

The logo for EGGER, featuring the word "EGGER" in a bold, blue, sans-serif font, enclosed within a blue rectangular border.

**EGGER**

A large, light blue wireframe graphic on the left side of the page, resembling a stylized, curved structure like a fan or a turbine component, set against a solid blue background.

# Pumps and valves

SWISS ENGINEERED PUMPS SINCE 1947



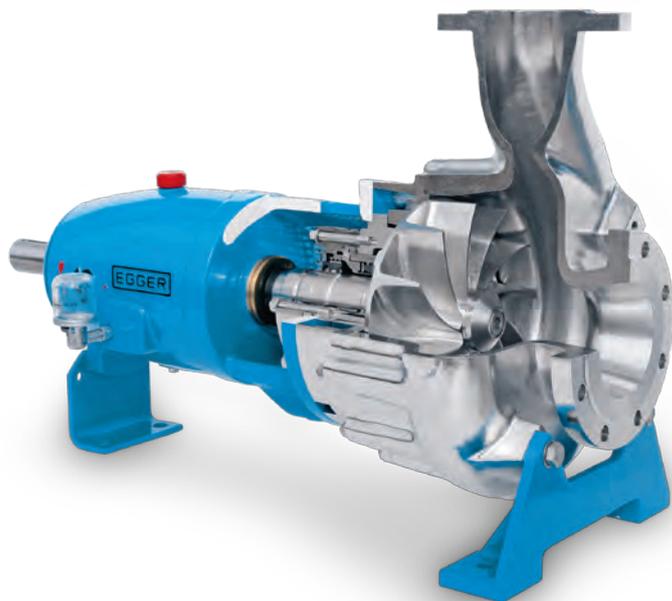
Pump room in wastewater treatment plant Werdhölzli at Zürich, Switzerland

## Pumps and valves

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# Turo® Vortex Pumps T

**Turo® Vortex Pumps with a completely open spherical channel. Only 15% of the pumped fluid comes into contact with the impeller. Around the world, thousands of pumps have proven themselves with decades of excellent service.**



## Applications

- Chemical and crystalline suspensions
- Numerous abrasive and corrosive fluids
- All viscous materials
- High concentrations of fibrous suspensions
- Municipal and industrial wastewater
- Every kind of sludge

## Features

- Gentle pumping of sensitive liquids, such as salt crystal
- Special volute casing, tuned to the hydraulics

## Facts & Figures

Dimensions: DN 32–200 mm

1¼–8"

Flow rate: up to 140 l/s

2220 US gpm

Diff. head: up to 140 m,

460 ft

Pressure: up to 30 bar,

440 psi

Temperature: up to 180°C/355°F

## Reference industries and fluids

The Egger Turo® Vortex Pumps have the capability to handle challenging liquids gently and without any risk of clogging.

Below is a selection of industry sectors in which Egger pumps have proven themselves over a long time:

- Chemical industry
- Petrochemical industry
- Waste water treatment
- Automotive industry
- Building industry
- Mining industry
- Paint and varnish industry
- Rubber industry
- Power industry
- Food industry
- Paper and cellulose industry
- Shipbuilding
- Solar industry
- Steel industry
- Textile and fiber industry
- Sugar industry

## Hydraulics for Turo® Vortex Pumps T

The vortex impeller is an «open» impeller whereby power transfer to the fluid being transported is comparable to the principle of a hydraulic coupling. It is fundamentally different from classic non-clog impellers. Egger, known as the pioneer in vortex impeller development, has been rigorously optimising their special hydraulic properties to the present day. Various impeller variations have resulted from this, offering optimal conditions for each application.

