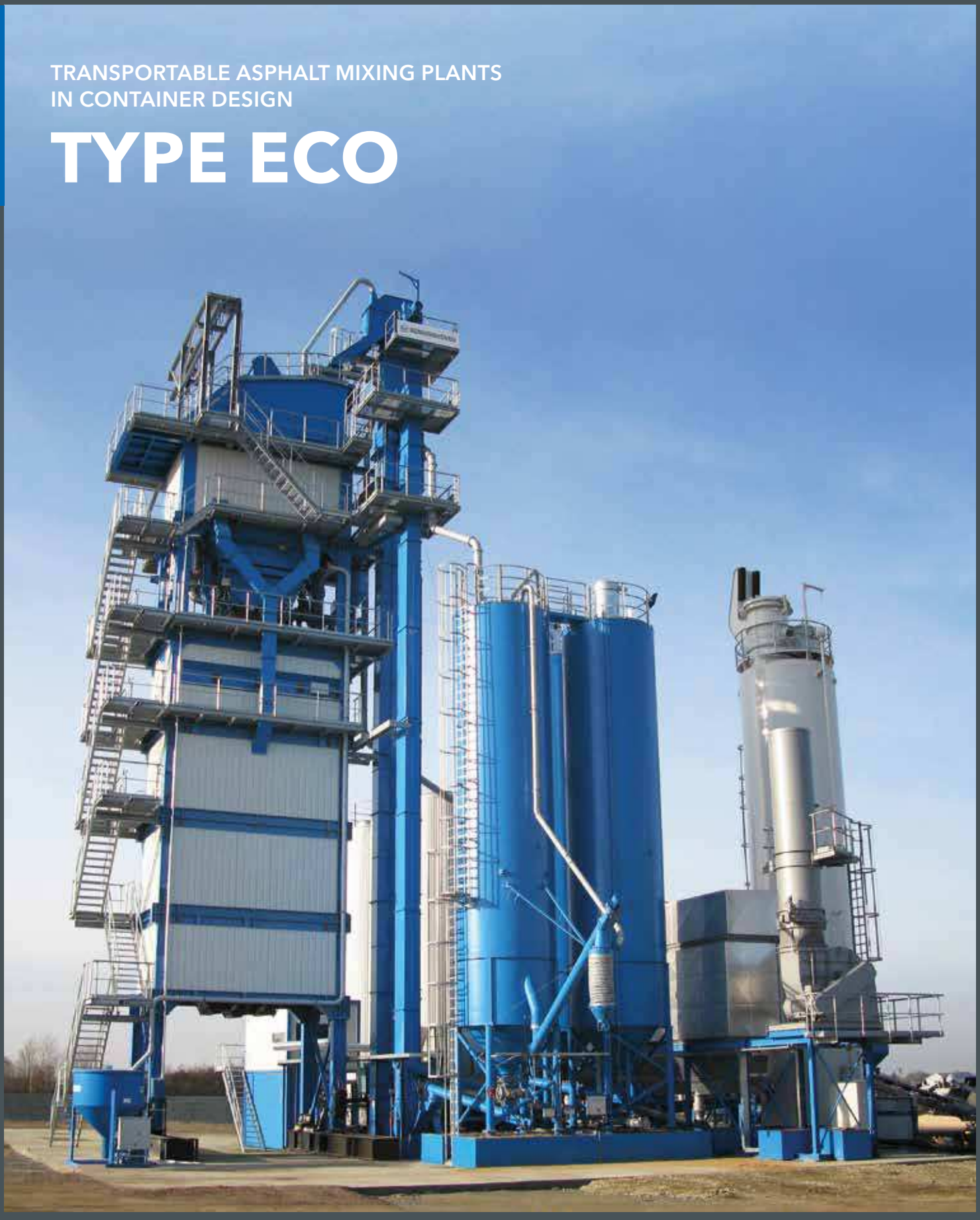
A WIRTGEN GROUP COMPANY

BENNINGHOVEN

TRANSPORTABLE ASPHALT MIXING PLANTS
IN CONTAINER DESIGN

TYPE ECO



Courtesy of Machine.Market

THE TOP 5 FACTS ABOUT TRANSPORTABLE ASPHALT MIXING PLANTS IN CONTAINER DESIGN (ECO)
> CAN BE IMPLEMENTED QUICKLY > IINTELLIGENT MODULAR SYSTEM
> EASY TRANSPORTATION > COMPACT PLANT > LOW LOGISTICS COSTS

BENNINGHOVEN technologies and a high standard of manufacturing are impressively demonstrated in the ECO plant type. These plants, which can be operated at a fixed location or even relocated quickly without any problem, feature ultimate mobility and therefore an optimum level of flexibility. The main criterion of the ECO asphalt mixing plants is the fact that their main components are implemented in standard container dimensions, permitting easy transportation by truck, ship or rail.

Courtesy of Machine.Market

BENNINGHOVEN

BENNINGHOVEN GMBH & CO. KG

THE NEW MIXING CULTURE – MADE IN GERMANY.

We have been specialising in the construction of asphalt mixing plants from as long ago as the 1960s. A company that started with gear wheels and machine tools in 1909 now supplies the leading technology for asphalt mixing plants. With more than 600 employees in Germany and abroad, you can come to us directly for everything – from planning and assembly through to commissioning.

BENNINGHOVEN GmbH & Co. KG is a member of the Wirtgen Group, an expanding, international group of companies in the construction equipment industry.

Courtesy of Machine.Market

PLANT CONCEPT

ASPHALT MODULES.

Thanks to its intelligent modular system, the ECO asphalt mixing plant is impressive due to the fact that it can be assembled quickly and mounted either via firm concrete foundations or mobile steel foundations.

