PUMPS FOR MOLTEN SULPHUR

THE RIGHT SOLUTION. FOR ANY FLUID.
RHEINHÜTTE PUMPEN
THE RIGHT SOLUTION
FOR MOLTEN SULPHUR
APPLICATION

Rheinhütte Pumpen can provide the right solution for your molten sulphur application. Experience gained over decades in pumping sulphur and sulphuric acid means that we can supply you with both vertical and horizontal pumps for sulphur degassing, sulphur charging, sulphur granulation and sulphuric acid production.

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RHEINHÜTTE PUMPEN
If you want to solve demanding pumping tasks in the chemical industry efficiently, permanently and economically, you need more than just a coherent technical concept. Experience of application, material knowledge and dialogue with you ultimately lead to the optimum solution. A way which Rheinhütte Pumpen has been following for over 150 years.

Cover picture and picture on page 3:
With the kind permission of Sandvic Process Systems
SPECIAL PUMPS FOR MOLTEN SULPHUR

Our customers in the area of molten sulphur include refineries, tank farms and transporters and manufacturers of sulphuric acid all around the world.

Our molten sulphur pumps meet the highest of requirements. They are used in the following applications:
- Sulphur degassing
- Sulphur charging
- Sulphur granulation/pelletising
- Sulphuric acid production

As an expert for the pumping of molten sulphur, we do not simply regard ourselves as pump manufacturers, but distinguish ourselves far beyond this as a solution provider. We cooperate with our customers to develop an ideal strategy which can be implemented in a constructive manner to meet all requirements. We also develop individual solutions to meet unusual requests and address special problems.

When it comes to pumping molten sulphur, we focus in particular on plant conditions (e.g. whether pumping is realised via a bypass). We offer flexible installation lengths and alternative designs for all vertical submersible pumps, along with reliable sealing variants which go far beyond mechanical seals.

We approach our customers’ design criteria in a flexible manner and, in addition to the actual manufacture of pumps, provide a broad range of services, from pressure testing to test bench trials and also including PMI tests and dye penetration testing. It goes without saying that each of our customers receives comprehensive documentation of his project.
GVSO – YOUR ADVANTAGES AT A GLANCE

INDIVIDUAL
Multi-stage, radial hydraulic designs and segment designs which are dependent on the immersion depth cover a wide operational spectrum and make it possible to produce customised pump solutions, flexibly adapted to your own individual needs.

EFFICIENT
The compact construction is also outstandingly suited to very small container openings. Thanks to the high-mounted, grease-lubricated roller bearing system above the mounting flange, applications even in the high-temperature range can be implemented in an easy and user-friendly way. The casing design allows minimum pressure losses and thus operates in a highly efficient way. The ease of fitting and removal of the pump thanks to extended pipeline connections outside of the sole plate area saves time – as does the exchange of roller bearings which can be done with the pump in the fitted state. The thermally optimised pump design offers low heat loss to surroundings.

ROBUST
Closed radial hydraulics with double volute casings minimise the radial forces that occur. The separation of the pressure and shaft guide tube enables optimum lubrication of the sleeve bearings and guarantees uniform thermal expansion of the medium in the casing. In addition, defined shaft connections which are independent of the direction of rotation allow pipes to be emptied and the pumping medium to flow back when the pump is switched off without any additional forced cooling.

RELIABLE
Shaft sealing concepts which do not involve any contact with the medium and the self-emptying design increases the level of reliability. The unique sleeve bearing principle allows defined forced lubrication by the pumping medium (outside lubrication also possible) and thus ensures a low level of slide bearing wear during constant pump operation. Costly oil lubrications or additional cooling which have an impact on safety are not necessary. The pump is fitted with a heating jacket to maintain the pumped sulphur at a constant temperature and, consequently, unchanged viscosity. Each individual segment of the pipe string is encased in its own heating jacket in this respect.
Pumptype VS 4 according to API 610, 11th edition, ISO 13709-2009

GVSÖ – Flexibly used for Molten Sulphur

The sophisticated pump design provides users and designers flexibility and security. 28 different pump sizes offer maximum freedom when it comes to the choice of hydraulics. With its special design and innovative details the heated version of our vertical GVSÖ has always persuaded users through their long-term availability, corrosion resistance, high reliability and quality.

Sizes | 28 different pump sizes
---|---
Materials | Carbon Steel (1.0619), Stainless steel (1.4408)
Seals | Stuffing-box packing

Technical Data

| DN | 40 to 450 |
| PN | up to 25 bar |
| Q | max. 3,000 m³/h (13,200 gpm) |
| H | max 125 m (410 ft) |
RCE – YOUR ADVANTAGES
AT A GLANCE

ROBUST
The special design and the pump material which is individually customized for the pumping medium provide protection from wear and tear. Special hydraulics make it possible to pump fluids with solids fractions of up to 35% and increase the efficiency of the sealing concepts. The robust bearing pedestal and the reinforced shaft system guarantee quiet running with a low amount of vibration at up to 3500 rpm.

DURABLE
The generous dimensioning enables steady, low-maintenance operation with constant levels of pumping performance over many years.

EFFICIENT
Optimum flow rates and flow guidance arrangements are specially designed for pumping aggressive and abrasive liquids. This allows a longer life with the best level of efficiency.

FLEXIBLE
Depending on the particular application, pump components made from different materials can be combined and are easy to exchange. This means that the pump can be adapted optimally to extreme operating conditions.

