KIESEL

... moving liquids

Pumping Technology
Technical Construction
Eccentric screw pumps

History

From a former bell foundry to today's specialist for Pig cleaning technology, Wine cellar technology, Industrial pumps and Industrial fittings

The G.A. KIESEL GmbH is a metalworking company with a long tradition. Founded in 1864 as a bell foundry – until today we have grown into a medium-sized family business with competence in the manufacturing of fittings, pumps and plant constructions.

At the current location in the industrial area "Böllinger Höfe" in Heilbronn KIESEL disposes production space of over 3,700 m² and offices of 700 m² as well as a high rackwarehouse with 6,000 storage spaces. The close cooperation with our customers and suppliers initiates KIESEL constantly with new ideas in the optimization of problem solutions.

A CAD supported construction and planning departmentprovides for prompt implementation of new concepts. CNC production systems and last not least a quality assurance system in accordance with EN ISO 9001:2008 guarantees an extensive offer of current quality products.
Today G.A. KIESEL GmbH technology program offers a wide range of products.

Beginning with fittings made of stainless steel, eccentric screw pumps, impeller pumps, rotary lobe pumps, hose pumps, mixers, heat exchangers and flotation systems up to osmosis systems and the pigging technology.

In close cooperation with our customers we have expanded our program in the past few years. Due to extensive tests and research we can provide you today with individual solutions.

New ideas create innovative solutions

ATEX 95 (RL 94/9 EG)

EHEDG
European Hygienic Engineering & Design Group
Company Member

Pump Technology

General Description

Eccentric pumps are rotating positive displacement pumps. With a positive displacement pump the mechanical energy produced by a motor is transferred in a pressurised energy term to any liquid found in the displacement area. This is done via a displacement unit such as an eccentric screw or a rotor. The displacement unit rotates. Hence we talk of rotating positive displacement pumps.

Their functionality combines the advantages at centrifugal and oscillating reciprocating pumps. The eccentric screw pump consists of a rotating displacement unit which is either an eccentric screw or a rotor. Its second element is the stator.

The rotating part, the rotor, is in the shape of a rounded single-threaded spiral shaft with a large pitch.
The static element is the stator and it is shaped like a double-threaded inside screw. It thereby doubles the pitch of the rotor.

Consequently cavities arise between the rotor and the stator. They are always symmetrical in size when the rotor is rotating. When the rotor is set to rotate, these cavities and consequently the substances in them to be propelled, are shoved along in a screw-like manner from the suction to the pressure side.

With respect to the pitch the rotors of the KIESEL eccentric screw pumps possess a relatively large eccentricity.

Whereupon it is possible to propel large solid objects through the pumps without damage. In addition the construction lengths of the pumps are reduced to a minimum. The relatively small low friction surface area of the rotor permits economical pumping performance.

To transfer this motion from the central drive to the rotor it is necessary to have a single-joined shaft with two compensating ball and socket joints. This single-joined shaft connects the drive and the rotor. It is not necessary to have any other bedding for the rotor than that of the stator.

The watertight line between the rotor and the stator is specified for each rotor setting. This ensures that the pressure area is always separated from the suction area. The eccentric screw pumps are sell-evacuating and thereby extract themselves through suction. This self-extraction through suction is done without any liquid assistance.

Range Of Application

Their range of application comprises low and high viscosity fluids. Whereby these can embrace fibrous or abrasive admixtures and gases. Their range of application extends as far as pastes that can still be pushed through a piping system.

The chemical industry

Sewage, acids, alkalis, dispersions, pastes, resins, bonding agents, suspensions, essences, aromatic compounds, gelatine, liquid gum, buna N

The pharmaceutical industry

Dispersions, suspensions, emulsions, pastes, creams, fango enzymes, blood, lecithin

The cosmetic industry

Skin creams, concentrates, hair shampoos, essences, soaps, hand washing pastes, bathing additional agents, lotions, gelatines, oils.

The varnish und paint industry

Dispersion colours, dispersion paints, varnish bonds, pastes, rough plaster paint, water soluble varnishes, acrylic paints, resins, plasters, colour pastes, bonding agents, tile bonding agents, knifing filler, glazier's putty

Sewage technology

Fresh sludge, digesting sludge, activated sludge, dehydrated sludge, milk of lime, sewage including solid particles, oil sludge, cooling tower sludge, coal sludge

The building industry

Mortar, bitumen, tar, cement sludge, plaster mortar, building excavation water

The foodstuffs industry

Apple purée, ice-cream, sausage mixture, honey, mustard, tomato pulp, mayonnaise, cheese, jams, concentrates, essences, curds, fats, oils, jellies, chocolate mass, sugar solutions, molasses, milk of lime, meat extracts, rubbish, sewage, glue, broth, fish oil, fish liver, vegetables and potato fodder

The beverage industry

Wines, beers, spirits, liqueurs, yeast, syrup, herbs, stone fruit mash, pomaceous fruit mash and grape mash, thick iuice, draff, milk, whey, cream, yoghurt, cheese, desserts, curds

Only a few examples can be shown here where KIESEL eccentric screw pumps have admirably proved their worth. Our pumps are successfully used in many other branches of industry, as tor example in agriculture, ship building, textile industries, paper industries and sugary refineries.