### Insensitivity to abrasion – gentle transport

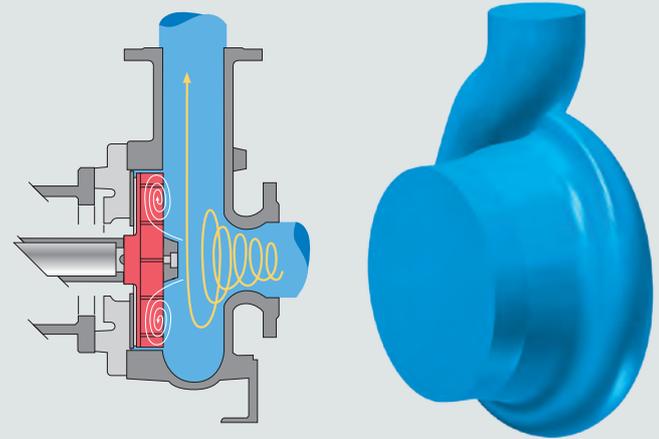
As a result of the Turo® System, the major proportion (85%) of the fluid being pumped is transported directly from the primary vortex to the pressure connection. Only 15% of the fluid being pumped comes in contact with the impeller through the secondary vortex. Sealing gaps which could wear during solids handling and cause grinding effects are not present in our construction. That reduces the abrasive attack to a minimum and sensitive structures in the material to be conveyed such as crystals or bacterial flakes/algae remain largely unaffected. Any potential wear on the impeller always develops symmetrically; that is, the balance and thus the quiet operation of the pump remain assured. The output will only drop significantly with an almost completely abraded impeller.

### Higher, longer-lasting efficiency through optimal flow geometries

One component of the Turo® System is the patented axial volute in the casing. In other words, Egger specially applies coordinated casing geometries to the vortex impeller. This combination which delivers high discharge heads and efficiency is a unique property of the Egger Turo® Pump.



Non-clogging, safe delivery rate due to the recessed impeller and a patented axial spiral



Totally recessed impeller

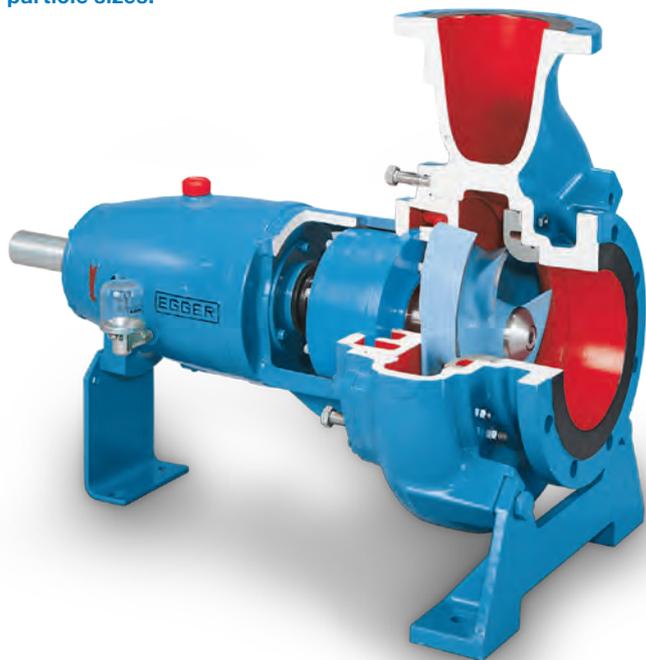
Patented axial spiral

### Turo® TA impeller for raw waste water

Special impeller for pumping raw sewage in municipalities with high levels of textiles that tend to wrap around the blades. Fully integrated into our Turo® vortex pump's modular system, the impeller is hydraulically optimised for this requirement.

# Process Pumps EO/EOS

The high-performance pump for homogeneous liquids containing high concentrations of solids and high gas content. Different numbers of impeller blades for large and small particle sizes.



## Applications

- Demanding fluids in the chemical and petrochemical industries
- Multiphase mixtures for reactor loops
- Aerated fibre suspensions in the pulp and paper industry
- Wastewater and aggressive fluids in wastewater technology
- Sludges
- Numerous abrasive and corrosive fluids

## Features

- Pumping of fluids with gas contents up to 25% vol.
- Semi-open impeller
- Different numbers of blades

## Facts & Figures

Dimensions: DN 50–500 mm  
2–20"

Flow rate: up to 1500 l/s  
23800 US gpm

Diff. head: up to 150 m,  
492 ft

Pressure: up to 30 bar,  
440 psi

Temperature: up to 180°C/365°F

## Reference industries and fluids

The Egger Process Pumps EO/EOS have the capability to handle challenging liquids containing gas and solids.

