

■ Application: Hot galvanizing steel parts



■ The Task

During the process to hot galvanize steel parts, the parts being galvanized pass through a range of stages. After pre-treatment, the steel surface undergoes intensive cleaning in a flux bath to increase the reaction capacity of the steel with the liquid zinc. After this the parts are dried in a drying furnace and subsequently immersed in molten liquid zinc. The processing capacity equals approx. 6 tons of raw material at 5 - 6 immersions per hour. The operating temperature of the zinc bath is approx. 450° C.

During the immersion process the flux reacts with the liquid zinc. As a result it finish-cleans the steel surface and therefore supports the reaction. This generates emissions in gaseous and dust form comprising zinc oxides and other chlorides, which pass into the ambient air. These emissions must be extracted properly and reliably to protect the environment (according to TA Luft - Technical Instructions on Air Quality Control). The extraction systems used to date only managed to achieve this by using very high exhaust air volumes and a low capture degree. For the Otto Lehmann project in Neutraubling, the original air volume required for this purpose was approximately 80.000 m³/h.

In conjunction with the Amberg-Weiden Polytechnic, a flow simulation system was created which provided the design basis for the zinc bath housing. As a result of the well-known low residual dust concentrations of the Herding® sinter lamellar filters used, a part of the stream of clean gas can be returned to the working booth.

■ The Task

This improves the collection of the emissions whilst also reducing the volume of the extraction air. As a result of the size of the galvanizing bath with a surface of 22.5 m², which is also designed to fit large steel constructions, the challenge was to collect and extract the resultant emissions perfectly using a complete Herding® filter system.

■ The Solution

Herding® filter unit Type HSL 1500-96/18 GZP

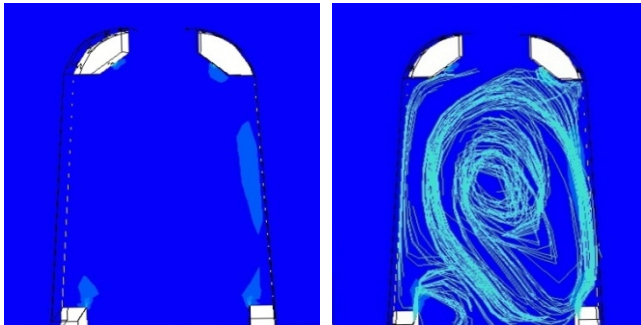
The exhaust air volume required was only **40.000 m³/h**

- ⇒ Reliable and economical separation of the fine dust by the Herding® sinter-lamellar filter
- ⇒ Very long service life of the filter medium due to consistent surface filtration
- ⇒ Residual dust concentration < 1mg/m³
- ⇒ Returning part of the clean gas stream to the working booth to maintain the temperature and ensure perfect collection of the emissions
- ⇒ Precoating of the filter elements
- ⇒ Dust discharge in a big-bag system using a rotary feeder
- ⇒ Cutting the originally required exhaust air volume by half!

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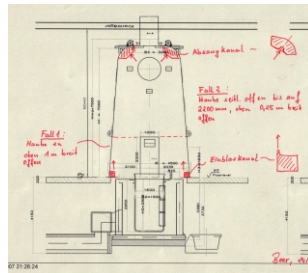
Flow simulation

Basis for designing the housing and calculating the exhaust air volume

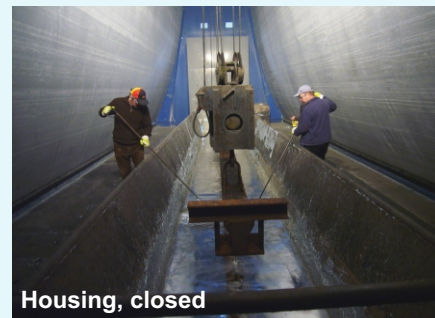


Velocity: Magnitude (m/s)
0.00000 5.6335 11.267 16.901 22.534 28.168

Design data for the housing



External view of the housing



Housing, closed



Flared collection openings



Herding® Filter System



Dust discharge from the Herding® filter plant in a big-bag-system



Awarding of the Herding® Environment Key

In February 2008, Otto Lehmann GmbH was awarded the **Herding® Environment Key**. This commendation goes to companies which, in particular measure, implement innovative, environment-friendly and sophisticated technical solutions in their production operations.

Picture: Mr. Haimerl, Managing Director of Otto Lehmann GmbH and Mr. Schimmelmann, Managing Director of Herding GmbH Filtertechnik, at the ceremony.

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