Layout criteria

Propulsion Flow

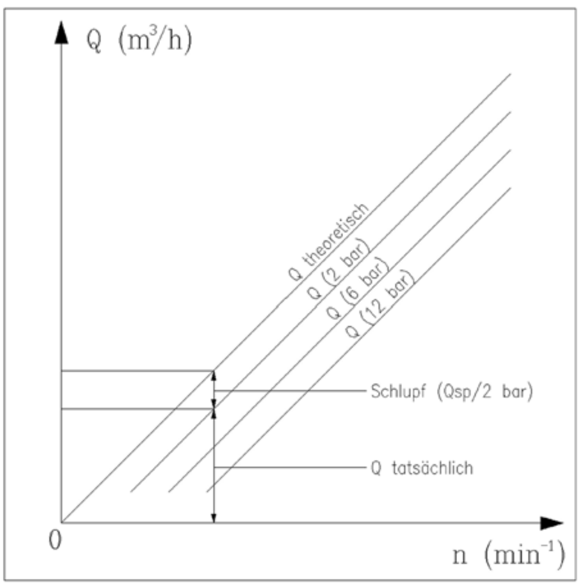
The following formula combination is valid tor the theoretical propulsion flow.

$$Qth = 4 \cdot e \cdot d \cdot S \cdot n$$

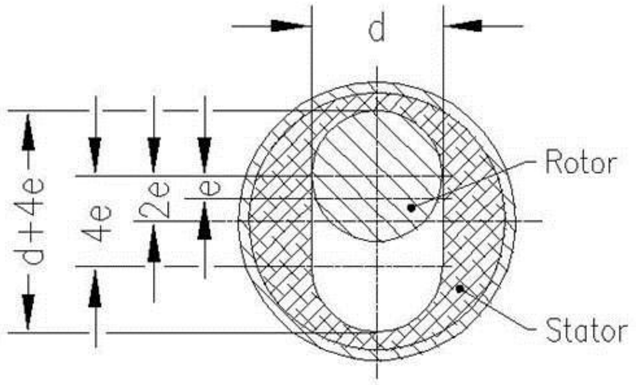
e **Eccentricity of the rotor (m)**
d **Diameter of the rotor cross-section (m)**
S **Pitch of the rotor or 2 rotor pitches (m)**
n **Revolutions of the rotor (1/h)**

$$Q = Qth - Qsp$$

The lost volume Qsp can only be ascertained through trials.



The propulsion characteristics of eccentric screw pumps Q independent of the number of revolutions.



The dimensions at the stator enable the rotor to revolve in it without any play. Consequently the propulsion height—O does not permit any back-flow. If the propulsion height is greater, the QSp increases linearly. Whereupon the dimension tolerances of the stator and the rotor as well as the elasticity of the stator are decisive. The viscosity and temperature of the fluids also have a great impact on the situation.

The elasticity of the stator prevents you from drawing any correlation between the propulsion current-Q with a given propulsion height, and the respective viscosity of the propelled substance. To determine the setup of the pumps, the propulsion volumes are independently ascertained from the performance curve or table of the trial values of the various pressures and revolutions.

With positive-displacement pumps it is not possible to regulate the volume current by throttling the pressure side. The volume current can only be amended by regulating the bypass and the rotation.

The size of the eccentricity (e), the diameter of the piping (d) and the pitch (S) are determined by the size of the pumps. The number of pump revolutions is variable. It depends on the propulsion substance and the application in question.

The dependence at the number of pumping revolutions on the propulsion substance is determined by two criteria:

I. Abrasion
2. Viscosity

Suction height / suction extraction behaviour

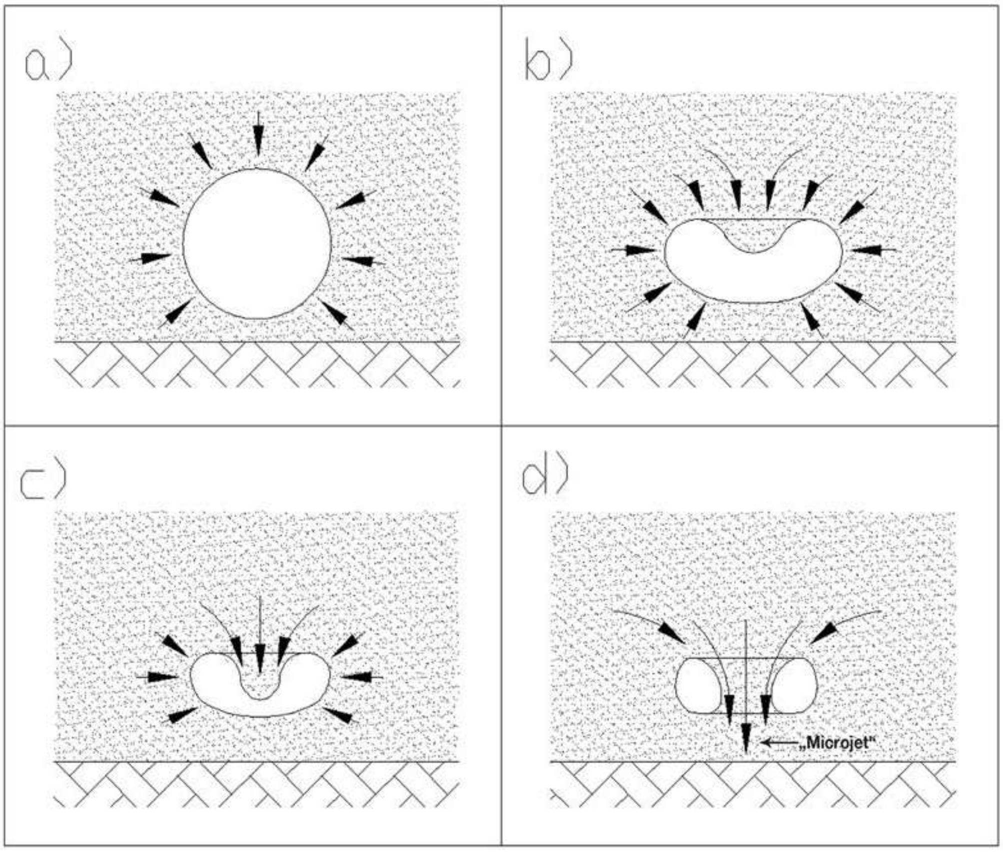
The generally pulsation free hydrostatic propulsion art and the elastic stator give the eccentric screw pump a good, sell-extraction suction ability as well as good NPSHR values.

It is therefore possible to dry-extract fluid and homogenous propulsion solvents. With high viscosity solvents or high pumping revolutions, care must be taken that the propulsion flow does not break down since dry running would disintegrate the stator!

The permissible suction height (Hgeo) of a pumping unit during running is determined by the construction as well as the cavitation behaviour.

In vaporizable fluids cavitation occurs at the paint of smallest pressure and therefore where there is the greatest speed. At this point steam bubbles form themselves in the flowing fluid. The bubbles are swept along in the flow. When they hit points with high pressure they implode into one another and disintegrate.

During this implosion the contents of the steam bubbles condense at supersonic speed [t ≤ 0.001 s). In the cavities there are pressure points of up to 1000 bar. They release blast waves with frequencies up to 2 kHz [supersonic speeds).



At the beginning of the implosion the generally rounded bubbles (a) become indented (b). With those near to the wall indentation takes place on the averted side. With bubbles in mid-flow indentation takes place on the side with the greater pressure.

With increasing indentation (c), the bubbles form a micro-jet which in turn blasts these bubbles into two or several parts (d). If the bubbles are near to the wall, the micro-jet hits the wall surface at a cracking speed.

This results in the machined parts of the top surface of the wall being subject to an ever increasing strain from these cavitation blasts. Where upon material fatigue as well as fatigue fractures occur at various points. The emergence and collapse of the steam bubbles is called cavitation.

The bubble mechanism destroys the material top service through cavitation erosion. At first only small dells appear on the top surface of the material. These rapidly expand into larger rough dells. Eventually a relief similar to a lunar landscape evolves. The unevenness of the cavitation erosion increases and often leads to complete destruction of the positive-displacement rotor.

In addition the cavitation makes itself noticeable through the reduced propulsion performance, an increasingly agitated through-flow and ever increasing noise.

Preventative measures against cavitation

- **Geodetic suction heights reduce or enlarge inlet heights**
- **Use a short suction pipe with a large cross-section if possible.**
- **As far as possible avoid fittings, bends, quarter bends, on the suction side or a design with a large radius**
- **Maintain the temperature of the fluids as low as possible**
- **With closed in suction or inlet receptacles cover the liquid level with gas pressure**
- **Reduce the number of revolutions**

There is no material that can withstand these cavitation attacks. The more brittle a material is the more it is susceptible to cavitation. Examples of materials that best stand up to cavitation are stainless steel, steels with a large chrome content (non-rusting steels] and types of bronzes.

Pump components, such as the positive- displacement rotor, exposed to cavitation should be as smooth as possible and well polished.