All sections of this plant are already completely pre-wired and pre-piped at the factory, greatly facilitating handling on site. The concept covers capacities from 160–320 t/h, and makes it easy for customers to implement the plant and to dismantle and connect up the components

// ASPHALT MIXING PLANT ECO

// FLEXIBLE AND EASY TO TRANSPORT

The plant's components are based on ISO freight container dimensions of 20 or 40 feet. This makes transportation and relocation quick, easy and costeffective. With its fixed options, the modular system also features a high degree of compactness.

The powerful ECO plants guarantee optimum asphalt mixture quality, true to the motto: big on performance – low on price! Like all BENNINGHOVEN plants, the ECO features high-quality, low-maintenance components with a long service life.

// HIGH DEGREE OF SAFETY

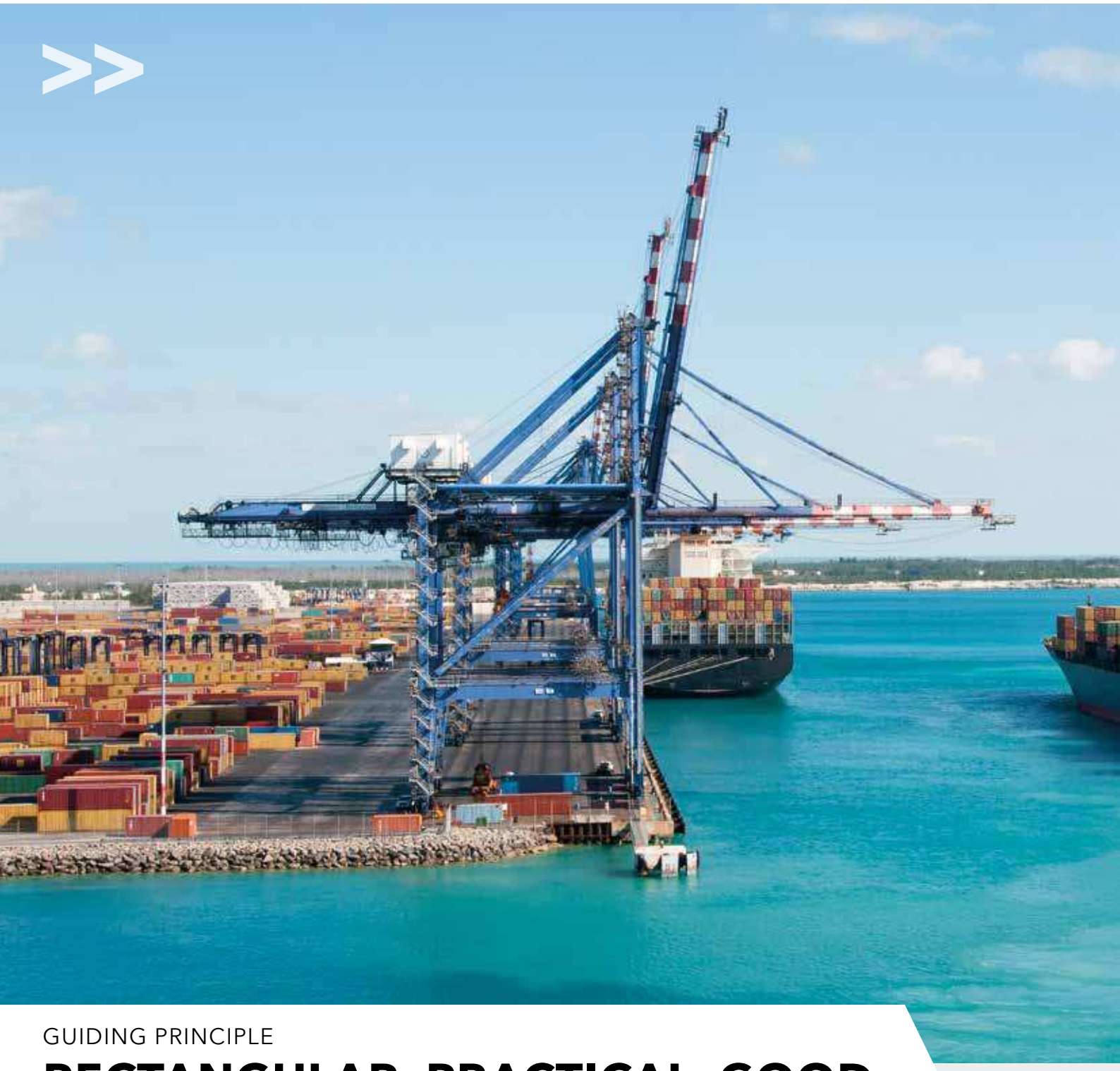
BENNINGHOVEN deems it extremely important to provide safe working conditions. Extensive safety precautions are taken and all safety guidelines consistently implemented at the plants.

Courtesy of Machine.Market

// LAYOUT OF TRANSPORTABLE ASPHALT MIXING PLANT IN CONTAINER DESIGN

01 Cold feed system
02 Dryer drum with burner
03 Dust collection system
04 Filler silos
05 Mixing tower
06 Screen
07 Hot bin section
08 Mixing and weighing section
09 Storage silo – installed underneath in container form
10 Control cabin

Courtesy of Machine.Market



GUIDING PRINCIPLE

RECTANGULAR, PRACTICAL, GOOD.

With the ECO plants, the focus is on making worldwide transportation a possibility, and to make this as simple and effective as possible.

