STATIONARY ASPHALT MIXING PLANTS

TYPE BA / BA-RPP
State of the art! This is an approach that BENNINGHOVEN has followed for over a century. Through consistent further development, growing from a trade workshop to a globally active company, BENNINGHOVEN is a trendsetter in the field of asphalt mixing plants today. The opening of the world’s most modern factory for asphalt mixing plants in summer 2018 was another milestone in our successful history. This allows us to offer our customers the best possible solutions when it comes to producing the highest quality asphalt in an economical process.

BENNINGHOVEN GmbH & Co. KG is a member of the expanding, worldwide active WIRTGEN GROUP which has been part of John Deere since late 2017.
The stationary plant type BA/BA-RPP is the flagship of the BENNINGHOVEN range.

It's all in the mix

Asphalt mixing plants must be designed to provide all compounds in the right quantities and with the correct temperature, at the right time and in the right place. In addition to this, the processes must be safe, economical and environmentally friendly.

The powerful plants of type BA / BA-RPP feature unlimited equipment options and a vast production capacity with optimum asphalt mixture quality. They are always planned as a location concept and individually tailored to the customers’ economic requirements. BA / BA-RPP enables customers to secure the market and dominate it over many years.

Clearly defined position.

Eco-friendly asphalt production

The BA-RPP plants are equipped with “RECYCLING+” and feature a particularly high recycling addition rate of up to 90%. With low emissions, the plant makes an effective contribution to energy efficiency, economic efficiency and active environmental protection.
Clean performance.
RECYCLING DRUM USING COUNTERFLOW ACTION WITH A HOT-GAS GENERATOR

With the recycling drum using counterflow action with a hot-gas generator, BENNINGHOVEN offers an environmentally friendly, future-proof solution that is always a reliable investment.

Everything under control

In classic recycling systems using the parallel flow principle, the temperature is limited to 130 °C by the generated exhaust gas emissions. However, the exhaust gas temperatures physically exceed this, resulting in increased energy consumption and a greater load on the dust collection system. In order for the asphaltic mixture to reach a temperature of 160 °C, overheated virgin mineral must be used in this case.

In contrast to classic recycling parallel drums with the recycling drum, with hot gas generator, the recycled material is heated indirectly in counterflow action. Depending on the quality of the recycled material, even quantities of over 90 % can be added.

As a result, the discharge temperature of 160 °C is the same as the application temperature, while the exhaust gas temperature is only around 100 °C (but above the dew point). This provides key advantages for companies operating asphalt mixing plants.

YOUR BENEFITS:

- High level of economic efficiency by increasing the RAP addition rate to over 90 + x %
- Energy efficiency through low total energy required for operating the plant
- Low emissions below the standard range, allowing compliance with the German TA Luft regulation

BA-RPP with hot-gas generator

Mixer in the RAP tower
Optimised material flow
Recycling drum with counterflow action
RAP addition rates: 90 + x %

COMPLIANCE GUARANTEED:

Technical Instructions on Air Quality Control (TA-LUFT)

Low emissions through hot-gas generator:

Cges < 50 mg/Nm³
The burner burns into the hot-gas generator and intensively heats the circulating air, also using counterflow action. Indirect heating of the RAP material in the recycling drum using hot air – no flame contact.

In the recycling drum, the RAP material is heated gently in counterflow action, which in turn cools the gases.

The material heated to the final temperature is transported directly into the storage silos or added to the mixer.

Low emissions through hot-gas generator: $\text{Cges} < 50 \text{ mg/Nm}^3$

HOT RECYCLING SYSTEMS - PROCESS COMPARISON AND ADVANTAGES

<table>
<thead>
<tr>
<th></th>
<th>RAP parallel drum (parallel flow action)</th>
<th>Recycling drum with hot-gas generator (counterflow action)</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature of RAP material</td>
<td>$130 , ^{\circ}\text{C}$</td>
<td>$160 , ^{\circ}\text{C}$</td>
<td>$\geq 30 , ^{\circ}\text{K}$</td>
</tr>
<tr>
<td>Temperature of virgin mineral</td>
<td>$250 , ^{\circ}\text{C}$</td>
<td>$160 , ^{\circ}\text{C}$</td>
<td>$\leq 90 , ^{\circ}\text{K}$</td>
</tr>
<tr>
<td>RAP addition rate</td>
<td>$70 % \text{ RC}$</td>
<td>$&gt;90 % \text{ RC}$</td>
<td>$\geq 20 %$</td>
</tr>
<tr>
<td>Exhaust gas temperature</td>
<td>$=160 , ^{\circ}\text{C}$</td>
<td>$=100 , ^{\circ}\text{C}$</td>
<td>$=60 , ^{\circ}\text{K}$</td>
</tr>
</tbody>
</table>
Everything considered.
MODEL VARIANTS OF THE BA SERIES

The subtle difference

As part of our comprehensive customer support and our varied product port-
folio, BENNINGHOVEN offers the right plant for your individual requirements.
Targeted planning takes into account economic aspects as well as the local and
legal situation.

