



Pumps and pumping systems

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# AHLSTAR

end-suction single-stage  
centrifugal pumps



# Engineered for excellence, evolving for your needs

With over 250'000 units delivered worldwide since its very first designs in the mid-1980s, the AHLSTAR range of end-suction single-stage centrifugal pumps has earned a long-standing reputation for excellence.

AHLSTAR pumps are engineered to meet the most demanding hydraulic requirements for all types of liquid, making them the ideal choice for challenging pumping operations. Designed in accordance with ISO 5199 and ISO 2858 international standards, our pumps consistently surpass market requirements and customer expectations, ensuring exceptional performance and reliability across all applications.

- Pulp, paper, and board
- Chemical process industry
- Fertilizers
- Water and wastewater
- Food and beverage
- Metals processing and mining
- Biofuels
- General industry
- Oil and gas
- Hydrocarbon processing
- Power generation



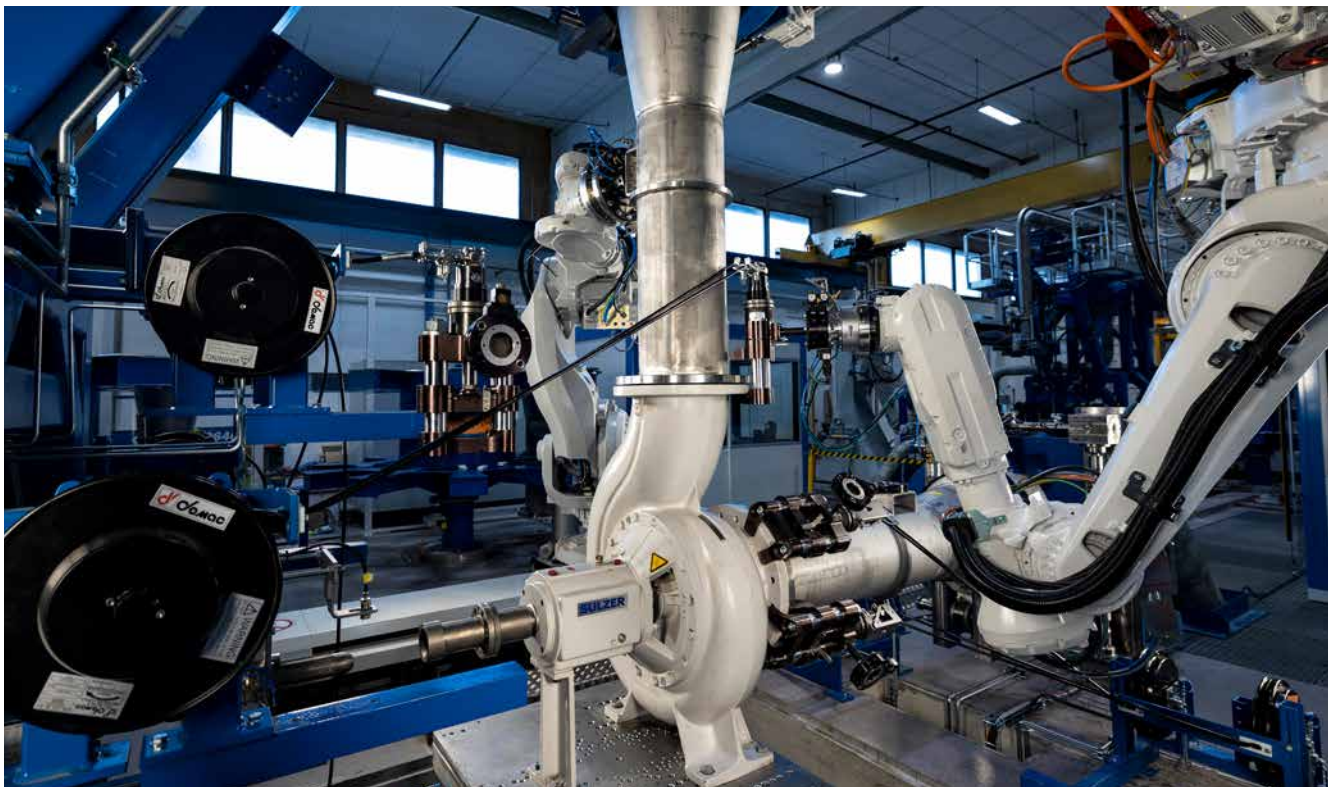
| Liquid                              | Temperature up to 210°C / 410°F | Pressure up to 16/25 bar / 230/360 psi | Gas content up to 70% | Liquid position below or above the pump | Corrosion pH from 0 to 14 |
|-------------------------------------|---------------------------------|----------------------------------------|-----------------------|-----------------------------------------|---------------------------|
| Clean/slightly contaminated liquids | ●                               | ●                                      | ●                     | ●                                       | ●                         |
| Viscous liquids                     | ●                               | ●                                      | ●                     | ●                                       | ●                         |
| Fibrous slurries                    | ●                               | ●                                      | ●                     | ●                                       | ●                         |
| Light/medium slurries               | ●                               | ●                                      | ●                     | ●                                       | ●                         |
| Liquids with large solids           | ●                               | ●                                      | ●                     | ●                                       | ●                         |