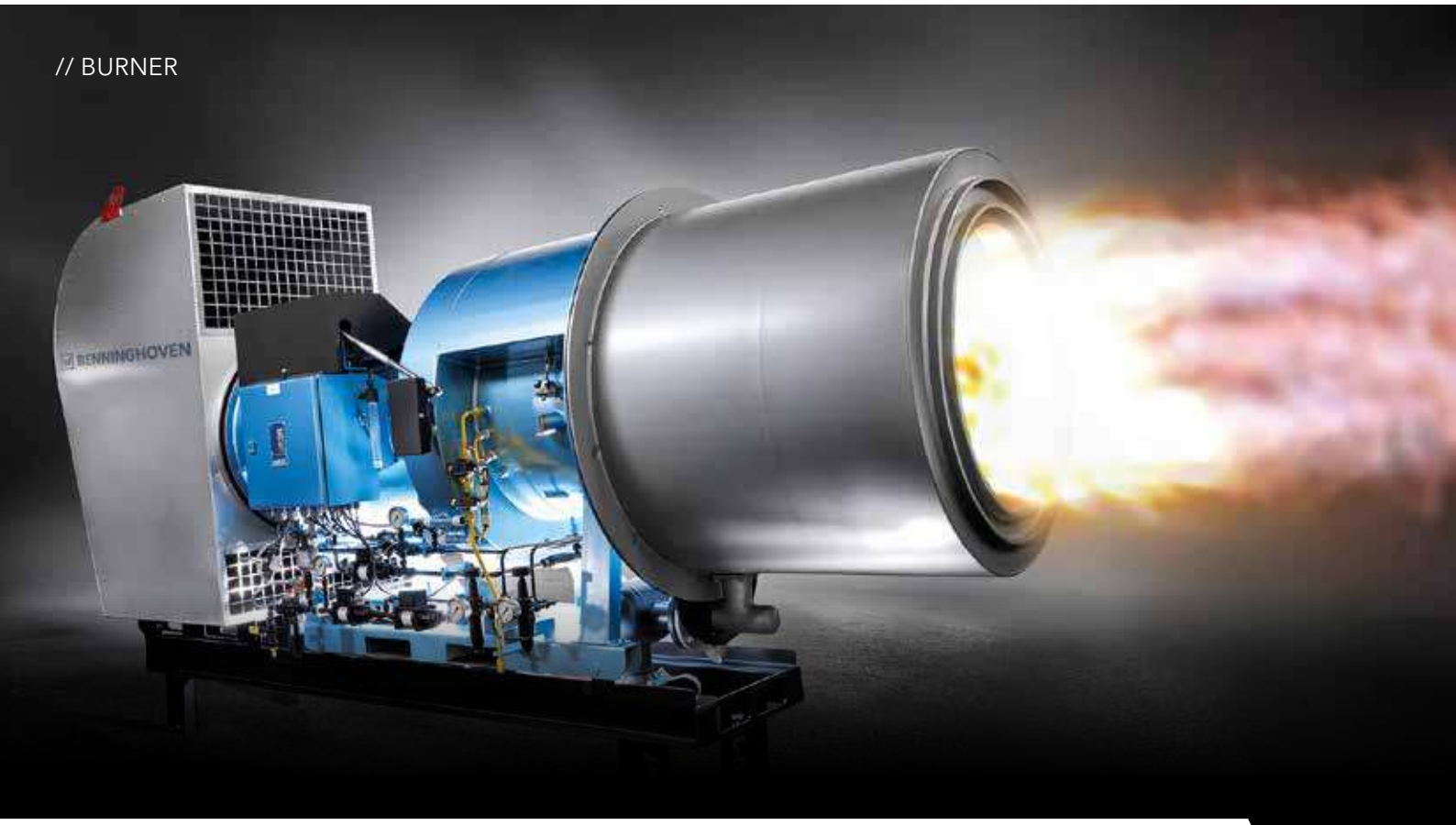
Courtesy of Machine.Market

// ECO 3000 WITH STORAGE SILO INSTALLED UNDERNEATH

The system's components are based on ISO freight container dimensions of 20 or 40 feet and they follow the standardised large-capacity container dimensions. These make it possible to load, transport, store and unload goods quickly and easily. The standardised shape and size means that they can be transported and transferred quickly using a wide variety of transportation means (e.g. seagoing vessels, inland water vessels, rail, trucks).

When you consider that two thirds of cross-border goods traffic is implemented using ships, this really highlights the clear advantages of the plant's design. Besides the transportation factor, this is also demonstrated in the simple "plug and play" installation.

Courtesy of Machine.Market



PLANT COMPONENTS

EQUAL RIGHTS FOR ALL: QUALITY.

// BURNER

BENNINGHOVEN is a world market leader when it comes to burners, and the only manufacturer of 4-fuel burners. The company's essential expertise enables it to develop unique burners with excellent characteristics:

> Simple, modular design
> Compact structure
> Mobile burner for easier accessibility (e.g. for servicing)
> Easy to maintain
> Inspection doors on both sides
> Easy to retrofit
> Internal fan (exclusive at BENNINGHOVEN)
> Long service life
> Low wear
> Highly efficient in terms of consumption
> Minimum pollutant emissions thanks to state-of-the-art control technology

// DRYER DRUM

For the manufacture of asphalt, it is essential to remove the moisture from the base material to ensure bonding with the bitumen. At BENNINGHOVEN, each drum is subject to a 100% final inspection.

In order to attain optimum results, these come in various lengths, diameters or with a variety of installed components, which are suited to the particular circumstances such as the location, aggregates and material moisture. The dryer drum is compact, robust and easy to maintain.

>>

Courtesy of Machine.Market

// MIXER

The mixer is the key component of an asphalt mixing plant. Here, the mineral is mixed intensively with binder and filler to form a homogeneous mass. A mixing cycle, including the filling and emptying, takes 45 seconds. Due to the heavy burden with regard to wear, weight and power transmission, only the highest quality materials are installed in the mixer.

Whether it's a question of special wear plates to line the trough or mixing arms with arm protection, everything is manufactured based on the premise of optimum wear protection. This guarantees the durability of the plant and smooth processing.