BA-RPP HG
- Mixer in the RAP tower
- Recycling drum with counterflow action
- RAP addition rates: 90 + x %
- RAP material temperature max. 160 °C
- Optimised material flow
- Output of the RAP system 180 t/h or 220 t/h

BA
- Mixer in the virgin mineral tower
- Recycling drum with counterflow action
- RAP addition rates: 70 %
- RAP material temperature max. 130 °C

>>

BA: BENNINGHOVEN plant  >  RPP: Recycling Priority Plant  >  HG: Hot Gas generator
Thanks to the flexible modular design, the asphalt mixing plant of type BA/BA-RPP features short project implementation times and fast readiness for operation.

The stationary asphalt mixing plant is manufactured in sturdy container units, each fully assembled and with full wiring and piping. That makes installation very simple. Continuous inner walking platforms and wide access stairs offer comfortable access and safe, uncomplicated maintenance options.

All components are tested thoroughly at the factory and are absolutely reliable.

YOUR BENEFITS:

- Fast and easy installation
- Low design effort
- Housing for essential sections
- Very good accessibility

3 MONTHS IN 8 CONSTRUCTION PHASES

INSTALLATION TIME UNTIL COMPLETION
The impressive plants of type BA/BA-RPP feature strong and reliable plant performance during operation. Optimum quality of the asphaltic mixture is always guaranteed with a mixing capacity of up to 400 t/h.

True strength.

HIGH-TECH PLANT POWER

- **400 t/h** NOMINAL MIXING CAPACITY
- **320 t** HOT BIN SECTION
- **1,100 t** LOADING SILO CAPACITY WITH EXPANSION
Perfectly positioned.

> MIXING / RAP TOWER

- Cold RAP silos
- Multivariable/Variable RAP cold feed system
- Cold RAP elevator
- Recycling drum
- Exhaust gas hood
- Hot RAP elevator
- Cold RAP buffer bin
- Recycling fan
- Recycling line

THE BA-RPP PLANT AT A GLANCE

- Optimum fill level < 60%
- Highest quality materials for extreme loads
- Optimum wear protection
- Insulated mixer
- Assured durability
- Fault-free process

YOUR BENEFITS:

BENNINGHOVEN QUALITY

- Granulate dosing system
- Powder / Granulate dosing system
- Manual bag dosing system
- Liquid additive system
- Foam bitumen system
- Passenger and cargo elevator

IHRE OPTIONEN:

- Rolled asphalt
- Low-temperature asphalt
- Mastic asphalt

PRODUCTION OF:

- Perfectly positioned.
The well thought-out modular system allows expansions with additional components at any time.

**High level of flexibility and individual customisation**

The flexible configuration of the capacities of the loading silo, hot bin section and RAP silos is a great advantage of the BA-RPP plants. BENNINGHOVEN offers the right plant solution for any requirement profile.

**YOUR BENEFITS:**

- Flexible expansion
- Time-optimised loading
- Individual adaptation
- Cost-efficient processes

<table>
<thead>
<tr>
<th>RAP silo variants</th>
<th>Loading silo expansions</th>
<th>Hot bin section variants</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 1 x 45 t</td>
<td>&gt; 355 t (4 chambers)</td>
<td>&gt; 170 t - 7 bins</td>
</tr>
<tr>
<td>&gt; 2 x 30 t</td>
<td>&gt; 440 t (4 chambers)</td>
<td>&gt; 195 t - 13/14 bins</td>
</tr>
<tr>
<td>&gt; 2 x 40 t</td>
<td>&gt; 535 t (6 chambers)</td>
<td>&gt; 270 t - 7/8 bins</td>
</tr>
<tr>
<td></td>
<td>&gt; 660 t (6 chambers)</td>
<td>&gt; 320 t - 13/14 bins</td>
</tr>
<tr>
<td></td>
<td>&gt; 715 t (8 chambers)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 880 t (8 chambers)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 895 t (10 chambers)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 1100 t (10 chambers)</td>
<td></td>
</tr>
</tbody>
</table>
## Performance parameters

