



Chemical Industry

SWISS ENGINEERED PUMPS SINCE 1947

Challenges in chemical systems

In the chemical industry, pumping of media is particularly challenging. Temperatures and pressures, abrasion and corrosive media, as well as safety aspects all define the specifications for the pumps used. Egger has been working in this industrial environment since 1947 and its engineers have a great deal of practical technical experience – particularly in the chemical industry.

Gentle handling of media

Gentle pumping of challenging media

When pumping salt crystals, plastic granules, bacteria, metal catalysts and nitrocellulose, pumps require special properties.

Unique suitability of Egger vortex pumps

As a pioneer of vortex pumps, Egger has extensive experience in the gentle conveying of challenging media. Because the impeller is retracted in the pump housing, only 15 % of the material conveyed comes into contact with the impeller. This is why the Turo® vortex pumps T distinguish themselves by a particularly gentle transfer of shear-sensitive material. Moreover, since Turo® vortex pumps T have no seal gaps, the shearing force is eliminated at this point.



Improved service life times

Challenging media in the chemical industry

In the chemical industry, the media which needs to be conveyed can cause problems and shorten service life times due to their abrasive and corrosive properties.

Hydraulics and choice of materials solve many problems

The continuous development of vortex pumps is leading to an optimisation of the hydraulic efficiency while minimising the dwell time of the medium in the housing. Our Turo® vortex pumps with an integrated and patented axial spiral achieve long service life times, especially when conveying abrasive liquids. In conjunction with our highly wear-resistant, chromium, white cast iron housing used for example to convey lime water, vacuum residues, metal slurries, salt mush or SiC slurry, considerably longer service life times can be achieved.

Avoiding clogging

Media with solids or media that carry the risk of clogging

Polymerisations, rubber applications, coating dispersions and other chemical processes carry the risk of clogging. Solids can also enter the conveyed material in water treatment systems or cause clogging as a result of the flaking of container walls.

Free sphere passage to avoid disruptions

Thanks to the clog-free Turo® vortex pumps T, there is no need for costly and error-prone filter technology. The free sphere passage in the nominal diameter of the pressure nozzle enables even stones, branches, cable ties, screws and other solids to be conveyed. This series is ideal for use as tank-pit pumps or sloop pumps.



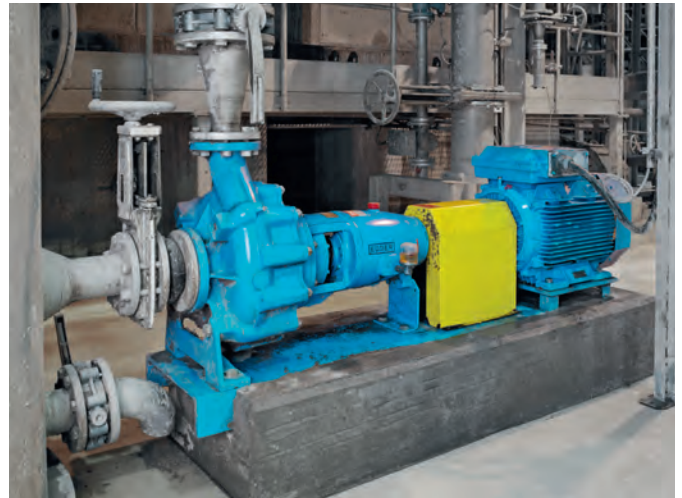
Sophisticated filter feeding

Specific requirements for feeding pumps

To achieve optimal filter results, pumps must be used that do not shear or grind the filter material. In particular the feeding of the chamber filter presses is very demanding.

Good results thanks to our pumps

At the beginning of the filtration process, the filter cloth must be supplied with a large amount of transfer medium at a low pressure so as to create as homogeneous a filter cake as possible. At the same time, the pump must generate high pressures at low delivery rates at the end of the filtration cycle. Due to their hydraulic operating principle, our Turo® vortex pumps are capable of reliably mastering this challenge and contribute to an optimal filtration result.



Mastering reactor loops

Reaction between gas and liquid phase

In recent years, batch stirred reactors have been replaced in many processes by loop reactors with external heat exchangers. Apart from the enormous increase in efficiency, continuous processes are now also possible. These are normally exothermic processes during which the chemical reaction takes place between the gas and liquid phase. To start the reaction, metal catalysts are sometimes used.