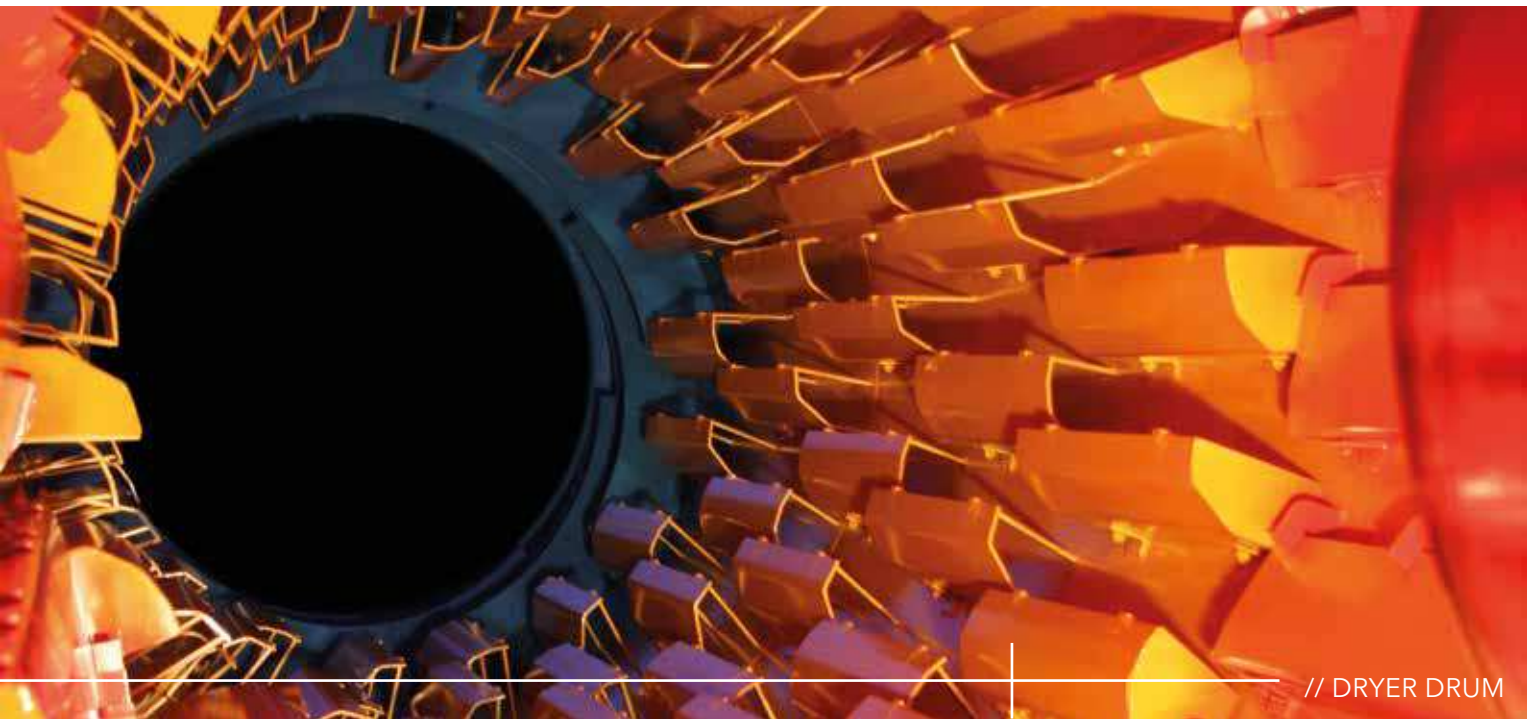
// SCREENING

All transportable asphalt mixing plants in container design feature 5-fold screening as standard. This enables standards and recipe requirements in the various countries around the world to be fulfilled without any problem.

// DUST COLLECTION SYSTEM

The BENNINGHOVEN dust collection system/filter is impressive thanks to its extremely compact structure and modular design. Quick installation is guaranteed thanks to the few simple interfaces.

The dust collection system is also easily accessible for inspection and maintenance; e.g. changing the filter bags is easy and can be carried out without any special tools. The vertical layout of the filter bags guarantees maximum utilisation of the surface area with efficient filter function. Thanks to their high-quality processing and heat resistance, the filter bags have a long service life. An innovative silencer system provides effective minimisation of the noise level.



// DRYER DRUM

Courtesy of Machine.Market

PLANT OVERVIEW ECO 1250/ECO 2000/ECO 3000/ECO 4000

HEAVY-DUTY MODELS.

TECHNICAL DATA **PLANT OVERVIEW ECO**

	ECO 1250	ECO 2000	ECO 3000	ECO 4000
Mixing capacity (t/h)	100	160	240	320
Drying capacity (t/h)	90	145	220	290
General information	All information is based on a material moisture level of 4%, Wind load: 25 m/s, horizontal gravitational acceleration: 0.4 m/s², snow load: 0.85 kN/m²			
Installation types	Stationary= firm concrete foundations; **OPTIONAL** transportable=mobile steel foundations			
Cold feed system				
Number of hoppers	5-fold cold feed system group			
Capacity (m³)	12	12	12	12
Approach ramp	On site			
Loading width (mm)	3,500	3,500	3,500	3,500
Dryer drum				
Type	TT 7.18	TT 8.22	TT 9.23	TT 11.26
Drive rating (kW)	4 x 5.5	4 x 11	4 x 15	4 x 22
Burner				
Type	EVO JET 2 FU ÖI	EVO JET 2 FU ÖI	EVO JET 3 FU ÖI	EVO JET 4 FU ÖI
Optional fuels	Natural gas, liquid gas, lignite – can be implemented as a combi-burner			
Rated heat output (MW)	11.9	11.9	19	23.7
Dust collection system				
Output (Nm³/h)	28,000	44,000	58,000	78,000
Screen/Hot bin section				
Capacity (0-4 mm, t/h)	100	160	220	270
Screening	5-fold screening			
Hot bin section	17 t in 5 bags (sand + bypass together)			
Hot bin section optional	55 t in 5 bags (sand + bypass together)			
Mixing and weighing section				
Mixer (kg)	1250	2,000	3,000	4,000
Aggregate weigh hopper (kg capacity)	1250	2,000	3,000	4,000
Filler weigh hopper (kg capacity)	125	200	300	400
Bitumen weigh hopper (kg capacity)	150	200	250	350
Mixed material storage silo/filler silos				
Mixed material storage silo total capacity	60 t (2 chambers + direct loading)			
Mixed material storage silo optional	120 t (4 chambers + direct loading)			
Filler silos	Reclaimed filler silo 60 m³, imported filler silo 60 m³			
Bitumen system				
	General design stationary, with electric heating and 200 m insulation			
Capacity (m³)	3 x 60	3 x 60	3 x 60	3 x 60