To ensure trouble-free safe running of the pump, care must be taken that the evaporative pressure of the fluid does not drop at any point in the pump or in the tube.

Therefore to ensure safe running there should be **an excess of the normal inlet height (energy height)**. This means that the liquid level should be pushed far into the pump by the air pressure. The difference between the energy height at a particular point, a gushing fluid and the height of the evaporative pressure is defined as the net positive suction head available.

We differentiate between the following net energy heights:

l. The prevailing net energy height of the unit is internationally described as the **NPSHA value** (net positive suction head available).

2. The required net positive suction head of the pump is internationally described as the **NPSH R-value** (net positive suction head required).

The **NPSHA** (net positive suction head available) is indicated at the inlet cross-section of the pump in the position ‚S‘ in the middle of the suction support.

It is formed out at the actual dominating absolute pressure minus the evaporative pressure (pD) of the fluid in the inlet cross-section plus the net positive suction head available flow (Hs) out of the intermediate flow speed (vs] in the reference cross-section.

The **NPSHR** is the required net positive suction head available from the pump and the excess inlet height to avoid the formation of steam bubbles and cavitation in the pump.

The size of the NPSHR results from the sum of the inside influences in a pump which effect the flow of the fluid.

For example inner influences can be:

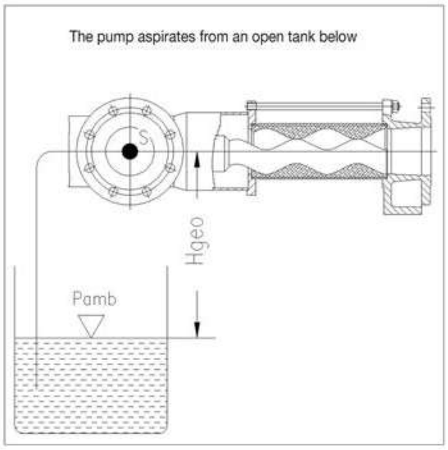
- Abrasion resistance
- Interior drop in pressure as a result of an increase in the speed of the flow through reduction of the cross-section.
- The effect of centrifugal forces and inertial strength on the pressure energy of the liquid.

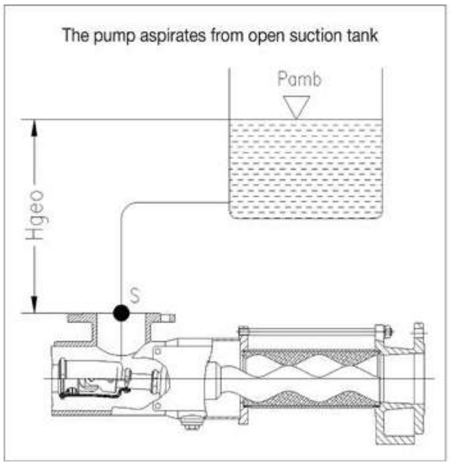
Thereby the NPSHR value is dependent on

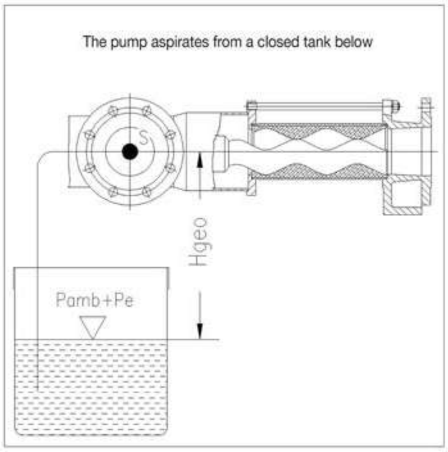
- The geometry of the positive displacement body of the rotor and the stator
- The splitting geometry
- The propulsion flow
- The number of rotations

Furthermore the NPSHR value is dependent on the physical characteristics and the temperature of the fluid to be conveyed.

Therefore when specifying the NPSH values, the substance as well as the temperature of the fluid is always to be born in mind.







In order to operate a unit tree from cavitation, it is recommended to select a large value of NPSHA in so tar as this economically possible. In any event precautions should be taken to ensure that there is an increased factor of safety of at least 0.5 m (0.05 bar).

The values for NPSHR given by the pump manufacturer are intermediate ones and are not to intended to be deviated from.
The manufacturer should always be consulted before laying out a pumping plant.

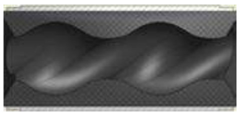
Manometric height (propulsion height)

The possible pressure that can be achieved by a KIESEL eccentric screw pump at the outlet pedestals is dependent on the number of rotor and stator ascents. The KIESEL eccentric screw pumps are manufactured in one, two and four stage constructions.