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal mixing capacity (t/h)</th>
<th>Drying capacity (t/h)</th>
<th>Bitumen weigh hopper (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 3000</td>
<td>240</td>
<td>220</td>
<td>400</td>
</tr>
<tr>
<td>BA 4000</td>
<td>320</td>
<td>290</td>
<td>600</td>
</tr>
<tr>
<td>BA 5000</td>
<td>400</td>
<td>360</td>
<td>600</td>
</tr>
</tbody>
</table>

## General information

- **Material moisture**: All information is based on a material moisture level of 4%.
- **Foundations**: Stationary concrete foundations.
- **Cold feed unit**: 6-11 individual hoppers.

## Feed ramp

<table>
<thead>
<tr>
<th>Capacity (m³)</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>12</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading width (mm)</td>
<td>3,500</td>
<td>3,800</td>
<td>4,250</td>
<td>3,500</td>
<td>3,800</td>
<td>4,250</td>
</tr>
</tbody>
</table>

## Dryer drum

- **Type**: TT 10.24, TT 11.26, TT 12.30.

## Burner (white mineral)

- **Type**: EVO JET 3, EVO JET 4, EVO JET 5.

## Single fuel burner

- **Burning oil (EL - extra light) or natural gas or liquid gas or heavy oil**: 19.0, 23.7, 35.6.

## Dual fuel burner

- **Combination of heating oil (EL - extra light), coal dust, natural gas, liquid gas, heavy oil**.

## Triple fuel burner

- **Combination of coal dust, heating oil (EL - extra light), natural gas**.

## Dust collection system

<table>
<thead>
<tr>
<th>Output (Nm³/h)</th>
<th>58,000</th>
<th>78,000</th>
<th>96,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screen unit</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Screen output (0-2 mm, t/h)</td>
<td>240</td>
<td>320</td>
<td>320</td>
</tr>
<tr>
<td>Total screen area (m²)</td>
<td>46.2</td>
<td>48.3</td>
<td>48.3</td>
</tr>
</tbody>
</table>

## Hot bin section

<table>
<thead>
<tr>
<th>Model</th>
<th>170 t with 6-fold screening with 7 hot bins</th>
<th>195 t with 6-fold screening with 14 hot bins</th>
<th>270 t with 6-fold screening with 7 hot bins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>170t-TA7, S/B sep., OA out</td>
<td>195t-TA13, S/B sep., OA out with rotary chute</td>
<td>270t-TA7, S/B sep., OA out</td>
</tr>
<tr>
<td></td>
<td>195t-TA14, S/B sep., OA out, with rotary chute, bypass separated</td>
<td>270t-TA8, S/B sep., OA out</td>
<td></td>
</tr>
<tr>
<td></td>
<td>270t-TA13, S/B sep., OA out, with rotary chute, bypass separated</td>
<td>320 t with 6-fold screening with 13 hot bins</td>
<td>320 t with 6-fold screening with 14 hot bins</td>
</tr>
<tr>
<td></td>
<td>320t-TA13, S/B sep., OA out with rotary chute</td>
<td>320t-TA14, S/B sep., OA out, with rotary chute, bypass separated</td>
<td></td>
</tr>
</tbody>
</table>

## Weighing and mixing section

<table>
<thead>
<tr>
<th>Model</th>
<th>Mixer (kg)</th>
<th>Mineral weigh hopper (kg capacity)</th>
<th>Filler weigh hopper (kg capacity)</th>
<th>Bitumen weigh hopper (kg capacity)</th>
<th>Mixed material loading silos</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA 3000</td>
<td>3,000</td>
<td>5,000</td>
<td>600</td>
<td>400</td>
<td>855 t (2 x 80 t + 15 t direct loading 2 x 90 t)</td>
</tr>
<tr>
<td>BA 4000</td>
<td>4,000</td>
<td>5,000</td>
<td>600</td>
<td>400</td>
<td>1,100 t (2 x 100 t + 20 t direct loading 2 x 110 t)</td>
</tr>
<tr>
<td>BA 5000</td>
<td>5,000</td>
<td>5,000</td>
<td>600</td>
<td>400</td>
<td>1,350 t (2 x 120 t + 20 t direct loading 2 x 120 t)</td>
</tr>
</tbody>
</table>

## Filler system

- **Filler tower FC/F1**: RF 135 m³ and IF 2 x 65 m³ or IF 2 x 80 m³ or IF 3 x 60 m³, RF 145 m³ and IF 2 x 65 m³ or IF 2 x 80 m³ or IF 3 x 60 m³.

