

A WIRTGEN GROUP COMPANY



BENNINGHOVEN

BURNER TECHNOLOGY



ALL FIRED UP.
BENNINGHOVEN EVO JET BURNER



EVO JET BURNER

Innovative burner technology

BENNINGHOVEN is a world market leader in burners for asphalt mixing plants and a manufacturer of multi-fuel burners with up to 4 fuels. The complete know-how and wealth of experience from over 70 years of burner competence support the development of unique burners with excellent properties.

01 Unique burners with excellent properties

- > Modular design with good retrofit options
- > Compact and clearly structured design
- > Easy maintenance
- > Reliable performance
- > Long service life, low wear
- > Highly efficient consumption (frequency controlled)
- > Minimum emissions output thanks to state-of-the-art control technology
- > Inspection openings on both sides
- > Movable burner for better accessibility
- > Internal fan (exclusive to BENNINGHOVEN)
- > Combination of in-house manufacturing and proven components from renowned manufacturers
- > Everything from one source - engineered + made in Germany



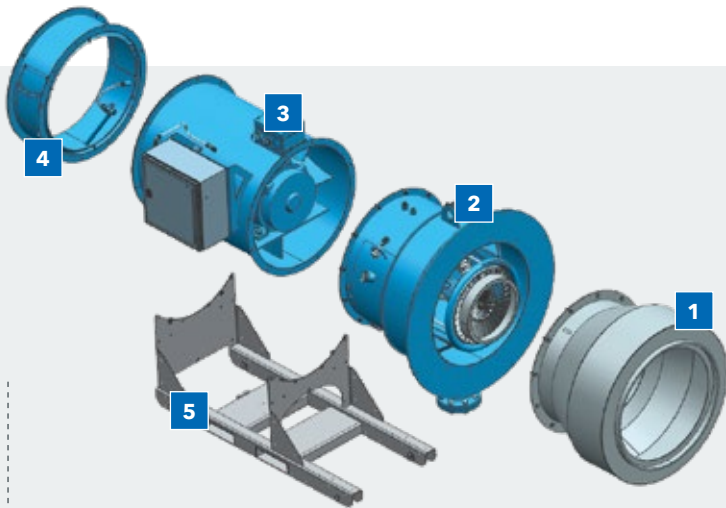
PLUG & WORK

For uncomplicated handling

02 Flexible for the future - burner replacement

- > Burner replacement - new for old
- > A new BENNINGHOVEN burner can use up to four fuels at the same time.
- > Particularly flexible setup for the future
- > Focus: How flexibly can we prepare for the future in order to be able to react dynamically to fuel availabilities, whether fossil, regenerative or carbon neutral
- > Replacing a burner - minimal plant downtime < 1 week

03 Modular structure



- 1. Burner head
- 2. Burner chamber
- 3. Fan
- 4. Intake chamber
- 5. Chassis



4-FUEL BURNER

Fuel change at the press of a button

04 Independent, flexible, cost-efficient

Up to three fuels can be added to a burner, which dries and heats the base material and is designed as a single-fuel burner in its standard version. This turns the burner into a combination burner, which means that different variants of oil, natural gas, liquid gas and all gaseous substances (DME, etc.) available on the market, coal dust, BtL and wood dust can be combined as fuels.

- > No more downtimes of the plant due to lack of raw material or delivery problems
- > In the event of price fluctuations for any particular fuel, the cheapest fuel can always be selected.
- > Flexible use of alternative fuels to enable carbon neutral drying