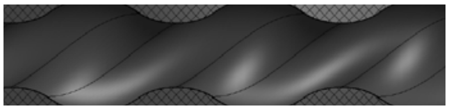
The one stage construction means that whatever position the rotor in the stator is in, it keeps a propulsion chamber closed. Respectively with the two stage construction, two chambers are always closed, and with the four stage construction tour chambers are closed.

Greater propulsion pressures can be reached at short notice. Pumps even with multiple stages up to 120 bar can be mode for special tasks such as reversible membrane diffusion.

Depending on the number of stages, the pumps achieve the following pressures at theoutlet supports:



one-stage up to 6 bar



two-stage up to 12 bar

four-stage up to 24 bar

The maximum permissible propulsion height of eccentric screw pumps should be always protected by suitable protection equipment such as safety valves or contact mano-meters.

With a low number of rotor revolutions it is recommended to move up to the next pump stage number in order to achieve greater efficiency. This can be compensated with a higher stepped pump.

Similarly a higher stepped pump is to be used with very abrasive substances. You can glean the maximum attainable pump pressures for the various steps from the following table:

1 bar = 10^5Pa	Substance		
Number of stages	homogeneous	lightly abrasive	stongly abrasive
one stages	6	5	3
two stages	12	10	6
four stages	24	20	12

The maximum pump pressure with homogenous and abrasive substances. Pressing pressure at the outlet pedestals is in bar.

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Drive performance / Propulsion flow

The power requirement on the pump shaft can be read from the previous table. This values are based on a water temperature of 20° C and on air pressure of ca. 1013 hPa.

The power requirement is dependent on the entire efficiency of the pump, propulsion flow, propulsion height, thickness and viscosity.

KIESEL eccentric screw pumps are very efficient!

This pumping efficiency, which attains 50 to 80%, is synergetic of the hydraulic, mechanical and volumetric efficiency. It depends on the amount and type of substance to be propelled along, number of revolutions and differential pressure. Factors for calculating power requirements with ever increasing viscosity are:

Viscosity in mPas											
	500	1000	2000	4000	8000	10000	20000	40000	80000	160000	200000
factors	1,2	1,3	1,4	1,5	1,7	1,8	2,2	2,54	3,1	3,4	4,5

Temperatures

The main criterion affecting the stability of the eccentric screw pump temperature lies in the choice of stator material.

Elastomere stator quality	**International identification**	**Wear restistance**	**Permissible temperature °C**
EPDM	Buna AP	good	90
Hypalon	CSM	good	110
Nature commercial rubber	NR	very good	70
Neoprene	CR	very good	100
Buna N	NBR	very good	110
Buna N bright	NBR	good	90
Polytetraflour ethylene	PTFE	good	90
Silicone commercial rubber	SI	good	140
Viton	FPM	good	150
Vulkollan	PUR	very good	60

Technical executions

Chemical stability

The abundant selection of materials in our programme for casings, rotors and stators guarantees a multiplicity of applicationpossibilities tor eccentric screw pumps in every branch of industry.

Our decodes of experience make it possible to choose the right material to suit the particular requirements of pumps.

Pump chasings

Depending on the required operating conditions, the pump casings can be produced out of Cast iron grey cast iron or stainless steel (304/316 L), covered in plastic, rubberised coatings or ones out of special alloys.

As eccentric screw pumps are not dependent on angle single particular direction of rotation, the pump casing can lie on the suction or pressure side, depending on the rotational direction of the rotor.

Rotors

With the KIESEL eccentric screw pumps we differentiate between metal cut finished solid rotors and hollow rotors.

The solid rotors are made out of various types of steel. Whereby the top surface is maintained exceptionally flat to ensure a long serviceable life for the rotor and the stator.

The hollow rotors are made out of tubing with a special process tor pump sizes SP 5 to 20. For large types at pumps the hollow rotors are cast. Thereby the weight of the rotors is reduced by 80 - 90%.

The hollow rotors are mainly applied in mobile pumps, in pumps with many revolutions per minute and in submerged pumps. They enable you to achieve eccentric screw running without hardly any vibrations: great care being given to the ball and socket joints and the bedding. As a result at this the serviceable life of the stators, ball and socket joints, bearing and shalt seals is extended.

Materials for solid rotors:

Chromium steel material no. 1.2436 and 1.4021 hardened
Chromium stainless steel material 304
Chromium stainless steel material 316 L special materials

Coated rotors:

Hard chromed eutectic coating
Ceramic coating
Coating with PTFE-lining

Materials for hollow rotors:

Chromium stainless steel material 304
Chromium stainless steel material 316 L
Construction steel St 52 hardened top surface,
eutectic coating on pre-specified materials.

All the listed rotor materials can be integrated into the one step, two step and four step pumps of every product line.