## Bitumen system

- **Tank version**: Vertical, electrically heated.

## Recycling feed systems

- **Variable dosing system**: 40 % RAP feed quantity (RC only).
- **Multivariable dosing system**: 40 % RAP feed quantity (RC and bulk materials).
- **Parallel drum**: 70 % RAP feed quantity.

## Other feed options

- **Additives**: Powder, granulate, lique additive, foam bitumen, bag feed and fibre.

*FC - Reclaimed filler infeed, central, *FT - Reclaimed filler infeed, top.
**BA-RPP - TECHNICAL DATA**

### Performance parameters

<table>
<thead>
<tr>
<th>BA-RPP 4000</th>
<th>BA-RPP 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal mixing capacity (t/h)</td>
<td>320</td>
</tr>
<tr>
<td>Drying capacity (t/h)</td>
<td>290</td>
</tr>
</tbody>
</table>

### General information

- **Material moisture**: All information is based on a material moisture content of 4%.
- **Foundations**: Stationary concrete foundations.

### Cold feed unit

- **Number of hoppers**: 6-11 individual hoppers
- **Feed ramp**: Provided by customer

### Material collection system

<table>
<thead>
<tr>
<th>BA-RPP 4000</th>
<th>BA-RPP 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity (m³)</td>
<td>12</td>
</tr>
<tr>
<td>Loading width (mm)</td>
<td>3,500</td>
</tr>
</tbody>
</table>

### Dryer drum

- **Type**: TT 11.26, TT 12.30
- **Burner (white mineral)**
  - **Type**: EVO JET 4, EVO JET 5
  - **Burner output (MW)**: 23.7, 35.6

### Single fuel burner

- **Type**: Heating oil (EL - extra light) or natural gas or liquid gas or heavy oil
- **Single fuel burner**: Combination of heating oil (EL - extra light), coal dust, natural gas, liquid gas, heavy oil

### Triple fuel burner

- **Type**: Combination of coal dust, heating oil (EL - extra light), natural gas

### Dust collection system

<table>
<thead>
<tr>
<th>BA-RPP 4000</th>
<th>BA-RPP 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output (Nm³/h)</td>
<td>78,000</td>
</tr>
<tr>
<td>Screen area (m²)</td>
<td>48.3</td>
</tr>
</tbody>
</table>

### Hot bin section

- **170 t with 6-fold screening with 7 hot bins**: 170t-TA7, S/B sep., OA out
- **195 t with 6-fold screening with 13 hot bins**: 195t-TA13, S/B sep., OA out or with rotary chute
- **195 t with 6-fold screening with 14 hot bins**: 195t-TA14, S/B sep., OA out, with rotary chute, bypass separated
- **270 t with 6-fold screening with 7 hot bins**: 270t-TA7, S/B sep., OA out
- **270 t with 6-fold screening with 8 hot bins**: 270t-TA8, S/B sep., OA out, bypass separated
- **320 t with 6-fold screening with 13 hot bins**: 320t-TA13, S/B sep., OA out with rotary chute
- **320 t with 6-fold screening with 14 hot bins**: 320t-TA14, S/B sep., OA out, with rotary chute, bypass separated

### Weighing and mixing section

<table>
<thead>
<tr>
<th>BA-RPP 4000</th>
<th>BA-RPP 5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixer (kg)</td>
<td>4,000</td>
</tr>
<tr>
<td>Mineral weigh hopper (kg capacity)</td>
<td>5,000</td>
</tr>
<tr>
<td>Filler weigh hopper (kg capacity)</td>
<td>600</td>
</tr>
<tr>
<td>Bitumen weigh hopper (kg capacity)</td>
<td>400</td>
</tr>
</tbody>
</table>

### Mixed material loading silos

- **4-chamber loading silo**: 355 t (2 x 80 t + 15 t direct loading 2 x 90 t) or 440 t (2 x 100 t + 20 t direct loading 2 x 110 t)
- **6-chamber loading silo**: 535 t (2 x 80 t + 15 t direct loading 2 x 90 t + 2 x 90 t) or 640 t (2 x 100 t + 20 t direct loading 2 x 110 t + 2 x 110 t)
- **8-chamber loading silo**: 715 t (2 x 80 t + 15 t direct loading 2 x 90 t + 2 x 90 t + 2 x 90 t) or 880 t (2 x 100 t + 20 t direct loading 2 x 110 t + 2 x 110 t + 2 x 110 t)
- **10-chamber loading silo**: 895 t (2 x 90 t + 15 t direct loading 2 x 80 t + 2 x 90 t + 2 x 90 t + 2 x 90 t + 110 t) or 1,100 t (2 x 110 t + 20 t direct loading 2 x 110 t + 2 x 110 t + 2 x 110 t + 2 x 110 t)