Below is a selection of industry sectors in which Egger pumps have proven themselves over a long time:

- Chemical industry
- Petrochemical industry
- Waste water treatment
- Steel industry
- Power industry
- Sugar industry
- Automotive industry
- Paint and varnish industry
- Rubber industry
- Solar industry
- Textile and fiber industry
- Paper and cellulose industry
- Food industry
- Building industry
- Shipbuilding

## Hydraulics for Process Pumps EO/EOS

**The semi-open radial impeller with special profile is a logical development of the original Egger impeller. The EO and EOS impeller family is mainly distinguished by the number of blades.**

### **Transport of fluids with high gas content – high suction capability**

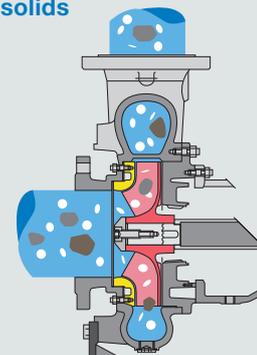
Ordinary radial impellers are known for their limited gas handling capability which results in a drastic reduction of the output to the point where delivery stops altogether. Our special blade geometry guarantees the delivery of fluids with a gas content up to 25%, as has been proven in numerous reactor loop installations in the chemical industry. In addition, low  $NPSH_R$  values can also be achieved thank to the high suction capability of this product family.

### **Higher, longer-lasting efficiency through adjustable impeller openings – also under conditions of wear**

Semi-open impellers have a fixed wear plate opposite them. The gap between them is critical for the performance data (Q, H,  $\eta$ ). For abrasive fluids, the gap gets bigger and bigger and causes a reduction in the nominal pump values. The pumps in the EO and EOS families are equipped with a wear plate that can be adjusted from the outside and with which one can reset the impeller gap back to its original size. Thus, the specified original performance characteristic values can be restored and a replacement can be usually omitted in the longer term. As an alternative, under conditions of high wear, the casing cover can also be equipped with a replaceable wear insert.



### **High efficiency pumps for homogeneous slurries containing high concentrations of solids**



### **Impeller models EOS: For freedom from clogging by particles and fibres**

The triple-bladed EOS-impeller has a larger, open spherical channel than the EO-impeller and is used primarily for slurries and suspensions of larger solids. The blade leading edge and the opposing wear plate have special designs that make it possible to transport even long-fibre components, such as occur in wastewater.

### **Transport of high consistency paper pulp and more**

Egger has been known for decades for pulp pumps in the pulp and paper industry. Fibres, high air content, etc. – these are all everyday occurrences that are very challenging. The process pump production series EO/EOS guarantees even for this case the safe delivery of consistencies as high as 8% at 100%. The large number of specific hydraulic properties make the EO/EOS production series genuine process pumps that are valued as such by our clients all over the world. They are suited for a wide range of abrasive, corrosive and viscous fluids and even multiphase suspensions, containing solids and high gas content. The process pump range is also available in a high pressure and high temperature execution.

# Hybrid Pumps TEO

Patented Vortex Pump with a hybrid impeller. Combines the advantages of our semi-open impeller with those of a Turo® Vortex impeller.



## Applications

- Grinding oil emulsions with a high proportion of air
- Emulsions with chips in the automotive industry
- SiC slurries in the solar industry
- Sewage sludge in the wastewater technology

## Features

- Stable suction characteristic during the transport of fluids with up to 10% gas content
- Interchangeability with a Turo® Vortex impeller

## Facts & Figures

Dimensions: DN 32–80 mm  
1¼–3"

