

Catalytic and Thermal Post Combustion Systems



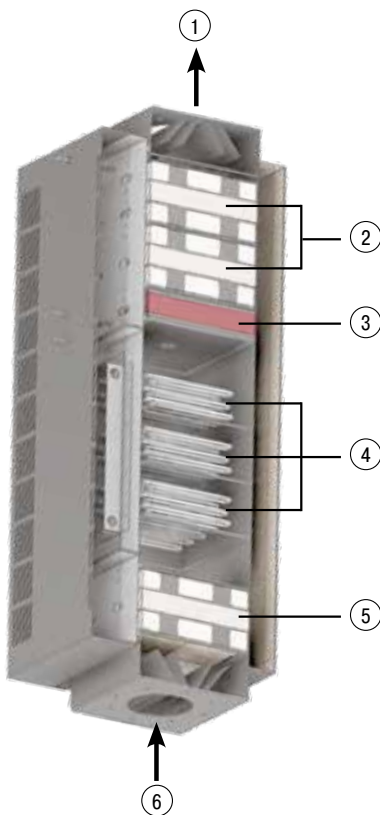
Catalytic post combustion system

For cleaning of exhaust gases especially during debinding, Nabertherm offers post combustion systems tailored to the process for furnace solutions with the safety package for debinding DB200. The post combustion is directly connected to the exhaust gas path of the furnace and accordingly integrated into the controls and the safety matrix of the furnace.

Catalytic Post Combustion Systems (KNV)

Catalytic post combustion systems are useful for oxidation of pure hydrocarbon compounds during debinding processes in air. They are recommended for small to medium-sized exhaust gas volumes.

- Perfectly suited for debinding processes in air with only organic exhaust gases
- Decomposition of gases in carbon dioxide and water
- Integrated in a compact stainless steel housing
- Electric heating provides for preheating of the exhaust gas to the optimal reaction temperature for catalytic treatment
- Cleaning in different layers of catalytic honeycombs within the system
- Control thermocouples for the post combustion and to measure the outlet temperatures
- Over-temperature limiter with adjustable cutout temperature protects the catalyst
- Tight connection between the exhaust gas outlet of the debinding furnace and the exhaust gas fan with corresponding integration into the overall system with respect to control and safety technology
- Catalyst dimensioned in relation to the exhaust gas flow
- Measuring port for clean gas measurements



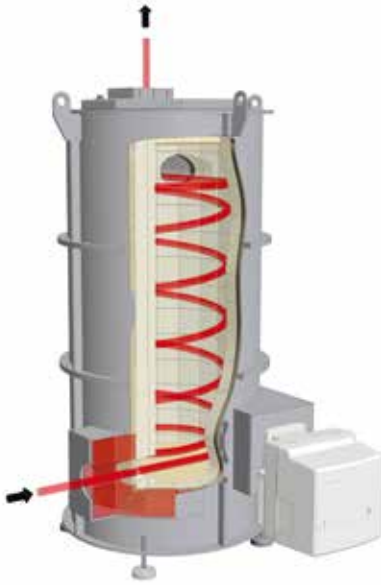
Scheme of a catalytic post combustion system:

1. Outlet for treated exhaust gases (clean gases)
2. Catalytic cleaning
3. Sacrificial layer
4. Heating elements
5. Honeycomb
6. Inlet for exhaust gases



Forced convection chamber furnace NA 500/65 DB200 with catalytic post combustion system

Thermal Post Combustion Systems (TNV)



Scheme of a thermal post combustion system (TNV)

Thermal post combustion systems are used if large volumes of exhaust gas from the debinding process in air must be cleaned and/or if there is a risk that the exhaust gases might damage the catalyst.

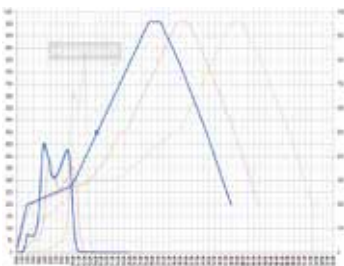
The thermal post combustion system is optimally suited for debinding processes in air with large exhaust gas flow, erratic large exhaust gas volumes, large volume flow or for debinding processes under non-flammable or flammable process gases

- Gas-fired to burn the exhaust gases
- Burn-off at temperatures up to 850 °C provides for thermal decomposition of the exhaust gases
- Heating with compact gas burner with automatic firing device
- Thermocouples in the combustion chamber and in the raw gas inlet
- Over-temperature limiter for protecting the thermal post combustion
- Design depending on the exhaust gas flow
- Measuring port for clean gas measurements (FID)



Forced convection chamber furnace
NA 500/06 DB200-2 with thermal post combustion system

Process Optimization by Nabertherm with Flame Ionization Detector (FID)



Process curves before and after optimization

The binder removal often accounts for the largest part of the overall process time. Consequently, there is a lot of potential in this process step to reduce the cycle time.

For process optimization, Nabertherm offers a production accompanying analysis of the debinding process by means of FID measurement. The aim of the measurement is to determine a possible reduction of the process time, an increase in throughput and an associated reduction of production costs. Based on the recommendations, the customer checks and validates the practical feasibility with respect to the material properties of his charge.

- Process analysis including FID measurement and recommendations for potential process optimization
 - Recording of the current raw gas values using FID measurement
 - Evaluation and determination of periods with lower vaporization activity
 - Provision of the FID measurement device
 - Preparation of the evaluation and reports
- Process adjustment
 - Proposals for an optimized temperature profile
 - Implementation of the proposal, by performing one process cycle with accompanying measurement and evaluation after the customer has approved the proposal
 - Recommendations for the customer to carry out further optimization steps if feasible