**Benninghoven** | **RECYCLING AT THE HIGHEST LEVEL: RAP IN COUNTERFLOW – THE SOLUTION FOR THE FUTURE!**

**The asphalt industry is continuously looking for better solutions to optimise the processes within asphalt mixing plants. One essential approach is to increase the volume of reclaimed asphalt added to all formulations.**

Parallel flow recycling drums are in operation worldwide today in all sizes and capacity levels. This technology has proven successful over decades and has undergone continuous further development by the plant manufacturers. But any concept, no matter how good, eventually reaches its limits. This is also the case for heating reclaimed asphalt in a parallel flow process where the material flows in the same direction as the heat generation. The exhaust emissions of this process limit the outflow temperatures to 130 °C.

The physical properties of parallel flow drying and the corresponding negative properties such as the higher exhaust gas temperature compared to the product temperature as well as the resulting high emission values and the increased energy consumption have prompted us to take a completely new approach.

**Heating recycling material in counterflow**

The recycling material is now heated in counterflow. That means that the material flows against the heat source in the drum. This achieves higher material temperatures while lowering the exhaust gas temperature. The outflow temperature of 160 °C corresponds to the further processing temperature while the exhaust temperature is above the dew point at about 100 °C.

Positive effect for the virgin material: The material no longer has to be run overheated, which results in a clear energy reduction. The entire process is only possible with the use of a hot-gas generator as direct firing would burn the recycling material and make it unusable. Burner, hot-gas generator, dryer drum, separator cover and circulating air system are precisely balanced.

The burner automatically moves forwards and backwards on its chassis, depending on the operating condition. Afterwards a partitioning element moves in or out. This procedure was developed especially to prevent damage to the components inside the burner after shutting off the firing. Without this partitioning, the burner would not be protected from the chimney effect and the resulting hot air rising from the recycling drum. When the burner is restarted, the partition moves out and the entire unit moves back into the operating position.

The burner supplies the heat energy required for drying and heating the recycling material. It burns into the hot-gas generator where the flame is intensively mixed with the circulating air, also in counterflow. The RAP material is therefore heated only indirectly through the hot air – emission values are below the standard range.

In the drum, the RAP material is heated gently in counterflow across the length of the drum which in turn cools the gases. The material heated to the final temperature is transported directly into one of the two storage silos. There it is conveyed across a weighing station and fed into the mixer. The cross section of the exhaust hood is large enough to let the exhaust gases rise up very slowly, taking along the smallest possible amount of fine particles. The separated particles drop into a collecting trough and are fed into the drum discharge from there. This maintains the grain composition of the raw material. This process is necessary to reliably maintain the stricter emission values in future as well.

Photos:

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|  | **BE\_N\_RC\_Heissgaserzeuger\_1**  *Recycling drum using counterflow action with a hot-gas generator* |

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|  | BE\_N\_RC\_Heissgaserzeuger\_2Recycling drum using counterflow action with a hot-gas generator |

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|  | **BE\_N\_RC\_Heissgaserzeuger\_3**  Recycling drum using counterflow action with a hot-gas generator |

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|  | **BE\_N\_RC\_Heissgaserzeuger\_4**  With this innovative technology, Benninghoven already complies with tomorrow's standards. |

*Note: These photos are intended for preview only. For printing photos in the publications, please use the photos with a resolution of 300 dpi available to download from the Wirtgen Group web pages.*

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