05 Burner sizes and burner capacities BENNINGHOVEN EVO JET

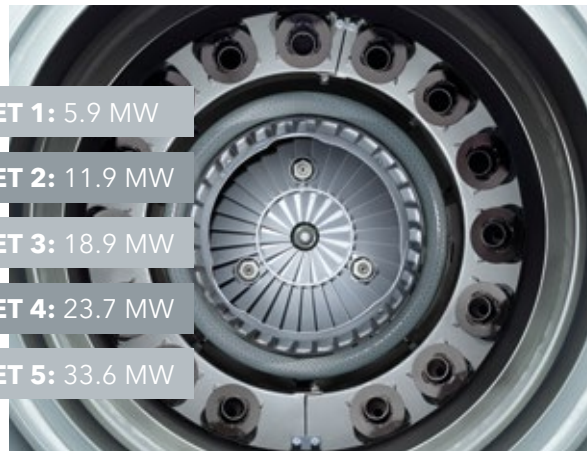
EVO JET 1: 5.9 MW

EVO JET 2: 11.9 MW

EVO JET 3: 18.9 MW

EVO JET 4: 23.7 MW

EVO JET 5: 33.6 MW



Can be individually limited as required by the customer

BURNER TEST RIG

For safe and reliable performance

06 In-house testing

- > Function checks and safety check (leak test, visual check, function check)
- > Burner preconfigured before delivery
- > Service and customer training (complete equipment on site)
- > Testing of new developments (R&D)



07 The BENNINGHOVEN burner guarantee: 100% final test

- > Each burner that leaves the factory has run on the test rig, has undergone thorough testing and is pre-configured for the customer's fuel(s).
- > Mechanical, electrical and process engineering testing

On the ball - and one step ahead

BENNINGHOVEN has a defined development process for burners. This includes an exchange with the customer on the ongoing progress. As part of the immense development expertise, a detailed process is adhered to that extends over several clearly defined phases - from research, engineering and test phases up to the final standard product.

Our customers also benefit from our close cooperation with institutes and authorities, which is reflected in our professional support for approval processes and a smooth process implementation.

08 Use of state-of-the-art development tools

- > CFD simulation - numerical calculation of the flow dynamics to derive recommended actions for optimising components and systems
- > DEM simulation - particle simulation for plant and process optimisation
- > System simulation for visualising and optimising complex interactions



Example: Flow simulation

Easy operation - strong performance

09 Intelligent control system

- > Highly user-friendly
- > Remote service option for direct access to the burner control and diagnostics of individual signal inputs and outputs
- > Monitoring of all switching elements
- > Frequency-controlled fan motor
- > Air volume control through speed regulation of the fan
- > Monitoring of the firing program according to the characteristic curves
- > Coupled control for fuel and air
- > Output control with a temperature sensor for the dryer drum discharge
- > Advance check for availability of components and spare parts
- > Prepared for mixed fuels
- > Implementation of additional fuel curves (characteristic curves)
- > Flying change between curves (burner does not have to be shut down when changing fuels)
- > When using gas as a fuel, expensive peaks can be avoided because the control automatically switches over to another fuel.



Best service for smooth operation

The world's largest and most modern factory for asphalt mixing plants offers optimum conditions for production at the highest level.

As the manufacturer of the plants, BENNINGHOVEN can offer best possible customer service that is perfectly tailored to the asphalt mixing plants. Our specialists have extensive process know-how and are familiar with every little detail of the plants.

10 Correct commissioning

- > Testing and basic configuration of all burners at the factory before delivery (phase 1)
- > Optimum configuration of the burner in conjunction with the plant and the process equipment (phase 2)
- > A correctly configured burner is energy efficient and effective (saves CO₂) and ensures compliance with emissions limits.