	ECO 1250	ECO 2000	ECO 3000	ECO 4000
Control				
	BENNINGHOVEN control system BLS 3000: switching andpower element, air conditioning unit and low-voltage main distribution system			
Recycling dosing systems				
Middle ring dosing system	–	–	25% RAP material	25% RAP material
Dosing system into the mixer	–	30% RAP material	30% RAP material	30% RAP material

Courtesy of Machine.Market

// ECO 3000

IMPRESSIONS

RIGHT ON THE SPOT, ALL OVER THE WORLD.

Courtesy of Machine.Market

// ECO 2000

// ECO 2000

// ECO 4000

Courtesy of Machine.Market

OPTIONS

WHEN THAT LITTLE BIT EXTRA IS REQUIRED.

// COLD FEED SYSTEM

3-, 4-, 5- and 6-fold cold feed system groups with corresponding approach ramps are available to the customer for precise pre-classification of the white material.
The hoppers are arranged in series above the collecting belt, with infinitely variable, frequency-controlled extraction belts, material flow monitor and material shortage warning indicator.

The different versions offer flexibility of installation, adapted to the local conditions (e.g. T-shape).

Courtesy of Machine.Market

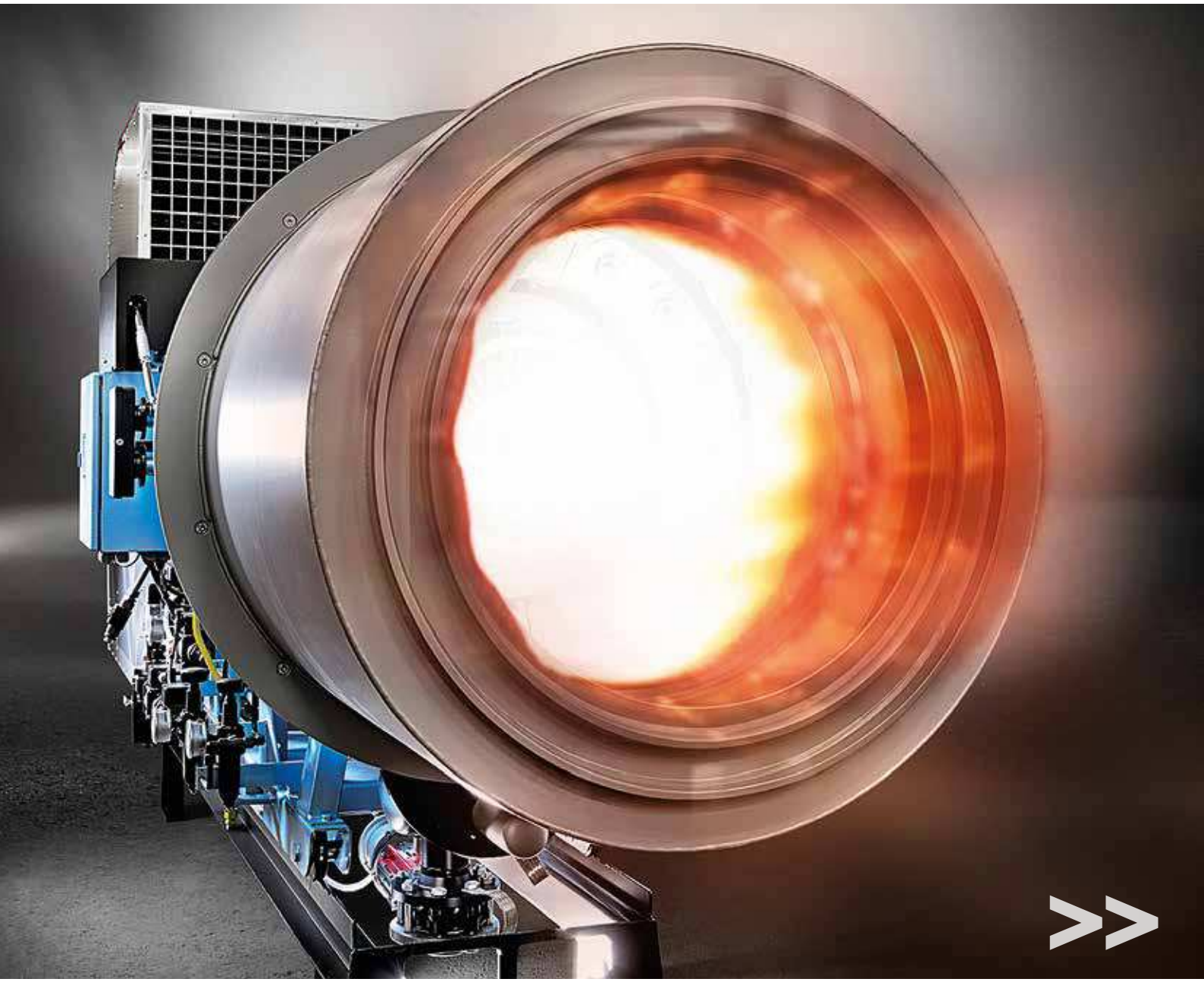
// STORAGE SILO INSTALLED UNDERNEATH IN CONTAINER FORM

An ingenious modular system makes it possible to expand it by adding other components at any time. The total capacity can be increased by doubling the volume to make a total 120 t.