Stators

The KIESEL eccentric screw pumps are fitted out with the appropriate stator to achieve the best possible serviceable life for a particular substance to be propelled along. The stability of the stator for any new substances that you may switch to has to be verified with the supplier. Operating temperatures recommended for each kind may not be exceeded. Refer to temperatures in the layout criteria.

We supply 25 different quality stators. For every substance to be propelled there is a chemically and physically suitable resilient quality to be found in this selection.

Standard constructed stators have an elastic commercial rubber quality. The commercial rubber is firmly and without being able to be turned vulcanised in to a steel jacket. This steel tubing can only be seen from the outside.

The stators are supplied in one step, two step and four step constructions. The stators can be changed to suit every product line. For technical reasons, the input and output sides of the stator are always supplied cone shaped. In order to propel highly abrasive substances, the stator is constructed in a contractible form. Abrasion arising from the propulsion of such substances particularly affects the stator.

To compensate for abrasion, the stator is tightened up with a simple clamping device. This increases the serviceable life of rotors and stators. It is possible to operate these economically working with heavily abrasive substances.

Stator materials – elastomers:

- Natural commercial rubber (NR)
- Bright Neoprene (CR]
- Soft natural commercial rubber (NR)
- Bright buna N (NBR)
- Hard butadiene (NR)
- Bright hypalon (CSM)
- Butyl commercial rubber (IIR)
- Fluorine commercial rubber (T)
- Ethylene and propylene commercial rubber (EDM; EPDM)
- Silicone commercial rubber (SI)
- Buna N (NBR)
- Viton (EPM)
- Neoprene (CR)
- Vulkollan (PUR)
- Hypalon (CSM)

Stators made out of solid matter:

- Polyamide (PA)
- Polypropylene (PP)
- Polytetrafluor ethylene (PTFE]
- Several different special materials
- Metals and steel

Ball und socket joints with rotating parts

Power transmission und compensaition for the axial shift of the rotor shaft is achieved with two simple joints linked to one another via a single-joined shaft.

The KIESEL eccentric screw pumps are fitted out with three different types of joints:

Pin joints - shaft joints - cardan joints

Each joint can be capped with sleeves and stainless steel collets. The cardan joints are also supplied non-capped in a stainless conduit.

Material combination between the casings and the rotational parts

All the construction forms are supplied in every applicable material combination. Years of practical experience have deemed the following material combinations between the casings and rotational parts as standard ones.

I.
- Casing parts out of grey cast iron casting
- Rotational parts out of chromium steel 1.4201 or respectively 1.2436 hardened.
- Hardened and capped shaft joints out of 9 SMN PB 28K steel
- Rotor shaft out of chromium steel 1.2436 hardened.

2.
- Casings out of chromium stainless steel 304 or respectively 316 L
- Rotational parts of chromium stainless steel 304
- Pin shafts capped out of stainless steel 304
- Hardened and capped cardan shafts out of chromium steel 1.4201
- Non-capped cardan shafts out of stainless steel 304
- Rotor shafts out of stainless steel 304
- Rotor shafts with a special wear resistant construction out of stainless steel 304 with eutectic coating.

3.
- Casings out of stainless steel 316 L
- Rotational parts out of stainless steel 316 L
- Capped pin shafts out of stainless steel 316 L
- Hardened and capped cardan shafts out of chromium steel 1.4021
- Non-capped cardan shafts out of chromium nickel molybdenum steel 316 L
- Rotor shafts out of stainless steel 316 L
- Rotor shafts with a special wear resistant construction out of stainless steel 304 with eutectic coating

Materials for pumping suction casings and pumping pressure casings

- GG 20 grey cast casting iron
- Steel St 37
- Steel casting
- Stainless steel 304
- Stainless steel 316 L
- Siluminium
- Silumin B grey cast casting iron or rilsanated steel.
- Grey cast casting iron or rubber coated steel
- Teflonated steel casting

Materials for the pillow block and intermediate flange:

- GG 20 grey cast casting iron

Sealing shafts

Shafts can be sealed with gland and collar bushes or with a rotating mechanical seal.

Gland packing

The KIESEL standard gland packing is fitted out with 4 - 6 packing rings.

For special operating circumstances the packing seal can be fitted with a sluice or respectively a blocking chamber ring.

When pulling on the gland stay, the soft packing is axially sealed. Whereby it lays on the shaft as well as on the outer wall of the gland area (seal absorption) and there produces a radial compression of volume. If the pressure is too strong, friction will increase considerably during operation.

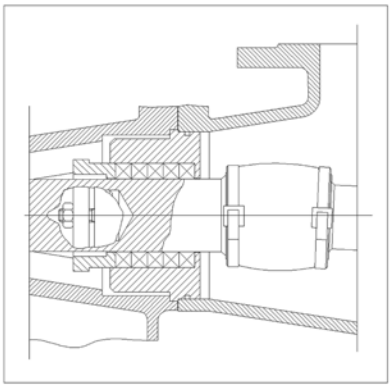
To avoid overheating and the corresponding self- destruction, the gland packing must be driven with adequate leakage. The leakage however does not remain constant. The packing sets and wears out. Therefore the leakage has to be examined at regular intervals. If necessary the gland stay should be readjusted.

