

Extraction and Separation for Die-Casting Processes



THE TASK

During series production of thin-walled components made of non-ferrous metal, liquid casting metal is pressed with high pressure and with high speed into a metallic mold.

To easily separate cast parts from the mold, but also to influence surface quality, the molds are sprayed with releasing agents. The molds are additionally greased at critical points. Because of the heat produced when filling-in the liquid metals, these releasing agents evaporate, burn in part and turn up as fume.

Capturing, extraction and separation of these dusts / fumes is mostly mandatory due to reasons relating to production, product specifics or employment and environmental law. Handling of finest dust emissions is often hindered as they may be harmful, toxic or carcinogenic.



THE SOLUTION

Keller has many years of experience and extensive know-how in extraction and separation of die-casting machines when producing aluminum, zinc and magnesium.

Our technology is successfully established in most fields of application. A modular design and individual customization of our systems guarantee an ideal solution and advantages for your demand.



ADVANTAGES:

- individual consulting by our specialist engineers
- wide experiences
- effective extraction and separation of harmful substances
- protection of workers in their workplaces
- no risk of fire, as there are no ignition sources within the separator
- robust filter technologies
- clean air recirculation because of low residual emission values
- low-maintenance and reliable operation



FILTER TECHNOLOGY

Different solutions are available for individual applications:

Emulsion mist separator

ENA as centralized and local system

Wet scrubbers

TA-Venturi wet scrubbers as centralized and local system

Both systems equipped with ductwork flushing and circulating water system to reduce cleaning efforts and assignment of personnel.

EXTRACTION BY MEANS OF EMULSION MIST SEPARATOR: ENA (centralized and local)

This extraction system is suitable when using water-soluble sprays and lubricants. The separator is equipped with two filter stages made of stainless steel. Filter stage 1 is to pre-clean and to align the incoming air towards filter stage 2. Both filter stages are regenerative. The separator's filter section is equipped with an automatic rinsing, i.e. according to a set time the filter stages are rinsed with water by means of built-in nozzles. The filter stages can be easily demounted.



EXTRACTION BY MEANS OF VENTURI-WET SCRUBBER TA

(centralized and local)

Our Venturi wet scrubber is equipped with a Venturi nozzle at the crude gas inlet which accelerates and moistens the polluted air. Separation between mud and air occurs within the separator by means of centrifugal force. The polluted water drops are led to a water processing basin via return pipe, and the cleaned air is led to the atmosphere by means of a ductwork system with fan.



CLEANING METHODS - EMULSION MIST SEPARATOR ENA

To minimize standstill times of separator systems Keller developed the following automatic filter stage cleaning methods.

1. Filter stage rinsing via hot water/high pressure

The filter stages are cleaned with high pressure and at a temperature of approx. 90°C.

2. Cold water rinsing and Venturi nozzle cleaning

Behind capturing, a pre-nozzle is built-in according to the Venturi-principle. Approximately 90 % of the captured solids are bound to the sprayed water, separated from filter stages and extracted air, and led to a separate water basin. Pollution of the filter stages is clearly reduced. Pollution of ductwork can also be clearly reduced by means of this system.

For an easy cleaning the separator lines are equipped with separate filter stages.

CAPTURING

Keller provides two possible solutions for capturing: Extraction hood as an upper hood or extraction hood as exhaust partition with blast feed-line..

EXTRACTION HOOD - UPPER HOOD

Upper hoods are the most effective and most economical way of capturing pollutants above die-casting machines. The stream of upward moving emissions is completely utilized for capturing dust particles. A precondition, therefore, is a sufficient inflow velocity into the hood as well as sufficient space to capture emission peaks. The closer the hood is placed upon the machine, the smaller the extracted air volume. Furthermore, upper hoods consist of a mobile part for easy tool exchange.

EXTRACTION HOOD-EXHAUST PARTITION WITH BLAST FEED-LINE

The exhaust partition with blast feed-line is a simple and useful possibility to capture emissions. Fumes which vertically leave the machine are led toward the capturing element by means of an air blast where they are captured and exhausted.

Experience has shown that this kind of extraction should only be used in particular cases; as constraining contours, such as core pullers or spraying robots, may cause turbulences. They strongly influence the quality of capturing.



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EXAMPLES OF IMPLEMENTED SYSTEMS



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