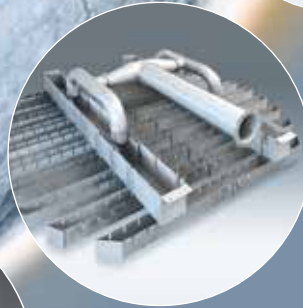




RVT Process Equipment –
serving the chemical and
petrochemical industry
globally



All you need
for mass transfer

Serving the chemical and petrochemical industry globally

RVT Process Equipment GmbH is a modern, mid-sized company supplying innovative products and services for chemical, petrochemical and environmental applications. In the past, both our operations and the framework in which we operate have changed again and again, but our determination to continuously develop has remained firm. Today, on the basis of these foundations, RVT is a powerful enterprise that provides its customers with solutions that are tailor-made to their needs.

RVT Process Equipment GmbH has a wide range of customers each with a multitude of requirements. They range from the provision of small quantities of packing for laboratory experiments, to the construction of complete, turnkey plants for environmental applications of industrial dimensions. However, regardless of the size of the order, we focus on meeting the customer's requirements.

Today, RVT Process Equipment GmbH employs around 130 people at the company's sites in Marktrodach in the region around Kronach / Bavaria.

The two subsidiaries in Knoxville / Tennessee / USA and Kunshan / China as well as our representations all over the world make sure we are never far from our customers. Modern production machinery, highly specialized CAD workstations and the ongoing further training of our staff ensure that our products are produced to a high quality standard.

Historical background

1898 – 1975 The beginnings of RVT go back to the year 1898. Paul Rauschert founded a factory for the production of electro-technical porcelain in Huettengrund / Thuringia. Thirty years later, it has developed into a producer of ceramic technical components, with 2,200 employees in several locations.

1976 – 1981 In 1976 the product range was extended to include plastic injection molding. This made it possible to produce ceramic and plastic parts in almost any shape and thus to produce packing for the chemical industry. In the years that followed, the production of ceramic and plastic random packing was extended with the foundation of the Process Engineering Division.

1982 – 2005 In 1982 the company introduces the specifically developed Hiflow Ring® on the market. The product features a high gas capacity combined with an extremely low pressure drop and a very low wall flow. In the years that followed, the range was extended to include even more products such as metal packing, column internals and mass transfer trays. The "packed column" was the key component that led to the establishment of the package unit division. 1987 the company strengthens its business in the United States and is founding a new regional office in Knoxville, TN.

As a logical result of this development in 1996, the Process Engineering Division was transformed into an independent company. In the same year the new facility in Marktrodach started production. Shortly after that, in 2005, the Rauschert Verfahrenstechnik GmbH was separated from the Rauschert Group and continued operations as part of the Kober Group, founded by Rainer Kober.

2006 – 2012 The founding of an independent subsidiary in Kunshan, China, which is responsible for regional sales and production, marks the company's leap into Asia. In 2008 the company changed its name from Rauschert Verfahrenstechnik GmbH to RVT Process Equipment GmbH. The product portfolio is further rounded off by the manufacturing of structured packings in the year 2010.

2013 – today The families Geipel and Rueger take over RVT Process Equipment GmbH. Throughout its history and to this day, RVT has remained a medium-sized family business that is conscious of its roots and its responsibility in the region. Long-term plans for company development therefore take precedence over short-term decisions. With the opening of an office in Frankfurt am Main the company gets closer to the customer and is represented in the center of Germany.

Our products – all you need for mass transfer

Mass transfer processes play an important role in the chemical and petro-chemical industry, in the oil and gas processing industry as well as in environmental technology. RVT supplies the necessary equipment for all of this:

- random and structured packings in almost all sizes, types and materials,
- The corresponding column internals,
- mass transfer trays,
- complete columns,
- package units for scrubbing exhaust gases or for the recovery of ammonia, plants for the treatment of waste water or residue incineration plants for the disposal of gaseous and liquid media as well as
- assembly and supervision of installation.

We produce tower packings, column internals and mass transfer trays in accordance with our strict quality

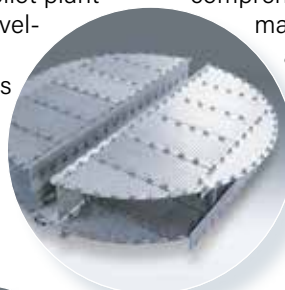
criteria at our sites in Marktrodach / Germany and Kunshan / China. Since 1996, RVT Process Equipment GmbH has been certified in accordance with the standard ISO 9001:2000 and since 2010 ISO 14001:2004.

We maintain a container-based pilot plant as well as test facilities for the development and performance testing of our liquid distributors and mass transfer trays. Our operational spectrum is rounded off by the continual development of our products to fit our customers requirements. Besides the construction of new plants,

we are specialized in the revamping and conversion of existing columns and plants as well.

RVT Process Equipment GmbH has grown to be the third-largest supplier of packings, column internals and trays in Europe. Our

comprehensive range of services makes us an experienced and competent partner for our customers for all of their mass transfer requirements.



Mass transfer trays



Column internals



Structured packings



Random tower packings for mass and heat transfer

Random and structured tower packings



Random tower packings

RVT's random tower packings are available in a multitude of geometrical configurations as well as materials and sizes for almost every application:

- Hiflow® rings
- Raflux rings (pall rings)
- RMSR (metallic saddle rings)
- saddles (plastics and ceramics)
- cylindrical rings and
- biological carriers.