Flow rate: up to 35 l/s  
550 US gpm

Diff. head: up to 30 m,  
100 ft

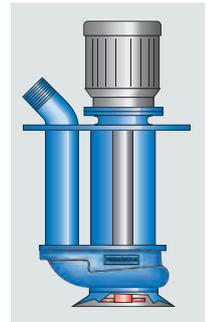
Pressure: up to 10 bar,  
145 psi

Temperature: up to 80 °C / 175 °F

## Advantages

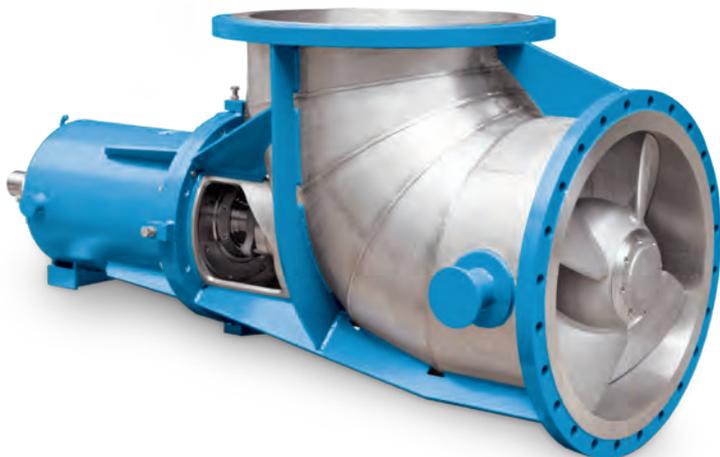
- High efficiency, also with viscous fluids
- Large, open spherical channel
- Stable startup level, especially for gas-containing fluids
- Excellent suction and stable pumping characteristics

With TEOZ cutter pumps, long aluminum or brass chips can be pumped without clogging due to an integrated cutting unit. Hybrid pumps in seal-less, dry running resistant cantilever design are ideally suited for this demanding task.



# Elbow Pumps RPP/RPG

The typical pump for large capacity at low discharge heads (circulation pump with axial impeller). Available in welded or cast construction with reinforcing ribs.



## Applications

- Crystallisation plants
- Vaporisation plants
- Reactor loops
- Sludge recirculation
- Pumping stations

## Features

- Thick blade profiles for long service life
- Gentle transport with sensitive, crystalline fluids
- Available in a wide range of metallic materials

## Facts & Figures

- Dimensions: DN 250–700 mm  
10–28",  
cast  
DN 250–1400 mm  
10–56",  
welded
- Flow rate: up to 8300 l/s  
130000 US gpm
- Diff. head: up to 10 m, 33 ft
- Pressure: up to 6 bar, 90 psi,  
from DN 600 4 bar,  
60 psi
- Temperature: up to 140 °C/285 °F

## Typical pumped liquids

- Crystalline suspensions
- Reaction mixtures
- Concentrated acids and bases
- Abrasive media
- Brine and seawater
- Fibrous media
- Sludges and waste water

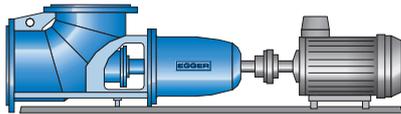
## Reliable sealing systems

There is a choice of cartridge mechanical seals as well as the classic stuffing box packing. Egger axial pumps with stuffing box packing have easy-access. This allows quick replacement of the packing without emptying of the piping nor dismantling the pump.

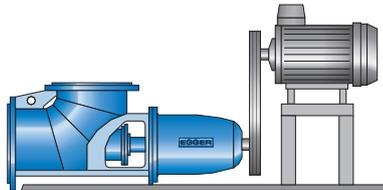
## Types of mounting

**Egger axial pumps can be specially fabricated to customer requirements for various installation types. They are available clockwise and counter clockwise as well as in cast or welded constructions. Special designs for temperatures up to 280°C and pressures up to 30 bar already exist. Versions with special dimensions allow an easy adaptation on existing elbow constructions.**

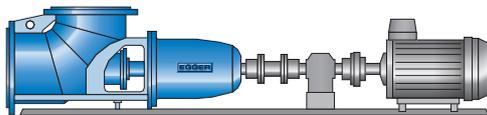
### Foot-mounted on baseplate



Direct-coupled



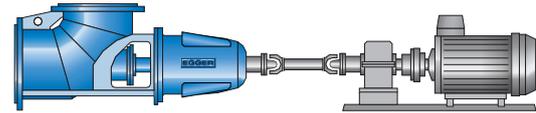
V-belt drive



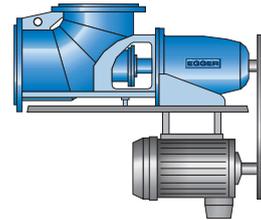
Spur gear drive



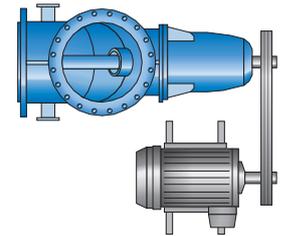
### Pump suspended in the pipeline



Motor suspended, V-belt drive



Universal joint drive with spur gear



Motor to one side on a tensioning bar

Special designs on request.