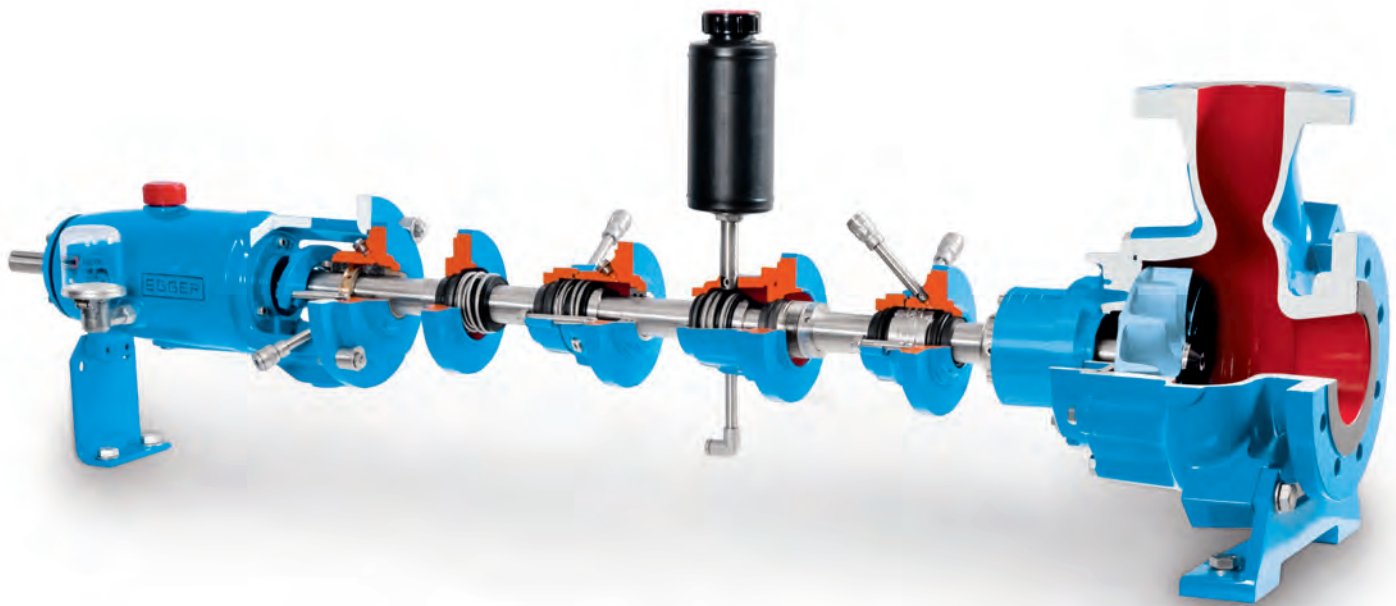
The pump for multiphase mixtures

Polymerisation, hydrogenation, ethoxylation, esterification, fatty acids and fatty alcohols or (P)MMA are only a few processes in which Egger reactor pumps are used. These active mixtures normally consist of the three phases liquid, solid and gaseous. The gaseous phase can be up to 25 vol %. The Egger reactor pump HT/HPT conveys such multiphase mixtures at temperatures up to 280 °C and pressures up to 100 bar. The delivery of boiling liquids at low intakes is another strength of Egger reactor pumps. NPSH_R values below 1.0 m are possible.

Individual pump configuration

Egger adjusts the pumps according to the individual customer requirements. This includes heating and cooling jackets on the suction and sealing side, base plates with spring elements to accommodate the thermal expansion or triple mechanical seals. From a mechanical perspective, the pump unit corresponds to the basic version of the latest API 610 release.





Sealing tasks in chemical pumps

Where traditional seals are stretched to their limits

Latex, crumb rubber, paints, saline suspensions, SiC slurry, tar oils, etc. are only a few examples of demanding sealing tasks. Here traditional shaft seals are stretched to their limits such as stuffing box packing or mechanical seals. Even hermetically sealed pumps with magnetic coupling or canned motors are only partly suitable for this.

Varioseal® – an Egger patent guarantees tightness

For these kind of challengers, Egger has developed the flexible shaft sealing system Varioseal® that enables different shaft seal types to be adjusted without having to modify the main pump components. Apart from the conventional stuffing box and mechanical seal requirements, a hydrodynamic shaft seal of the type Eurodyn® is integrated in the Varioseal® system. This 4-stage cartridge design is operated contactlessly and can thus be operated with no lubrication at all. Several types of stationary seals ensure long service life even in the case of intermittent operation.

For challenges at the limits

For heavy-duty applications we use our reinforced bearing block LB+ that increases the service life due to its minimal shaft displacement. This bearing block meets the mechanical requirements of the current version of API, standard 610.