INDIVIDUAL
Complete pump units with all of the necessary supply components are tailored to specific customer requirements. The comprehensive heating chamber system (RCE DWH) also surrounds the sealing area. That ensures that no sulphur residue solidifies and forms deposits in the shaft seal chamber during pump start-up and shutdown.
Heated design with hydrodynamic shaft sealing and ring valve (RCE DWH)

Heated design with mechanical sealing API Plan 62 (RCE C1QH)

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**RCE – The Robust Pump**

Thanks to its design and **extremely robust construction**, the RCE is ideally suitable for pumping molten sulphur. For example, this heavy duty pump demonstrates a particularly **high level of flexibility** with regard to optimum adaption to existing conditions, as a wide range of materials and **more than 40 pump sizes** are available.

<table>
<thead>
<tr>
<th>Sizes</th>
<th>40 different pump sizes</th>
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<tbody>
<tr>
<td>Materials</td>
<td>Cast steel (1.0619), Stainless Steel (1.4408)</td>
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<tr>
<td>Seals</td>
<td>Hydrodynamic shaft seal, Single or double acting mechanical seal</td>
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<tr>
<td>Options</td>
<td>Cantilever-Design (RCEV)</td>
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**Technical Data**

<table>
<thead>
<tr>
<th>DN</th>
<th>32 to 300</th>
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<tr>
<td>PN</td>
<td>up to 64 bar</td>
</tr>
<tr>
<td>Q</td>
<td>max. 1,000 m³/h (4,400 gpm)</td>
</tr>
<tr>
<td>H</td>
<td>max. 180 m (590 ft)</td>
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</tbody>
</table>
RMKN – YOUR ADVANTAGES AT A GLANCE

SAFE
No leakage, thanks to the magnetic coupling and, consequently, hermetic sealing.

EFFICIENT
Service and maintenance-friendly machine concept with simple dismantling and inspection options. Cost-efficient operation and, overall, low life cycle costs.

RELIABLE
Heated chambers for casing, casing drains system, bearing bracket and magnet chamber prevent solidification of sulphur. The RMKN meets all the requirements of DIN EN 22858 in this respect.
RMKN – The Sealless Magnetic Drive Pump

The **heated version** of the RMKN is particularly suitable for sulphur processing where pure sulphur is involved and also in processes where pump usage is intermittent. The reliable magnetic drive concept, which is proven its worth over many decades, ensures **maximum reliability** in demanding industrial applications. Energy-saving spacer cans and a large selection of pump sizes make it possible to produce cost-effective and reliable facilities.

**Sizes**
- 30 different pump sizes

**Materials**
- Stainless steel (1.4408)

**Options**
- Close-coupled design
- Ceramic spacer can
- Temperature transmitter

**Technical Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>DN</td>
<td>32 to 150</td>
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<tr>
<td>PN</td>
<td>16 bar</td>
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<tr>
<td>Q</td>
<td>max. 400 m³/h (1,761 gpm)</td>
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<tr>
<td>H</td>
<td>max. 150 m (492 ft)</td>
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OUR SERVICES AT A GLANCE

PUMP DESIGN
The success of an installation starts with selecting the right pump. The type, size and seal must satisfy the requirements presented by the pumped medium. Thanks to modern, computer-optimised hydraulics, Rheinhütte pumps are ideally suited to meet any applications.

MATERIAL ADVICE
Which materials are best suited to your particular application? Whether you require pump materials, seal materials or changes in process affecting the pumps – our material specialists will offer you an individual recommendation, with full commitment.

OPERATING CONCEPT
Whether you want to monitor centrifugal pumps or operate complex vacuum installations, we will work with you to devise the right operating concept which meets your needs – from manual to fully automatic.

DOCUMENTATION
You need specific documentation? Whether standard or project – according to your requirements we create your individual project documentation.

INDIVIDUAL APPROVAL
All Rheinhütte centrifugal and vacuum pumps as well as Rheinhütte vacuum compact installations are tested at our factory before they are delivered: Together with our customers, specific details, processes and basic principles are tested and discussed.

ON-SITE SUPPORT
Whether it is for initial start-up or for training your personnel – our engineers are also available to assist you on site.

We offer the right solution for your project.
SUCCESS IS BORN OF EXPERIENCE

150 YEARS OF RHEINHÜTTE PUMPEN

As pump manufacturers to the world, Rheinhütte Pumpen is your expert for demanding pump applications – and has been for over 150 years. Our experience for designing pumps for conveying abrasive, corrosive and toxic media, our product innovations and the supreme product quality have made Rheinhütte Pumpen a proven component of many major plants – all over the world.

YOUR INDIVIDUAL REQUIREMENTS ARE OUR BENCHMARK

Our customers benefit from our customized advisory services on materials, sealing systems and maintenance concepts. Experienced project teams will draw up individualized documentation in line with your requirements. Our customers specifications are what counts for us and are integrated in our Quality Management systems, testing processes and the official approval procedure for pumps and installations.

YOUR RELIABLE PARTNER FOR PUMPS IN MOLTEN SULPHUR APPLICATIONS

For over 60 years now we have been developing and fabricating vertical and horizontal pump designs for molten sulphur industry. Moreover, we have gained extensive experience in the manufacture of vertical pumps up to and exceeding 17 metres in length. One of them has reliably pumped hot molten sulphur for several years in the charging terminal of a sulphuric acid plant in Sweden.

Our pumps have provided reliable service for many years in numerous major plants. We are, consequently, listed as a certified manufacturer by the largest refineries in the world. Furthermore, we successfully work together with notable plant constructors such as Petrofac, Daelim, GS Engineering, Hyundai, Chiyoda, JGC, Technip and many more. We are the market leader with our molten sulphur pumps in the Middle East region.

With our customised solutions for pumping molten sulphur in particular, the extensive documentation requirements and testing of the pumps, we along with our customers are constantly setting new benchmarks.

RHEINHÜTTE PUMPEN – your specialist for sophisticated pumping applications