

August 14, 2014

# News Release

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## Test Facilities and Pilot Plant of RVT Process Equipment GmbH P1/14

- RVT is running different test facilities and pilot plants
- This includes test facilities on the manufacturing site Marktrodach, a mobile multi-purpose pilot plant, and a simulation model for fluid dynamics

RVT is running different test facilities, either for developing and improving its own products or to carry out test runs on behalf of customers order.

### **Test Facilities on the Manufacturing Site Marktrodach:**

For testing random and structured tower packing we are operating two columns with 450 and 600 mm diameter. Using the media water and air all the basic data for the hydraulic design of mass transfer columns can be determined.

Another three columns with diameters of 450, 600 and 2,000 mm are available for testing mass transfer trays. These columns are equipped with three trays each and a gas distributor device. Pressure drop, entrainment and weeping rate are the measured values while running the columns with water and air.

All these columns are made of transparent PVC for visual control of the mode of operation.

A further test bed is designed for test runs of liquid distributors. The measured parameters are the minimum and maximum liquid load, the

distribution of the water storage level and the uniformity of liquid distribution. This test bed is used as well as for the test of new designs and as for commissioning test runs together with customers personnel.

Maximum diameter of the distributor: 6,000 mm

Maximum liquid load: 1,200 m<sup>3</sup>/h max.

### **Mobile Multi-Purpose Pilot Plant:**

A mobile pilot plant can be used for test runs on customers' site. The complete unit is installed inside a 40' container and can be used for ammonia stripping from liquids but also as waste gas scrubbing plant separating contaminants from gas like SO<sub>2</sub>, HCl, HBr or HF.

This unit gives the opportunity to make test runs on customer's site under real conditions to get all the information necessary for engineering the follow-up plant in an industrial scale.

For the recovering of ammonia the plant is designed for a capacity of 1 m<sup>3</sup>/h of waste water. This medium is first heated up to 55 °C by a heat exchanger and alkalized to a pH-value of 12 by addition of sodium hydroxide. The stripping process is operated with vapor-saturated air to strip the ammonia from the liquid. The exhaust vapors leaving the stripping column are entering the absorption column working with a scrubbing solvent. The pH-value of this solvent is acidified to 2 by adding sulfuric acid. This acid is reacting to ammonia sulfate (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> inside the absorption column. Ammonia sulfate concentrated up to 38 % by volume is the liquid product of this process and is being discharged out of the process.

In addition to the ammonia stripping process it is also possible to operate the plant with the following operating modes:

Quenching/scrubbing:

cooling and saturation of hot flue gases (up to 500 °C)

followed by absorption of gaseous contaminants

**Waste gas scrubbing:**

absorption of gaseous contaminants or odorous substances,  
single or double-stage process  
chemically with acids or alkaline or  
physically by scrubbing with water.

The following inorganic contaminants can be separated:

- elementary halogens e. g. Cl<sub>2</sub>, Br<sub>2</sub>, J<sub>2</sub>
- hydrogen halides e. g. HCl, HBr, HJ and HF
- sulfur dioxide SO<sub>2</sub>
- further contaminants on request.

**Simulation model for fluid dynamics:**

The software tool ANSYS offers the possibility to optimize the design of column internals to enhance pressure drop and capacity by Computational Fluid Dynamics - CFD. The following illustrations show the fluid dynamics of a combi element before and after optimizing it.

**About RVT**

RVT Process Equipment GmbH is a medium sized family owned company located in Upper Franconia, Germany. Since 1976 our scope of supply has covered components for mass and heat transfer processes for chemical, petrochemical, refinery and environmental applications.

The overall array of products includes random packing, structured packing, column internals, mass transfer trays, complete columns and turnkey units for environment protection applications.

More than 140 employees work for the company in Steinwiesen and Marktrodach. Our two subsidiaries in Knoxville TN, USA, Kunshan PR China and representatives in all important market places are selling our products all over the world and are being used by many global players.

Further information on RVT is available on the internet at [www.rvtpe.com](http://www.rvtpe.com)

## Attachment



Tray column Ø 900 mm  
P114\_RVT\_TestFacilities\_pic1



Tray column equipped with tunnel trays in operation  
P114\_RVT\_TestFacilities\_pic2



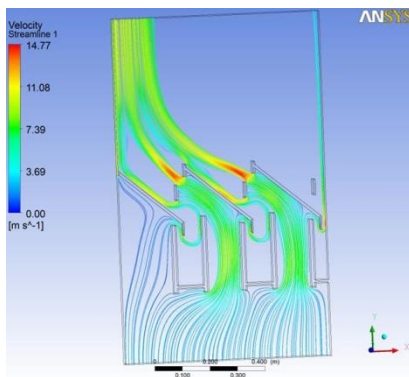
Tray column Ø 1,500 mm  
P114\_RVT\_TestFacilities\_pic3



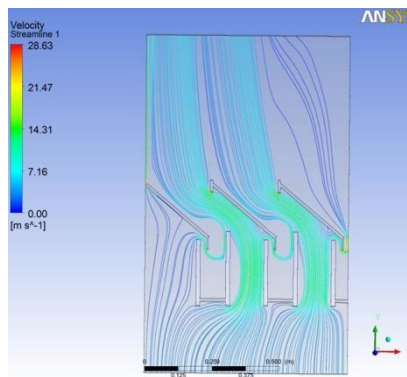
Test bed equipped with trough type distributor  
P114\_RVT\_TestFacilities\_pic4



Mobile multi-purpose plant for ammonia stripping and waste gas scrubbing ready for start-up with mounted columns for stripping and absorption  
P114\_RVT\_TestFacilities\_pic5



Distribution of gas velocity inside a combi element before optimization  
P114\_RVT\_TestFacilities\_pic6



Distribution of gas velocity after optimization  
P114\_RVT\_TestFacilities\_pic7