# Special Pumps

## Reactor Pump HT/HPT according to API 610

### Reactor Pump for high temperature and high pressure applications

- HT: Operating pressure up to 45 bar
- HPT: Operating pressure up to 100 bar
- Operating temperature up to 330 °C
- Centerline mounted pump design according to API 610 OH2
- Reinforced pump casing
- Available with or without heating jacket
- Base plate spring feet mounted as option



Egger Reactor Pump HT at the HDPE production site of Basell Polyofine GmbH at Münchsmünster, Germany

# Special Pumps

## Submerged Sump Pump SOT/SMT

### Vertical submerged sump pump for high temperatures and stagnant fluids

- Operating temperature up to 500 °C
- No bearings in the fluid (SOT) or high performance bush bearings (SMT)
- Available with heating jackets if needed



# Special Pumps

## Submerged Sump Pump SG/SGD (Zone 0)

### Vertical submerged sump pump for Group II, Category 1 (Zone 0)

- No bearings in the pumped liquid
- Suited for fluids containing solid particles
- Submerged lengths of up to 10 meters possible



# Special Pumps

## Cantilever Pump SOG

### Cantilever pump in a gas-tight configuration

- Double mechanical seal system, lubricated with gas or liquid
- Unlimited run-dry pump operation possible
- Bearing and shaft seal not in the fluid



Pump manufacturing in our workshop at Cressier, Switzerland

# Special Pumps

## Pilot Pump S

### Pilot Pump for pilot reactor plants

- Up to 8 m<sup>3</sup>/h and 45 m
- Operating pressure up to 100 bar
- Operating temperature up to 280°C
- Executions with heating jacket and reinforced bearings available



Turo® Vortex Pump in vertical design in hard iron HG 25.3 with hydrodynamic shaft seal Eurodyn® for the pumping of reject paper stock at the Buchmann paper mill at Annweiler, Germany

# Iris® Diaphragm Control Valve

Energy saving valve for the precise and economical control at low loss of pressure of liquids and gases that can be either clean or contain particles.



## Applications

- Air for aeration in wastewater treatment plant
- Gases
- Municipal and industrial wastewater
- Slurries and viscous materials
- Paper pulp and fibrous suspensions
- Pellets with a particle size over 0,5 mm
- Sugar suspensions
- Drinking water

## Features

- Highly precise control of the flow rate through concentric Iris® diaphragms (similar to a camera diaphragm)
- Energy-saving and low-noise control valve due to its free centric passage

## Facts & Figures

Dimensions: DN 25–400 mm  
1–16"

Pressure: up to 10 bar,  
150 psi

Manual  
operation



Electric  
operation



Pneumatic  
operation



Temperature: up to 220°C/428°F

Materials:

- Casing: GG, 1.4409, 1.4588
- Segments: Bz hard chrome-plated, 1.4435, M340, 1.4529

Special materials on request.

## Applications

**Iris® diaphragm control valves are characterized by flow which is always centered. The passage can be varied continuously, similar to a camera aperture. Thus, constant flow rates may be reproduced in any position. The ideal control characteristic according to DIN EN 60534 and its low pressure losses make the Iris® diaphragm control valve a prerequisite for an energy-saving valve in many industries. Here is a small selection of typical applications.**



### **Aeration in a wastewater treatment plant**

Used to regulate the aeration, this valve has been proven thousands of times at wastewater treatment plants. Due to the enormous energy saving, Iris® diaphragm control valves

recover cost rapidly in wastewater treatment plants. In combination with an ABB Sensyflow® mass flow meter, cascade regulation with slave loop according to ATW can be assured.

### **Viscous fluids / Centrifuge feed**

Centrifuges such as in the sugar industry or wastewater technology, can be fed accurately by Iris® diaphragm control valves.