### Mixed material transfer

- **Skip track**

### Filler system

- **Filler tower FC/FT**: (reclaimed filler silo and imported filler silo)
  - **Type**: RF 135 m³ and IF 2 x 60 m³ or RF 145 m³ and IF 2 x 60 m³ or IF 2 x 80 m³ or IF 3 x 60 m³

- **Filler tower FT**: (Reclaimed filler silo and imported filler silo)
  - **Type**: RF 2 x 65 m³ and IF 3 x 60 m³; RF 2 x 70 m³ and IF 2 x 80 m³

### Bitumen system

- **Tank version**: Vertical, electrically heated
- **Capacity (m³)**: 60 or 80 or 100
- **Number of chambers**: 1 or 2
- **Insulation (mm)**: 200 or 300
- **Mixing**: Agitator or mixing nozzle

### Control system

- **Model**: BENNINGHOVEN control system BLS 300

### Recycling parallel drum plant

- **Type**: RA 180, RA 220
- **RAP dryer drum**: RT 10.26 HG, RT 11.28 HG
- **RAP drying capacity (t/h)**: 180, 220
- **Hot-gas generator**: Type 2, Type 3
- **RAP burner**: EVO-JET 2 HGE (11.9 MW), EVO-JET 3 HGE (19 MW)
- **RAP storage silo (t)**: 2 x 30 or 2 x 40 or 1 x 45
- **RAP weighter (t)**: 4

### Other feed options

- **Additives**: Powder, granulate, liquid additive, foam bitumen, bag feed and fibre

*FC - Reclaimed filler infeed, central, FT - Reclaimed filler infeed, top
**Added value.**

THE TBA RECYCLING SYSTEMS

BENNINGHOVEN offers a wide range of products and services in the field of recycling feed systems.

**YOUR BENEFITS:**
- Environmentally friendly production
- Multiple cost savings
- Government grants
- Easy retrofitting

**Economical and environmentally friendly**

In addition, the recycling components are adapted and integrated for the retrofitting of existing systems from all manufacturers according to individual customer requirements. With the BA / BA-RPP, you can choose from a large number of recycling systems for hot and cold feed, to suit your demands or normative and legislative requirements.

This strengthens the environmental concept and reduces use of resources.
Always right in the middle.

THE ERGONOMICS, MAINTENANCE, AND HEALTH AND SAFETY CONCEPT

During the development of our systems, we attach great importance to user convenience and a high level of health and safety and functional reliability. The comprehensive and well thought-out concept offers the ideal preconditions for an integrated performance.

YOUR BENEFITS:

+ Very good accessibility to all container sections is ensured
+ Generous internal access to container sections - ideal preconditions for service and maintenance work
+ Large compressor section offers additional space for setting up a workshop, spare parts storage, etc.
+ Container section clad with profiled sheeting, internally accessible, protection against weather, dust, heat and noise
+ Optimum illumination of the work and maintenance areas with LED technology
+ Large inspection access on the mixer cabinet incl. key transfer system
+ Inspection access on the mixer cabinet incl. inspection opening for fast visual inspection
+ Large-dimension expansion space above the mixer allows upright working for servicing
+ Intuitive lubrication plan with colour-coded lubrication points (ergonomic locations)
+ Electric and compressed air connection for tools
+ Extraction of bituminous vapours during loading (+ chimney)

Safety
+ Emergency stop button
+ Key transfer system
+ Contact protection on complete powertrain of the mixer
+ Contact protection on all pneumatic cylinders
+ Encapsulated material transfer areas
The best recipe: more than 100 years of experience.

Maximum customer focus

Our service does not only start when the order is signed or end with commissioning. The comprehensive customer support at BENNINGHOVEN already starts much earlier in 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.

CUSTOMER SUPPORT

Our local contacts in the sales and service companies provide comprehensive support for all issues and queries relating to our products.

Among other things, 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 short response times and rapid solutions with a dense network of offices, their experienced service engineers and the additional support from our head factory.