Sealless pumps

The best shaft sealing is the type that is not required. With its cantilever pumps, Egger makes a significant contribution to interruption-free operation. This design operates without a shaft seal and without bearings in the area of the medium to be conveyed. They thus eliminate the main cause of failure. At the same time this pump is almost maintenance-free and dry-run safe for an almost unlimited time. The application range is huge and ranges from simple basement drainage to demanding process pump applications up to 400°C. Even gas-tight versions compliant with the German Clean Air Act with dry-running double mechanical seals are being used successfully.

An overview of the Varioseal® seals based on the Egger modular system can be found on our website: www.eggerpumps.com



Pit drainage, sump pumps

The challenge for increased solid content and high temperatures

Submerged sump pumps used in tank pits, waste-water pits or sump tanks, must meet special requirements due to the high proportion of solids and high temperatures.

Optimal applications for Egger submerged sump pumps

Since the shaft seal is located directly behind the impeller, the radial bearings do not come in contact with the medium to be conveyed. Different shaft seals allow a wide range of applications from dry-run safe versions to gas-tight-applications compliant with the German Clean Air Act. Furthermore, we manufacture submerged sump pumps with up to ten-metre long exposed shafts.



Submerged sump pumps for explosion-risk zones

Use in explosion-endangered zones

For the use of submerged sump pumps in explosion-risk zones, requires appropriate technologies and experience.

Egger submerged sump pumps are designed for explosion-endangered zones

These submerged sump pumps can be used in all explosion-endangered zones. Together with PTB in Braunschweig, Egger has developed a safety concept specifically designed for Zone 0 explosion risks. It enables applications to be used in Zone 0 with medium temperatures up to 150 °C. Since 2000, Egger owns a valid Type Examination certificate and can rely on many years of experience in the use of submerged sump pumps in Zone 0 explosion-risk environments.



Submerged sump pumps for high temperatures

We know the challenge

Molten salt for heat transfer, hardening salt, aetznatron, liquid sulphur or hot slop must be pumped at temperatures between 150 and 450 °C. These partly sluggish liquids are usually pumped from pressure-free containers. The temperature, pour point, solid matter, corrosive attack or high vapour pressures normally require sealless submerged sump pumps with customised design details. For safety reasons, a dry-installed pump is not recommended and problematic due to the sealing of the shaft.

Egger's high pressure and temperature series is the solution

Egger has developed a special high temperature series for these kinds of applications. Depending on the application, the cantilever design (without bearing and without shaft sealing) or the high temperature submerged sump pump are used. In the case of granulate media, the temperature of both types can be adjusted.

An overview of the installation set-ups and designs can be found at: www.eggerpumps.com

Large flow capacities

Elbow pumps RPP / RPG

For large flow capacities and low pressure heads, axial-flow impellers are used. Egger elbow pumps have been used with great success in crystallisation systems for more than 60 years. This pump has long overlapping vanes that allow very gentle pumping at minimum recirculation. The almost gap-free design with no bearings in the area of the liquid being conveyed, offers only minimal opportunity for corrosion. Depending on the requirement, these pumps can be manufactured in all available metal materials. A suspended version without mounting to a foundation avoids the use of compensators. Various special applications in the form of heated versions, process design or temperatures up to 260 °C are already in use.



Coal gasification and liquefaction

Special application on the basis of reactor pump HT / HPT

These pumps have proven themselves as wash-cooler recirculation pumps used in coal gasification and coal liquefaction processes. The FCC-column floor drainage circulation pumps also fit into this typical range of applications: In addition to the high temperature and high pressures in such applications, the problem of abrasion must be mastered. In order to come up with the optimum solution for the customer, it may be necessary to modify the hydraulic system and materials and maybe even the construction. In these cases our engineering team comes up with special customer-specific solutions.



Pilot systems

Reactor pump HT/HPT or pilot pump S

To validate new processes for commercial systems, the processes are first tested in pilot systems. Often the delivery rates are low, ranging between 0.5 to 5 m³/h, and cannot be realised with an Egger reactor pump. For this reason, Egger has developed a pilot pump S that meets all requirements for commercial process pumps. This series has been designed for boundary conditions of 25 vol % gas fraction, 100 bar system pressure and a temperature of 280 °C.

Peripheral applications

Waste-water/slop, tank pits, cooling water and purification plants

Thanks to its long experience in the chemical and other industries, and also because of the company's wide range of standard products, Egger is able to develop solutions that go beyond the actual processes. Egger pumps ensure the drainage of tank pits or pump process waste-water from depths of up to ten metres into a central treatment plants without causing clogging. Egger pumps also convey abrasive river water safely and reliably for cooling water applications.