There are the following possibilities for a gland with blocking chamber ring:

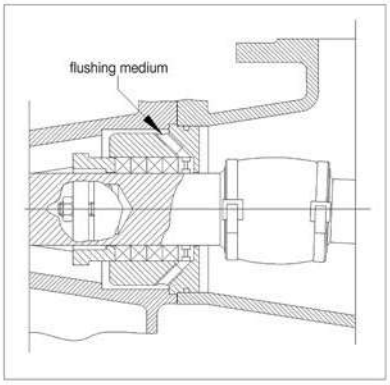
- Supply sealing liquid below 0.5 bar. Excess pressure opposite to the suction casing or pressure casing (p blocking - 0,5 bar = p pump)
- Supply lubricating agent
- Supply fluid to prevent air entering the propulsion solvent, as, for example during suction operation.
- Supply coolant, heating fluid or steam.

KIESEL- soft packing is applied with the following materials:

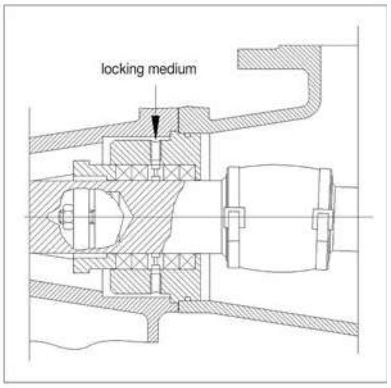
Colton, Kevlar, PTFE, Graphite, Ramie



Standard gland packing with soft packing



Standard gland packing with soft packingand flush ring for strongly abrasive, cristalline media



Standard gland packing with soft packing and lantern ring for strongly abrasive and hardening media

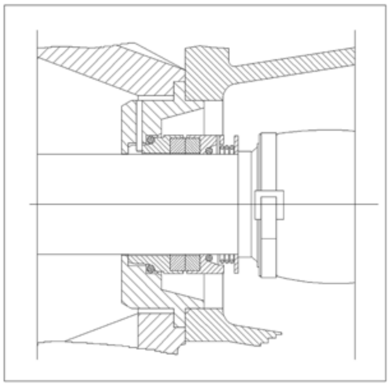
Rotating mechanical seal as of DIN 24960

Depending on the operating conditions, the pump shafts can be sealed with mechanical rotational seals in various layouts and gliding pairs. Despite the considerably narrower sealing slits, the rotational mechanical seals induce far less friction than large surface area rubbing gland packing as they form a stable lubrication film in the sealing slit. It there is a fast running speed, then this is at considerable significance.

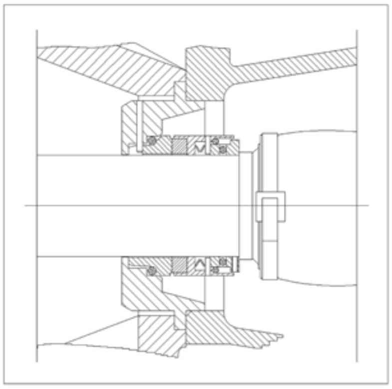
To compensate for sealing surface wear and axial shaft movement, one of the sealing rings is axially moveable.

It is described as a sliding ring and is pressed onto the counter ring with one or more springs. Rotational mechanical seals are maintenance tree. For extra sealing we use the following:

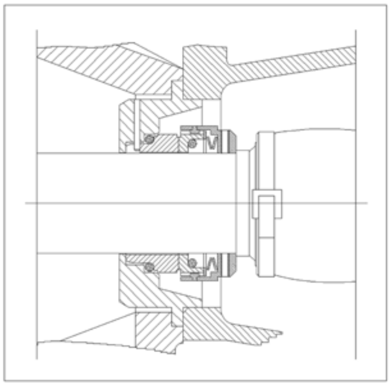
O-rings, elastomer shells and expansion bellows out of PTFE or metal. The sliding ring is firmly fixed to the shaft and rotates with the shaft. The counter ring is firmly fixed to the casing and remains stationary.