### **Liquids and gases in chemistry and industry**

In chemistry and industry, the BSH design is used for higher system and differential pressures. It is prepared for various monitoring systems and exists as all Iris® diaphragm control valves in Atex design. The industrial design BSH fulfills the requirements of the Technical Guidelines on Air Quality Control (TA-Luft).

### **Sludge, wastewater and fiber**

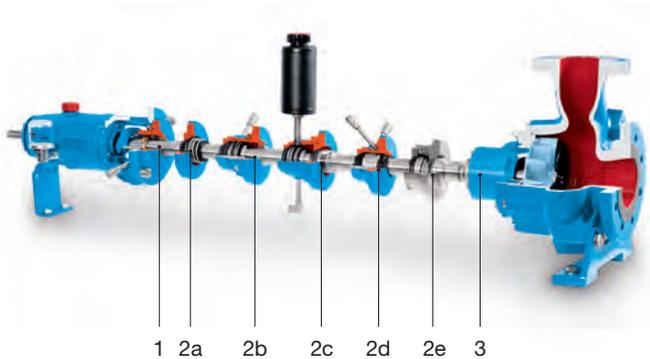
Even slurries, solid containing liquids and fibrous products can be regulated precisely. The Iris® diaphragm control valves avoids clogging due to its completely open circular-shaped passage.



# Seals

## Varioseal® shaft seals

Egger's building block system even gets extended to the design of the pump shaft seal. A variety of standard and customised seals can be configured, depending on the fluids being transported and the safety requirements. Thanks to our Varioseal® system, various shaft sealing units can be interchanged without remachining.



1. Stuffing box packing



2b. Single mechanical seal with external flushing



2d. Double mechanical seal in back-to-back configuration



3. Hydrodynamic shaft seal Eurodyn®



2a. Single mechanical seal



2c. Double mechanical seal in tandem with unpressurised liquid

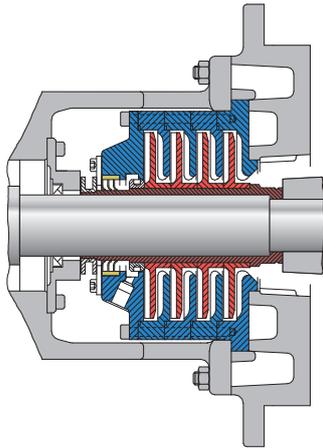


2e. Cartridge-mechanical seal

# Seals

## Hydrodynamic shaft seal Eurodyn®

Hydrodynamic shaft seals collect the fluid behind the impeller and rotate it. As a result, a liquid ring is created, that seals the pump to the atmosphere. The Eurodyn® hydrodynamic shaft seal operates without friction nor wear and is mainly suited for continuous pump operation. Eurodyn® seals have a long service life, high system availability, low maintenance and are very reliable and safe. They are also suitable for media with a high solid concentration and viscosity.



### A leak-free seal solution

Similar to the gland packing rings, the hydrodynamic shaft seal is a seal system that has been known and used for a very long time. It features contact-free operation and is practically maintenance-free depending on the pumped medium. At least one repeller is installed behind the impeller and generates enough counter-pressure by means of a liquid ring to withstand the internal pump pressure. As a result a leak-free seal to the atmosphere is guaranteed as long as the pump is in operation. Hydrodynamic seals often require special pump designs – one reason why this type of seal is not widely used.

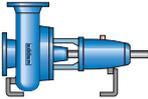
### Hydrodynamic seal seamlessly integrated in the Varioseal® system

A special feature of the Egger Eurodyn® hydrodynamic seal is its seamless integration within the Varioseal® system. No special designs are required for the pump. It also has four repellers and is available as a completely mounted unit with its own shaft sleeve. Like a cartridge, Eurodyn® is therefore very easy to assemble. At standstill, a seal ring withstands the static pressure in the Eurodyn® housing. The static seal of the Eurodyn® can be adapted to different media requirements and applications. In addition to the classic Elring seal, we offer a friction free HTS static ring as well as a special Prelon ring on a hardened shaft sleeve. Eurodyn® is also available with a grease chamber and a permanent lubrication for applications with a high level of solids. If greasing is not allowed, Eurodyn® can be provided with permanent flushing to keep solids away from the static seal. Eurodyn® has been successfully used for continuous as well as intermediate operation especially for vertical designs with clean fluids, media containing solids or viscous liquids.