Materials available:

Plastics

PP, PE, PPH, HDPE, PVC, C-PVC, PVDF, PFA

Metals

Carbon steel, stainless steel, hastelloy, titanium, nickel, copper, aluminium

Ceramics

Stoneware, alumina

Structured packings

RVT Process Equipment GmbH provides a broad range of innovative and conventional structured packings in both metallic and thermoplastic materials for different applications.

RMP and RMP S (RVT Metal Structured Packing)

are mainly used in processes with

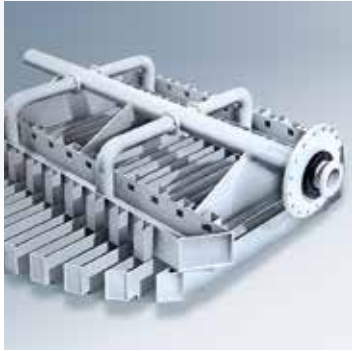
- low liquid flow rates
- high gas loads
- for low pressure drop requirement
- high demand of mass transfer units

These operating conditions are common in many vacuum distillation and rectification processes in the chemical and petrochemical industry.

Hiflow® PLUS is a product that combines the advantages of random tower packings and conventional structured packings while reducing the limitations of these two mass transfer components. This packing type – inspired by the Hiflow® random packing – is particularly suitable for applications that require high capacities at even greater liquid loads. Typical application fields are processes with large gas volumes e.g. CCS or SO₂ separation processes from flue gases by means of scrubbing. The main performance characteristics and advantages of Hiflow® PLUS are:

- lower pressure drop than that of random tower packings
- improved cross flow compared to conventional structured packings
- economic production due to reduced raw material requirement
- no redistribution (wall wiper) required
- easy installation





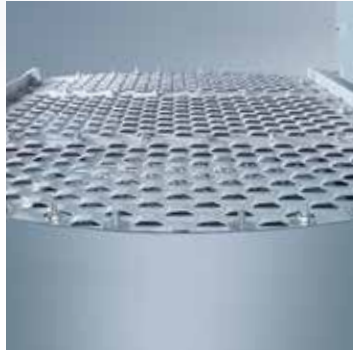
Column internals

Mass transfer performances as well as the hydraulic characteristics of a packed column are substantially determined by the quality of the column internals used. The optimal adaption of the internals to the selected tower packings as well as to the individual operating conditions and material requirements require comprehensive process engineering know-how and experience.

RVT Process Equipment is your competent and reliable partner in terms of the following items:

- liquid distributors
- collecting trays
- liquid feed systems
- bed supports and limiters
- mist eliminators
- gas distributors
- custom made internals for special applications

All these components are manufactured either in plastics or metals in our own factory. On demand we manufacture special materials like PTFE, TFM, CFC, titanium, tantalum.



Mass transfer trays

We offer mass transfer trays in versatile designs and materials for almost all applications including the hydraulic design.

RVT Process Equipment GmbH supplies valve, sieve and dual-flow trays, bubble cap trays, tunnel trays and also special tray constructions (cascade- or chimney trays, shower decks and trays for foaming systems).

Beside metals also thermoplastic materials can be used (PPH, PE, PVC, PVC-C, PVDF, PTFE, TFM).



Package units

Based on the scope of supply of mass transfer equipment, the know-how and many years' experience, RVT Process Equipment delivers plants for some specific applications: especially

- cleaning of flue gases and process gases,
- the removal of ammonia and other volatile components from waste water by stripping processes,
- the combustion of gaseous and liquid residues and
- plants for the separation of substances by thermal
- separation processes.

Our scope of supply includes

- basic and detailed engineering,
- provision of all the necessary plant components,
- erection and assembly,
- commissioning and start up,
- service and maintenance.



Biological carrier media

An effective waste water treatment facility is an essential premise for ensuring a clean environment. One of the main process steps in a waste water treatment plant involves the degradation of organics by microorganisms.

RVT Process Equipment is delivering the optimum carriers for this application. The scope of supply includes the carriers for submerged beds and trickling filters RFK and the carriers Bioflow for MBBR (Moving Bed Biofilm Reactors).

Our operational field

The world of industrial processing

The applications of our products are as varied as the products themselves. Our customers include both plant operators in the fields of chemicals, petrochemicals and refineries as well as general contractors who supply those sectors with complete production plants.

Besides supplying standard materials, we are specialised in processing exotic plastics and metals in order to supply products suitable for a large range of applications. RVT has particularly extensive references and experience in the following fields of operation, to name but a few:

- Ethylene / Olefin plants
Oil and water quench columns, Alkali scrubber, de-methaniser, de-ethaniser, de-propaniser and de-butaniser, C2 and C3 splitter
- Fertiliser factories (ammonia and urea plants), CO₂ scrubbers and regenerators (MEA / DEA, Benfield), Flash vessels
- LNG plants
MEG stripper, MEG / CO₂ absorber, CO₂ stripper, de-methaniser, de-ethaniser, de-propaniser, HHC stripper

- Methanol plants
- Air separation plants DCAC, chillers
- Chlorine-alkali plants, VC / PVC production
- Flue gas scrubbers for domestic waste incineration, hazardous waste incineration, sewage sludge incineration, residue incineration in the chemical industry
- Incineration plants for gaseous and liquid media such as extracted air (with the exception of regenerative systems), exhaust (inert, with a high heating value or ignitable), liquids (waste water, residue, solvents)
- Strippers for ammonia, VOC, CO₂, drinking-water treatment
- Oil and gas industry – inert ceramic spheres as a catalyst carriers

We have very probably also supplied mass transfer products for your field of operations. Over 35 years of experience in working with our customers enable us to provide a range of high-performance products and services for numerous fields of operation.





RVT Process Equipment

Your competent partner – globally



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