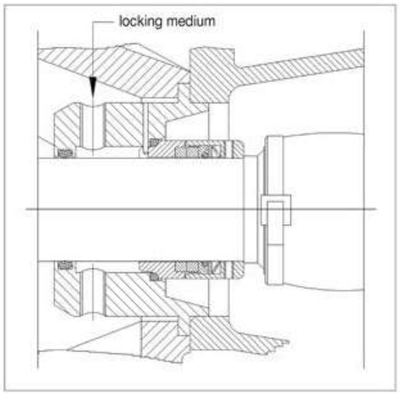
Mechanical seal single-acting, independent of the direction of rotation (open spring element)



Mechanical seal single-acting, independent of the direction of rotation



Mechanical seal single-acting, independent of the direction of rotation (open spring element totally sealed)



Mechanical seal single-acting, independent of the direction of rotation with quench for clean use

Back to back rotational mechanical seals:

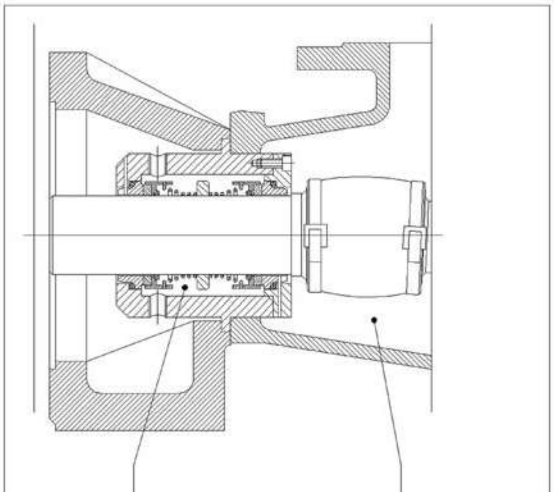
Back to back rotational mechanical seals are used for unclean substances such as solid matter inclusions or abrasive ones. They are also used for fluids tending towards crystallisation or those which have to be propelled after saturation point has been reached or those which vaporize at a slight increase in the temperature or the pressure.

For toxic fluids, a back to back rotational mechanical seal is likewise required as a shaft seal.

KIESEL rotational mechanical seals are constructed with the following gliding pairs:

Oxid ceramic carbide, chromium steel carbide, silicium carbide silicium carbide, silicium carbide carbide.

Attention!
The recommended blocking chamber pressure must be maintained during the entire running time to guarantee this kind of sealing function!



Mechanical seal single-acting

Connection possibilities

- Flange according to DIN and ANSI
- Sterile flange
- Clamping flange

Screw threads such us:

- Inch inside screw thread
- Inch exterior screw thread
- Round thread as of DIN 11851
- Aseptic screw threads
- Special screw threads
- Filter connection

Accessories

Overview

- Switches (e.g. pole change switch, motor protection switch)
- Frequency regulation
- Bypass, excess pressure protection (corner valve)
- Dry-running protection, pressure independent control
- Controls, e.g. level controls
- Temperature sensor
- Filter, feeding screw
- Paddle mechanism
- Tightening up stator tension
- Spooler protection
- Heat or respectively cooling jacket
- Height adjustable basic frame with concave feet
- Chassis

model series FT

The model series FT is desgined to promote products with high amount of solid pieces, mash, yeast and filter cake without any problem. This model series of pumps is used as a high concistency pump with a built in funnel and as a liquid pumo with a closed funnel and screw thread connection.

model series FTF

KIESEL-flat mash pumps FTF are specially constructed for use under de-stemmeing machines, graters or mills. The following characteristics are combined in this model series:
Flat funnel - low pour height of the de-stemming machine - hollow rotor with high eccentricity - vibration-free pump characteristics - slow speed - particularly suitable product promotion control by way of level sensor.

model series TP

This model series is used for pumping high-viscosity products out of tanks, kegs and containers, which can not be vacu-umed out otherwise, for example: concentrates, marmelade, vicous products up to 200.000 mPas.

The product fixing is due to the following:

- Wall racks
- Tank lids
- Crane or balance mounting

Depending in the desired application conditions, different pump drives are available, for example: variable speed gear, flame-proof drives and drive motors wirh frequency converter. Two-staged stators and rotors are used for higher pumping pressure up to 12 bar.

Feeding screw and paddle mechanism

The main area of application for the eccentric screw pump is with highly viscose to extremely viscose fluids. As the viscosity increases the fill factor of the pump decreases. To prevent this or at least to reduce it to a permissible amount there are devices which convey the material to be conveyed to the propelling screw.

The feeding screw is attached to the intermediate shaft. Whereby the feeding screw terminates at the pump end in a circular packing space. This least covers one of the spirals. In this manner there is good propulsion of the material to be conveyed.

With extremely high viscosity, a paddle can be fitted in the casing connection filter to prevent bridges forming over the feeding screw.The paddle mechanism has its own drive and can be set up in various ways to suit the particular kind of material to be conveyed.

KIESEL ... moving liquids

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- Pigging Technology
- Wine Cellar Technology
- Industrial Technology (pumps and mixer)
- Tartaric stabilization by electrodialysis
- Industrial fittings
- Formed assemblies
- Fire Brigade/Environmental

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