The right material provides for the right solution

Customer- and application-specific choice of materials

Egger manufactures pumps in all castable metal materials. Egger mounts the standard materials such as cast iron, cast stainless steel, duplex and chilled cast iron (hardness of 55–60HRC) on large cast bearings. Special materials such as Hastelloy, Inconel, nickel, Monel, titanium or zirconium are available upon request.

An overview of the special pumps and materials can be found at:
www.eggerpumps.com



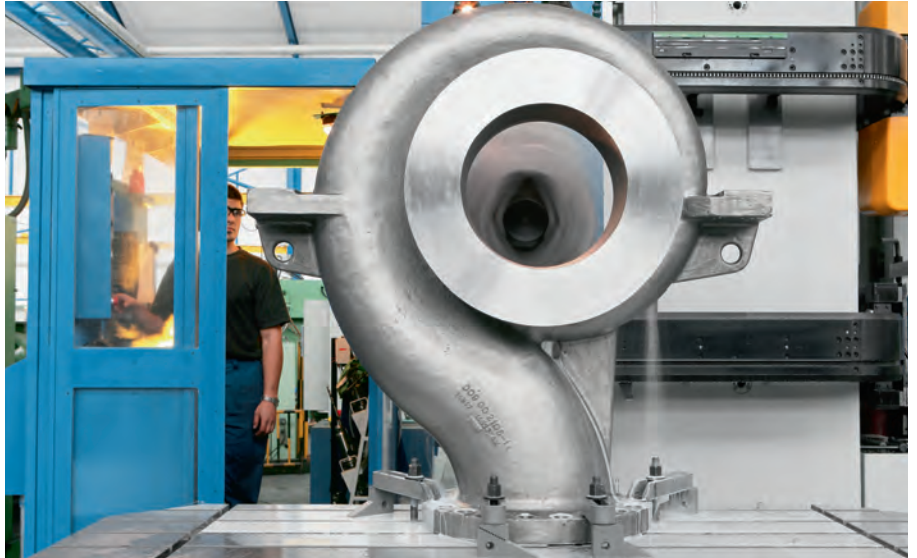
Emile Egger & Cie SA

Egger is a medium-sized independent Swiss company with offices in many countries. A key quality feature is that the whole production process – from development through to functional testing – is carried out in-house under controlled conditions. 350 skilled employees represent the professional expertise of Emile Egger & Cie SA.



Gradual development and internationalisation

Over the past 65 years, the company has developed from small beginnings to become a major manufacturer in the Swiss machine industry. As a result of careful expansion, the company has been able to preserve its independence and to this day remains a family business. We strive to stay close to our customers and, over the years, we have established subsidiaries in ten European countries, in Asia and in North America. A network of trading partners complements our presence.



A corporate culture of ethical and social responsibility

Profit maximisation has never been central to the company's considerations and the attitude of the family owner is to a much greater extent characterised by a sense of responsibility as one of the largest employers and training operations in the Canton of Neuchâtel, Switzerland.

Focus on challenging media

A key focus of the company's operations to date has been to be at the forefront of the development and production of vortex pumps and process pumps for gas and solids-laden media. Other hydraulic solutions have also been produced for decades, including propeller pumps and special pumps for use in demanding environments as well as diaphragm control valves.

Quality pumps last longest!

Parts and components undergo strict controls in the manufacturing process and the fully assembled pumps are also subjected to real operating conditions in our test area. The pumps have to show that they can operate with various technical parameters using water as the test medium. Egger tests its

pumps in accordance with tolerances and procedures specified in internationally recognised standards and industry standards.



The environment is our priority

The production of Egger pumps takes place in pristine surroundings on Lake Neuchâtel. Contributing to the preservation of this remaining natural habitat is an important concern of the company.

From design to commissioning

Emile Egger & Cie SA was established in 1947 and, to date, it has remained a privately owned and independent company. Swiss quality thinking shapes our work.

Engineering and design

Each pump is unique and is manufactured to customer specifications. We use computational tools and validated flow simulation programmes for the design of your pump. What is more, the casting mould is manufactured in our workshops by our own highly specialised professionals!

One-stop shop

The whole chain of production is handled by some 220 specialists in our own planning and production workshops. This workflow ensures a high production rate and quality that meets international standards.

Service

On request, we can carry out installation and commissioning throughout the world. With our after sales service, we are always there for you during the warranty and beyond. Egger has always invested in the longevity of its products. With a well-stocked spare parts store, we are at your disposal anywhere in the world to take care of your pump problems.



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