# Continuous research and development

Through revolutionary methods, we have continuously improved the performance and reliability of our pumps. Here at Sulzer, we place great emphasis on innovation and, research and development. Using our own simulation tools, we can quickly analyze various hydraulic designs and test the final design options in real operational conditions at our full-scale laboratory.

## Sulzer offers

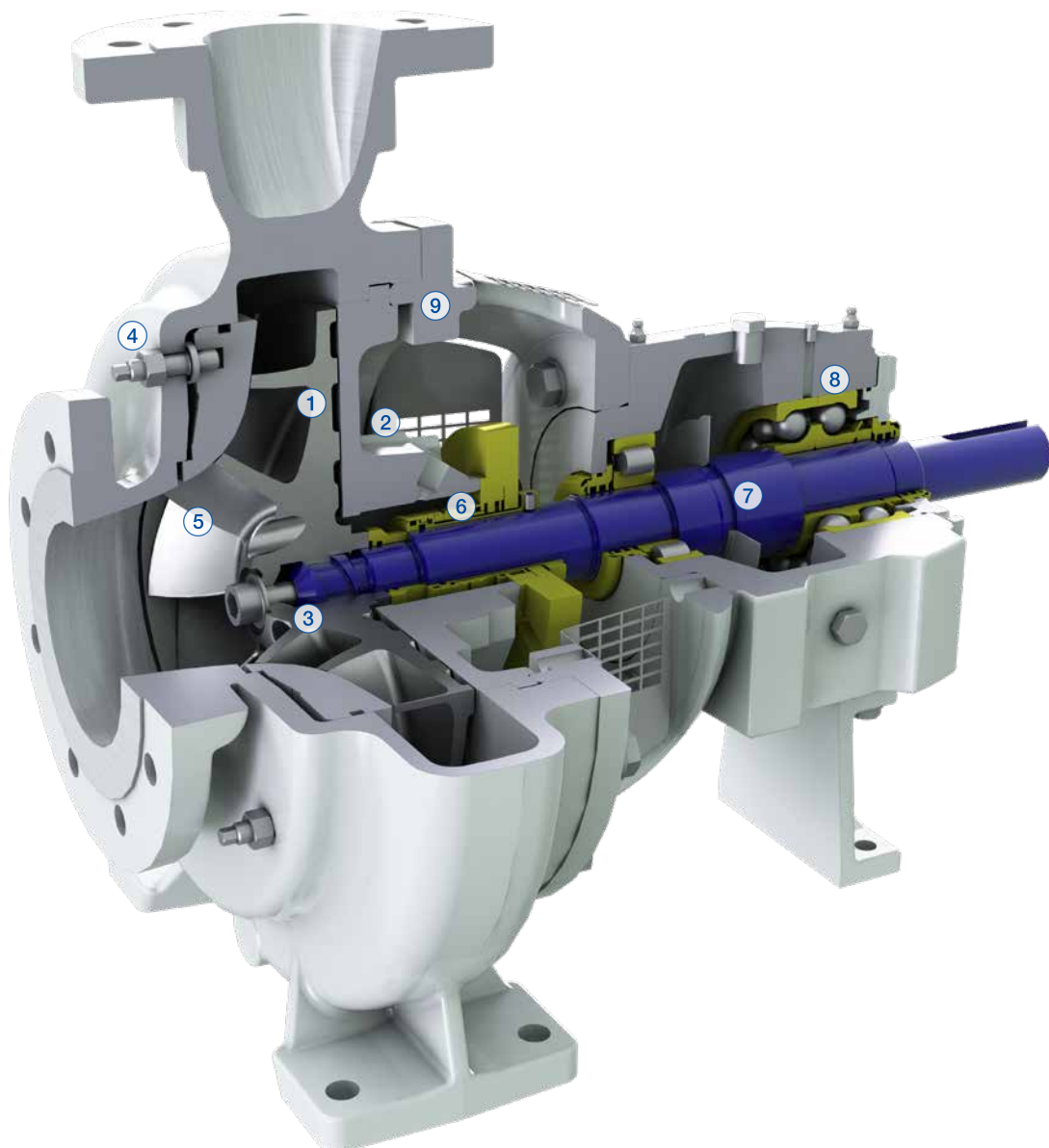
- Process knowhow and proven equipment knowledge
- Wide process and application coverage
- Excellent equipment performance through continuous equipment development
- Wide range of installations across many process industries
- Extensive installed base and reference list
- Optimized selections and guidelines
- Superior reliability due to high number of test runs in laboratory and various industries