# Dry mounted designs

## Type H

Horizontal design with bearing housing. Roller bearings with oil-bath lubrication. Drive by means of elastic coupling or V-belt.



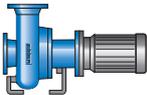
## Type V

Vertical pump with bearing housing. Grease lubricated roller bearings with re-greasing device. Drive by means of elastic coupling.



## Type HF/VF

Close-coupled pump in horizontal or vertical design. Impeller fitted directly to motor stub shaft.



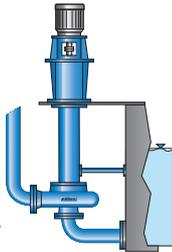
## Type VK

Vertical design with bearing housing. Grease lubricated roller bearings with re-greasing device. Drive by means of cardan shaft; motor on a higher level.



## Type SO/SOF

Vertical cantilever pump design, without shaft seal and without bearing in the pumped liquid. Absolutely safe to run-dry. For example, side mounted onto a container.

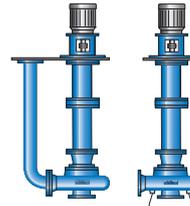


# Wet mounted designs

## Submerged Sump Pumps

### Type SG/FG

Single mechanical seal. Shafts, bearing and connection coupling in sealed intermediate pipe.



### Options

#### Type SGD

SG pump with double mechanical seal.

### Type SR

Sealing with grease lubricated radial journal bearing. Grease lubricated sleeve bearing.

## Cantilever Pumps

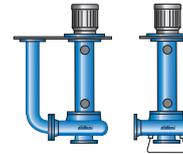
### Type SO/SOK

With motor support.



### Type SOF/FOF

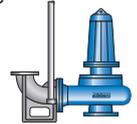
Close-coupled design.



## Submersible Pumps

### Type U

Stationary, submersible pump with electric motor. Design with quick-connect duck-foot bend and guide-rails.



### Type UM

Mobile submersible pump with electric motor.



### Type FUH/UMH

Mobile submersible pump with hydraulic drive.



# Materials

**On the basis of the specification, the specific fluid to be pumped and other boundary conditions, we will recommend proven materials. For pump casings and impellers, one can choose from a wide range of suitable material solutions, from grey iron through to wear resistant high-chrome iron to stainless steel and nickel-based alloys.**

## **GG: Grey cast iron with lamellar graphite**

For general applications without any corrosion or abrasion requirement.

## **GGG: Spheroidal cast iron with spheroidal graphite**

For general applications without any corrosion or abrasion requirement.

## **Hard Iron HG 25.3**

Extremely abrasion resistant material. For wastewater and slurries containing lots of sand. Resistant against weak acids and weak alkalis.

## **Stainless steel 1.4409 (Austenitic)**

Resistant against weak acids

and weak alkalis. Increased resistance against intercrystalline corrosion. Resistant against fluids with low chloride content. Moderately wear-resistant.

## **Duplex stainless steel 1.4593 (Austenitic-Ferritic)**

Resistant to a number of mixed acids and mixed alkalis. Increased resistance to stress corrosion cracking, especially from fluids containing chlorides. Moderate to good resistance to wear.

## **Highly corrosion-resistant stainless steel 1.4588 (Austenitic)**

Resistant to a number of acids and alkalis. High resistance to stress corrosion cracking, especially from fluids containing

chlorides. Moderately wear-resistant.

## **Hastelloy C-2000 / Hastelloy B3 (Nickel-based)**

Hastelloy is suited for a variety of highly corrosive acids, depending on temperature and concentration. Hastelloy alloys are moderately wear-resistant. Hastelloy is a registered brand name. Inconel is a competing product with similar properties.

## **Monel 411 (Nickel-based)**

Very often used with sea water and brines to a maximum of

Much more additional information about pumps and valves can be found at

[www.eggerpumps.com](http://www.eggerpumps.com)



120 °C. Highly resistant to hydrofluoric acid (HF) over a wide temperature and concentration range. Moderate to poor wear resistance.

## **Nickel 210 (Nickel-based)**

Most important use is for sodium hydroxide (NaOH) and other alkalis. Moderately wear-resistant.

