Benninghoven | Catalytic converter for asphalt mixing plants nominated for 2022 bauma Innovation Prize

Patented REVOC system brings improved sustainability to the asphalt industry and job security to plants

REVOC is a system for reducing the level of greenhouse gas emissions from asphalt mixing plants. As well as reducing CO2, REVOC can also cut total carbon emissions by up to 50 percent. Thanks to this innovative recycling method, plant operators can meet and even exceed the tighter emissions standards now increasingly applied to reclaimed asphalt production. The REVOC system has been nominated for the 2022 bauma Innovation Prize in the “Climate Action” category.

Asphalt recycling makes a key contribution to the circular economy

Running a profitable business while conserving resources and reducing environmental impacts is not a contradiction in terms. Road resurfacing work always outpaces new road construction, so reclaimed asphalt is not in short supply. At the same time, asphalt mixing plant operators face the challenge of complying with limit values in asphalt production, which have been tightened in many parts of the world. Maximizing the proportion of recycled material used in production is not only a pathway to keeping a business sustainable, but is also a wise move economically, as reclaimed asphalt pavement is significantly cheaper than other aggregates.

Fewer emissions and recycling rates as high as 60 percent

Previously, reclaimed asphalt has been easily incorporated into the production process by utilizing cold or hot recycling techniques. However, this approach results in higher emissions of total carbon (TC) in the form of VOCs (volatile organic compounds). This is because heating reclaimed asphalt causes some of the TC present to evaporate out of the bitumen contained in the asphalt. These VOCs are more potent greenhouse gases than CO2 and are also hazardous to health at higher concentrations. As the proportion of reclaimed asphalt added rises, less fresh bitumen is needed, which also works to shrink the carbon footprint. Increasing the proportion of reclaimed asphalt in asphalt production from 40 to 60 percent can cut annual CO2 emissions by around 440 metric tons. \* Annual production 100,000 t, coal dust as fuel.

In the past, trying to reconcile high recycling rates for reclaimed asphalt with the need to avoid environmental impacts was effectively impossible. Compromises are a thing of the past with the high-performance REVOC system, however: TC emissions can be reduced by up to 50 percent while achieving recycling feed-in rates of up to 60 percent.

Energy-efficient thermal post-process treatment

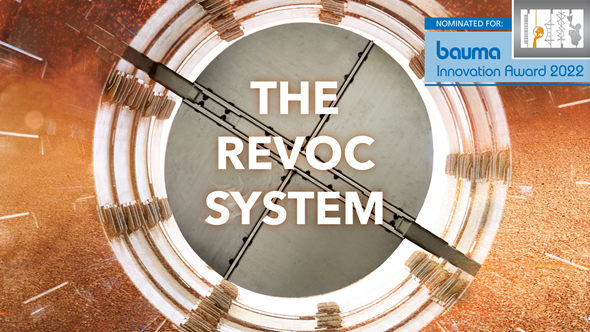
The first step in the REVOC process is to capture the waste gases directly at their place of generation. First and foremost from the mixer in the asphalt mixing plant: where heated aggregates, recycled material, and bitumen come together and are mixed into fresh asphalt. The vapors created at this stage have high concentrations of TC and are routed into the REVOC system for thermal post-process treatment.

The REVOC system greatly improves energy efficiency by re-using the energy already generated for drying and heating the virgin mineral (primary function) for thermal post-treatment of total carbon compounds (secondary function). This approach not only significantly reduces energy consumption but also halves TC emissions (reductions of as much as 50 percent). Validated data from several REVOC systems have shown that this environmentally friendly technology is already achieving practical results.

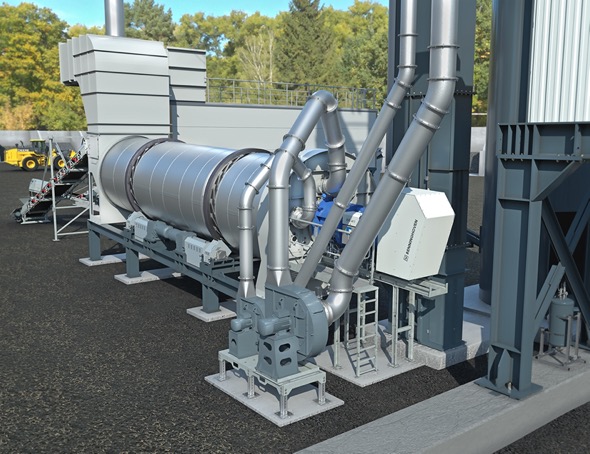
Future job security at mixing plants

The REVOC system is a practical system that offers existing mixing plants a pathway to compliance with tougher standards imposed by national regulators. In Germany, these regulations are codified in the “Technical Instructions on Air Quality Control” (“TA-Luft”). With the REVOC system, however, operators can reliably stay below the strict limits specified by TA-Luft of <50 mg/m3. As a straightforward retrofit for any asphalt mixing plant, the system can upgrade existing plants to the industry state of the art. This is a key consideration for plant operators looking to achieve job security at their site, given the typical 20- to 30-year lifespan of an asphalt mixing plant.

Photos:



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The REVOC system has been nominated for the 2022 bauma Innovation Prize in the “Climate Action” category.



BENNINGHOVEN\_REVOC\_bauma\_nominated\_innovation\_award\_2  
Most total carbon compounds are reduced by Benninghoven’s REVOC system. This achieves a higher rate of recycled material feed-in and more sustainable asphalt production.



BENNINGHOVEN\_REVOC\_bauma\_nominated\_innovation\_award\_3  
Benninghoven’s REVOC system is a straightforward retrofit for any asphalt mixing plant. The system can upgrade existing plants to the industry state of the art.

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