11 Your experts for a comprehensive plant solution

- > Easy maintenance thanks to good accessibility and ergonomic design of the burner
- > High level of plant availability and reliability - no failures
- > Carried out by trained qualified personnel
- > Immense process knowledge
- > Key parts are carried in the service vehicle, avoiding additional journeys and costs
- > State-of-the-art measuring equipment (emissions measurement)
- > Optimised burning process with emissions measurements
- > Adaptation of the burner curve to changed operating parameters (moister/drier material)
- > Adaptation to different fuel qualities
- > Analysis and elimination of fluctuations, drops in performance and high consumption
- > Documentation and proof of maintenance directly from the manufacturer - required by the administrative authority (e.g. German TA-Luft regulation)





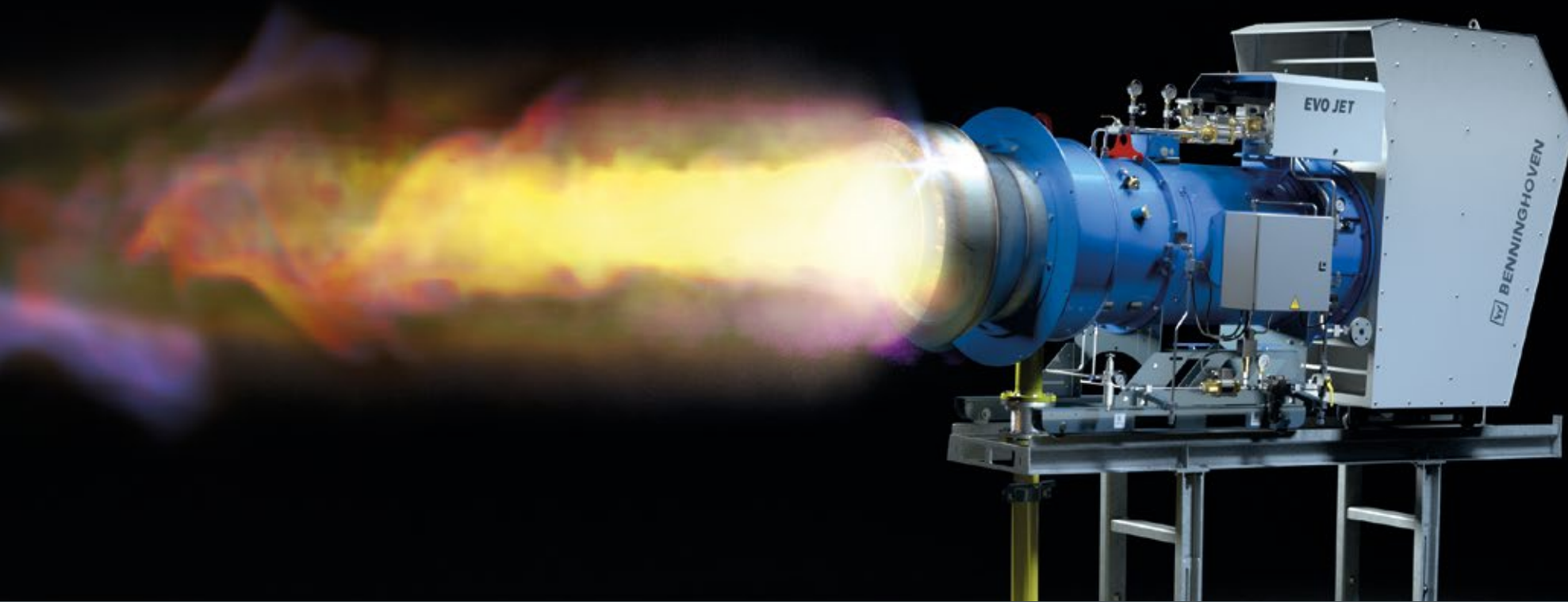
Fuels of the future

When it comes to operating asphalt mixing plants in the most environmentally friendly and sustainable way possible, burner technology combined with a choice of fuels offers the greatest potential.

Many markets are phasing out coal as a fuel, while systems running on oil are subject to increasingly more stringent regulations and restrictions.

These were all good reasons for BENNINGHOVEN to further develop the EVO JET multi-fuel burner for additional, more promising fuels: biomass to liquid and wood dust. When it comes to modernising existing systems and optimising them economically and ecologically, the EVO JET burner is therefore the number one choice as a retrofit solution.





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