

FOOD

ENERGY EFFICIENT EXHAUST AIR PURIFICATION IN THE MEAT PROCESSING INDUSTRY



A breath of fresh air in foodstuff production – new energy efficient exhaust air purification saves energy and costs.

The burger production is an integral pillar of food manufacturer Hardy Remagen – production is now carried out more resource-efficient.

THE COMPANY

**ADDRESS**

Hardy Remagen
GmbH & Co. KG
An der Hasenkaule 9-13
50354 Hürth

INTERNET

www.hardy-remagen.com

ESTABLISHED

1718

LINE OF BUSINESS

Production of ham,
meat and sausages

EMPLOYEES

180

INITIAL SITUATION

Among other things, Hardy Remagen also produces burgers. The friers and exhaust air flow are severely contaminated with oil, grease, aerosols and odours. In addition to that, substantial amounts of organic carbon compounds caused by the heat treatment of the foodstuff are released. The high grease and oil contents in the exhaust air require the use of filter processes which can neither block nor stick and are able to remove a wide range of organic odour compounds.

The company sought new solutions for the treatment of friers and the exhaust air flow as a part of the re-planning process of the production facilities. The post-combustion which has been in use so far causes high energy consumption (approx. 20 – 30 m³ natural gas per 1,000 m³ process exhaust air) as well as substantial CO₂ and CO emissions. Hardy Remagen decided to use a new and innovative exhaust air purification system of the company KMA Umwelttechnik GmbH.

Saving resources. Strengthening the economy.

MEASURES AND ADVANTAGES

The use of the innovative hybrid exhaust air filter process is the first large-scale application in the burger production. In the course of this multi-stage process oil and grease aerosols are separated in the first filter stage (electro filtration). After that, the pre-cleaned exhaust gas is cooled by a heat exchanger and the extracted heat used to supply the operating premises with fresh air. In order to heat up the fresh air to the required temperature throughout the year without additional fuels, a heat pump is integrated between exhaust and supply air heat exchanger. As the exhaust air temperature is above 25°C throughout the year, the heating can be ensured without additional heaters running with fossil fuels, even on cold winter days. After passing the heat exchanger, the exhaust air enters the odour separator module. Here, the odour-carrying modules are irradiated by vacuum ultraviolet lamps at a wavelength of 185 nm. The irradiation triggers a chemical reaction which causes the long-chain intensively smelling molecules to oxidate and decay into short-chain molecules. During the automatic measurement of the energy demand, the energy data of the exhaust air plant (filter, ultraviolet light as well as supply and exhaust air fans), the air conditioning and the heat pump are listed up separately from each other. As a whole, a reduction of energy consumption of 5,015,977 kWh/a could be realized which corresponds to savings of approx. 97 percent. CO₂ emissions are reduced by almost 960 tons per year. It could



Irradiation with ultraviolet light neutralizes odours and ensures good air.

be proved that the combined exhaust air purification consisting of electric filter, ultraviolet treatment as well as heat recovery may provide a functional alternative even for those exhaust air flows which are severely contaminated and hard to clean, as opposed to the energy consuming thermal post-combustion.

RESOURCE EFFECTS

Electro static filters with ultraviolet light as opposed to thermal post-combustion	5,015,977 kWh/a
Reduction of CO ₂ emissions	957,3 t/a

THE WAY TO FINANCING

In September 2011 the company Hardy Remagen contacted the EFA's financial consulting upon the recommendation of the plant engineering firm. During the application stage, EFA assisted the company. After the KfW Bank's approval of the project in February 2012, EFA was assigned with the transaction of the grants, in June 2012 the

project was completed. The costs for the measure amounted to approx. € 388,000. The project was subsidized by the environmental innovation programme of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety with funding worth € 116,400.

The project partner

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