All other materials that can be cast as well as special materials such as Ni-Resist D2B, titanium, zirconium, etc. upon request.

# Industry solutions

**Industry sectors in which Egger pumps have proven themselves over a long time:**

- Chemical industry
- Petrochemical industry
- Waste water treatment
- Steel industry
- Power industry
- Sugar industry
- Automotive industry
- Paint and varnish industry
- Rubber industry
- Solar industry
- Textile and fiber industry
- Paper and cellulose industry
- Food industry
- Building industry
- Shipbuilding
- Mining industry
- Recycling industry
- Nuclear sector
- Offshore

## Performance range

**As service range (also characteristic field), we designate the graphic representation of the volume transported and discharge head as a function of the rated speed in the definition of the pump performance.**

The service ranges of our pumps are available under

[www.eggerpumps.com](http://www.eggerpumps.com)

# Egger Service

**Egger guarantees a maximum plant availability during your planned shutdown, by offering various individual service package solutions – even after the warranty expires.**

## Service Package Basic

This service package includes a maintenance of your product with subsequent consulting and commissioning. We take care of the pick-up and delivery service to simplify the revisions for you in our Service Centers.

## Service Package Efficiency Plus

In addition to the classic product maintenance, the Service Package Efficiency Plus includes a complete analysis with

duty point and efficiency optimization in order to meet today's requirements in terms of sustainability and energy efficiency.

## Full Service

This solution offers an all-round carefree package. On request, your Egger unit can be supplied with a 5 years warranty extension if specified during ordering. During these 5 years, we take over the product maintenance for you.



# Company

**Emile Egger & Cie SA is a medium-sized, independent and owner-operated Swiss industrial enterprise with a concentration on the development and manufacture of pumps and Iris® diaphragm control valves.**

The Swiss pumping pioneer Emile Egger founded the company in 1947 in Cressier and began to manufacture immediately. Already at that time, our speciality was the pumping of fluids laden with solids and gas. Thanks to its careful, step-by-step expansion, the enterprise was able to retain its independence and has remained a family undertaking to this day.

We seek to be close to our customers – geographically, as well as professionally. Thus, over the years, we have built subsidiaries in 10 European countries, Asia and North America. A network of trading partners puts us that much closer to our customers.



# Quality



## **Integrated Management System (IMS)**

Egger's Integrated Management System groups different requirements and aspects of a variety of standards and guidelines; these include, for example, ISO 9001 for quality, ISO 80079 for quality in areas threatened by explosions, ISO 14001 for the environment, EKAS 6508 for health and occupational safety. Egger is qualified by EDF for the fabrication of rotating equipment for the nuclear sector.

## **Quality assurance**

By maintaining its standards and norms, Egger guarantees continued improvement of its performance. This is being validated through such processes as internal and external audits and by means of administrative review. Already during the proposal stage and again later in the development phase, a variety of instruments provide for professional development and the high quality of the delivered product.

# Environment

## Environment and sustainability

The production facilities of Egger Pumps are located in the unspoilt countryside between the South foot of the Jura and Lake Neuchâtel. Maintaining this habitat in its natural state is of paramount importance to both management and employees. The environmental activities of the firm exceed the legal requirements of the Neuchâtel Canton and the Swiss Confederation. The avoidance of environmental pollution, such as for example, by reducing emissions, maintaining water purity and reducing energy consumption is of major importance to Egger.

## Climate protection and recycling

The firm is motivated out of a sense of conviction to protect and sustain the climate. By voluntarily enrolling in the program of the Energy Agency for Economics (EnAW), Egger is making a contribution towards active reduction of CO<sub>2</sub> emissions. Indeed, Egger is receiving the CO<sub>2</sub> certificate of the Swiss Energy Agency for Economics. Metallic and mineral waste stemming from production is systematically separated in the large recycling hall and subsequently re-used. That permits the interim storage of all production waste, segregated by type. The recycling of cutting oils and emulsions is carried out internally in the machining centres. Contaminated water used in production and operations flows first through in-house wastewater pre-treatment before it is brought back to drinking water standards in the municipal wastewater treatment plant.



Elbow Propeller Pumps RPG for the recirculation of activated sludge at Berlin, Germany



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