// GRANULATE FEED SYSTEM

In order to optimise the properties of the asphalt, additives can be added to the asphalt mixture. Here, BENNINGHOVEN offers the option of a single or double dosing system and dosing in container design with integrated craneway and enclosure.

Courtesy of Machine.Market



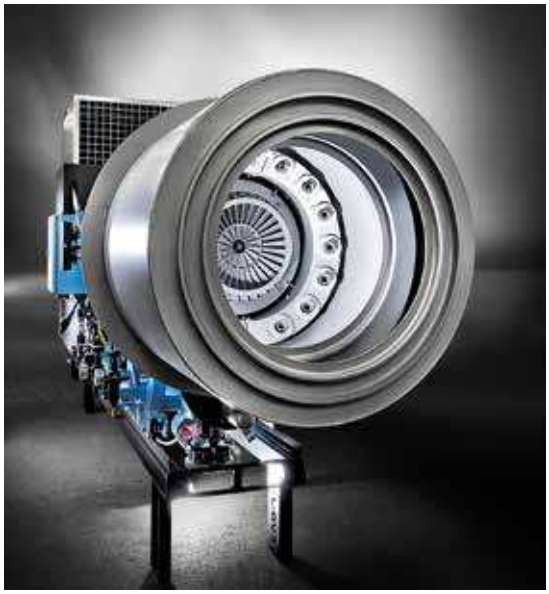
// FUEL CHANGE

The customer has the option of operating his burner, which is responsible for drying and heating the base material, with different fuels. These combi-burners are capable of changing fuel at the touch of a button, guaranteeing independence and flexibility.

A combi-burner also has the advantage of eliminating downtimes for the plant due to a shortage of raw materials or delivery problems. In the event of price fluctuations for any particular fuel, the cheapest can always be selected.

// MORE OPTIONS

> Liquide additive
> Foam bitumen system
> Additives in bags
> Filler loading set
> Filler water mixer



Courtesy of Machine.Market

RECYCLING

FROM VALUE TO ADDED VALUE.

// RAP MATERIAL FEED OPTION

BENNINGHOVEN is your competent partner, offering a wide range of services in the field of recycling dosing systems. Everything is carried out based on the premise of optimum asphaltic mixture quality.

The recycling components are also customised to suit requirements and integrated to make it possible to retrofit existing plants from all manufacturers. With the ECO plant, you can choose between middle ring dosing or feeding into the mixer, depending on your requirements or in line with normative specifications and national requirements.

This promotes environmental awareness, resulting in low CO_2 emissions and conserving resources.

// MIDDLE RING DOSING

> Easy retrofitting of existing plants from all manufacturers
> Gentle heating of the material in the dryer drum

// MIXER DOSING

> Easy retrofitting of existing plants from all manufacturers
> RAP material enters the mixer directly via inclined conveyor or RAP elevator
> The RAP elevator is a space-saving alternative to the inclined conveyor

Courtesy of Machine.Market

CONTROL

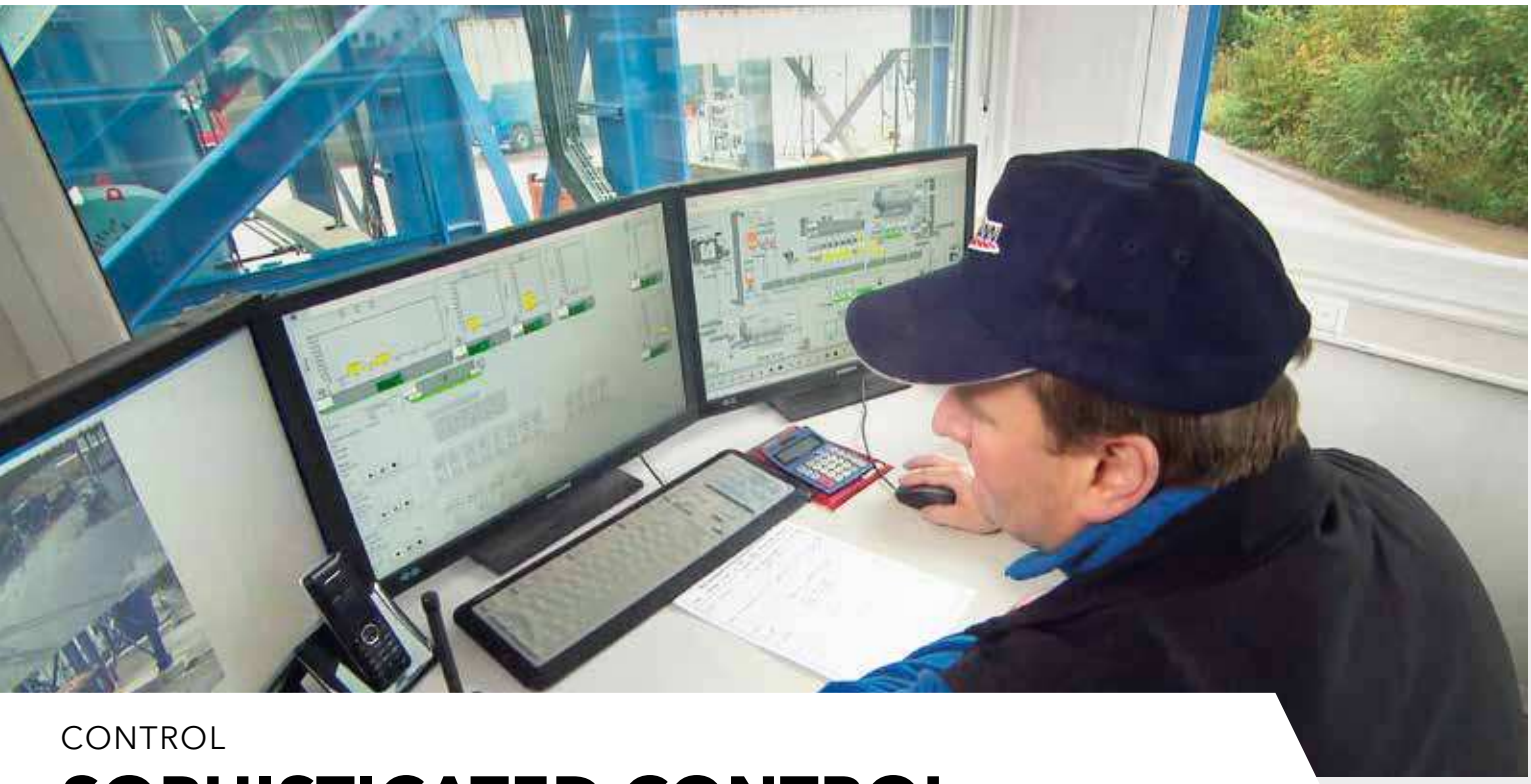
SUCCESS AT THE TOUCH OF A BUTTON.

The BLS 3000 control system features simple, intuitive operation, a very clear structure and perfectly realistic visualisation. All functions and operating elements of the process control system are displayed clearly in the computer animation and controlled with a mouse or keyboard.

Courtesy of Machine.Market

In addition to fully automatic mode, the control system also offers the option of a manual operating level. This allows the mixing operator to control all drives and valves separately. The real time representation of the mixing process with graphical and alphanumerical monitoring of set values and actual values is displayed on the 24" monitor.

Courtesy of Machine.Market



CONTROL

SOPHISTICATED CONTROL.

// MIXING PROCESSES AND DOCUMENTATION

All the plant's mixing processes can be freely selected, so the scales can be filled and the mineral, filler, bitumen and RAP material added to the mixer in any order. Continuous tare compensation is also integrated, and corrections can be made subsequently on the basis of previous mixtures. The uninterruptible power supply ensures operational safety.

The control system for the entire mixing plant is documented in detail and monitored:

> Statistical long term recording of individual components in a database
> Documentation via printer or on the hard drive with data back-up
> Batch record manager for evaluating and viewing the batch report with detailed search capability
> Histographic analysis of components (graphical presentation of frequency distributions)

// RECIPES AND ORDERS

Via the control system, any number of recipes can be input and managed. Base parameters and pre-input can be changed during the mixing operation. Recipe selection and creation, accounting with daily, monthly and annual logs as well as parametrisation are all carried out via the user interface.

Order input is also possible in any quantity. Orders can even be divided into partial orders. In addition, customer orders may be interrupted and others given priority, whereby the remaining amount is stored and can be called up again if required.

// REMOTE SYSTEM

> Remote maintenance – First Level Support
> Connection to the plant's control system is possible at any time (following go-ahead from the customer/ operator)
> Diagnosis and support
> Fault rectification on site with the customer's personnel
> Cost-effective

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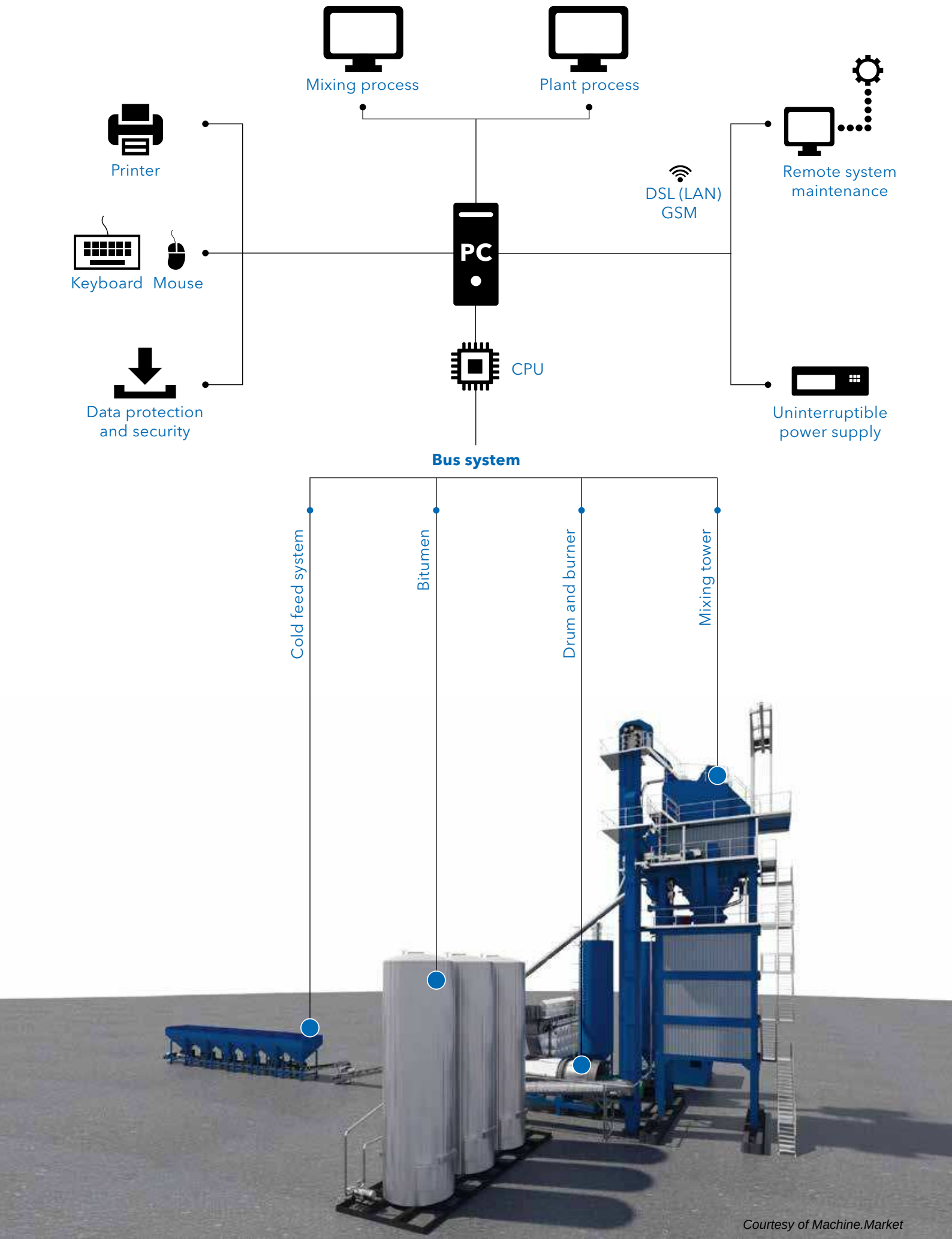
Courtesy of Machine.Market



Courtesy of Machine.Market

ENGINEERING

ADJUSTING THE RIGHT SCREWS AT THE RIGHT TIME.

Our services commence before the order is even signed, and they don't simply come to an end once the product is commissioned either. At BENNINGHOVEN, comprehensive customer support starts much earlier in the run-up to a project.

An asphalt mixing plant needs to be designed in such a way that all substances are available in sufficient quantity, at the correct temperature, at precisely the right time and at the relevant location. Moreover, the processing needs to be carried out in a way that is safe, economical and eco-friendly. We work with each customer individually to process all these requirements, specifically for his site.

Possible site requirements are:

> Industrial area, nature conservation area or mixed-use area
> Topography (plant on a hill or in the valley)
> Requirements of the neighbouring communities (enhance the stack, odour filters and vibration dampers, to combat dust, odours and noise)
> Tailored colouring or enclosure, if the plant should not be recognised as such

Courtesy of Machine.Market

// SHIP LOADING IN NORWAY

Here the finished asphalt is either loaded into trucks or onto a ship. This makes it possible to deliver asphalt to the remote fjords.

// OUR SERVICES DURING THE PRELIMINARY STAGES

> Technical plant and service description
> Creation of layout and site plans
> Assistance with measuring emissions
> Provision of data for the expected noise emissions
> Description of the safety equipment for each plant
> Structural analysis of each plant and location (wind loads, earthquake areas, etc.)
> Advice on the current standards
> Ship and truck loading
> Planning optimum logistics routes at the plant or infrastructure across the entire mixing location
> Planning the logistics for transporting the plant to the customer (type and handling of the trucks, road closures, special ultra-heavy haulage, via road, rail, air or ship)
> Transport logistics for the entire plant in conjunction with appropriate optimum assembly and commissioning

Courtesy of Machine.Market

CUSTOMER SUPPORT AT BENNINGHOVEN

RUNS LIKE CLOCKWORK.

// TECHNICAL SUPPORT

> Troubleshooting
> Service interval consulting
> Field service
> Application consulting
> Specialist staff-sharing in the event of holiday or illness

// INFORMATION SYSTEMS

> Telephone support
> Troubleshooting via remote maintenance
> Online support
> Software updates
> Replacement of old control elements

// LOGISTICS

> Transportation organisation and planning, up to 100 trucks/project
> Assistance with approval procedures
> Organisation of special transportation
> Customs clearance

// TRAINING

> Safety briefing
> Plant briefing
> Operation
> For service technicians
> For plant personnel

// SPARE PARTS

> 24/7 via special courier service
> Planning
> Logistics
> Creation of customer-specific spare parts packages

// PREVENTION

> Prevention and plant inspection
> Individual spare parts consulting
> Consulting on innovative wear protection to extend service life
> Heat and energy optimisation for the plant
> Perfectly prepared for the new season

Good accessibility to all sections provides ideal conditions for inspection and maintenance, for example here we have maintenance-friendly access to the individual screens.

Courtesy of Machine.Market

// RETROFITTING AT BENNINGHOVEN

When you consider that asphalt mixing plants have a service life or operating period of more than 40 years, during this period it is obvious that technology, requirements and standards will change and research findings will conquer the markets.

Accordingly, this creates the need for the asphalt mixing plants to remain in good condition, both internally and externally – by replacing components or general retrofitting of the plants. There are many reasons for this:

> Normal wear
> Upgrading to increase capacity
> Environmental awareness and tighter emission laws
> Reduction of the overall energy balance (e.g. use of heating media for drying, standby mode for units which are temporarily not being used)
> Control system retrofitting, from console control to PC
> Enabling RAP dosing
> Attaining the status quo for plants
> Improving efficiency

BENNINGHOVEN is able to retrofit components not just on its own plants but also on all third-party plants. As a technology leader, BENNINGHOVEN offers ideal solutions for optimising your mixing plants in many areas, e.g. burner technology, RAP systems or bitumen technology.

Courtesy of Machine.Market

CUSTOMER SUPPORT

RIGHT NEXT TO OUR CUSTOMERS.

Our local contacts in sales and service companies provide comprehensive support for all issues and queries relating to our products. This includes diagnosis and technical support, ordering original spare parts and advice on using our products.

Rapid technical support is our top priority. We guarantee a short response time and rapid solutions thanks to a close-knit network of offices, their experienced service technicians and the additional support of our home factory.

Knowing exactly how to operate our plants is the key to using them successfully. To provide your employees with the specialist knowledge they need, BENNINGHOVEN offers a wide range of training courses at our main factory in Mülheim – or we can come to you.

We develop training courses specifically adapted to our customers' needs, which are then delivered by competent employees from our specialist departments.

Courtesy of Machine.Market

// ASPHALT MIXING PLANT

Courtesy of Machine.Market

BENNINGHOVEN

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BENNINGHOVEN_ECO_102016_EN_R1