# Superior design minimizes life cycle costs

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- ① Versatile range of reliable and efficient impellers
- ② Innovative and reliable integrated degassing and self-priming units
- ③ Robust, reliable Rotokey impeller mounting based on an original patented design
- ④ Externally adjustable side plate
- ⑤ Innovative balancing holes
- ⑥ Wide variety of shaft seal options
- ⑦ Heavy-duty shaft
- ⑧ Reliable bearing unit
- ⑨ Back pull-out design



# Features and benefits

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## Versatile range of reliable and efficient impellers

- Reduces life cycle costs, energy consumption, operation time and downtime

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## Externally adjustable side plate

- Allows fast and simple impeller clearance setting, thereby minimizing life cycle costs and ensuring continued high efficiency

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## Heavy-duty shaft

- Reduces deflection at stuffing box to <0.05 mm / 0.002 in
- Helps extend shaft seal lifecycle, reduces unexpected shutdowns and maintenance costs

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## Innovative and reliable integrated degassing and self-priming units

- For a variety of applications with difficult liquids
- Designed to help the centrifugal pump start quickly when the liquid level is below the pump in self-priming applications

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## Innovative balancing holes

- Ensure efficient liquid circulation behind the impeller and in the seal chamber
- Optimizes shaft seal performance
- Reduces unexpected shutdowns and minimizes operating and maintenance costs

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## Reliable bearing unit

- Reliable, heavy-duty bearing unit minimizes maintenance costs
- Includes oil and grease lubrication for all performance needs: grease lubrication for applications up to 120°C / 250°F; and oil lubrication for up to 180°C / 355°F

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## Robust and reliable Rotokey impeller mounting

- Enables fast and simple dismantling and reassembly
- Helps minimize maintenance costs
- Based on an original patented design

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## Wide variety of shaft seal options

- Effective dynamic, single and double mechanical seals and gland packing
- Fast and simple installation

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## Back pull-out design

- Facilitates quick access for servicing



# A range Peak performance process pumps for demanding applications

AHLSTAR A end-suction single-stage centrifugal process pumps are used for demanding industrial applications to ensure process reliability, high efficiency and low operating costs. US-customized version also available.

## Impeller options



Low-flow  
impeller



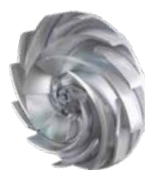
Open impeller



Special open  
impeller



Vortex impeller



Low-pulse  
impeller

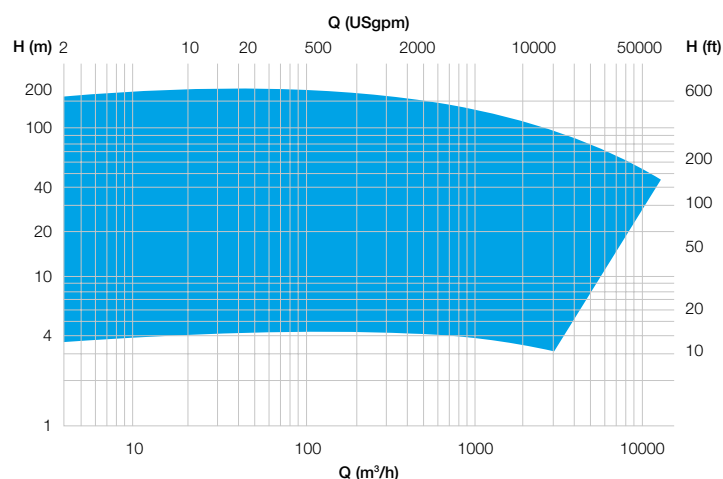


Closed impeller

## Operating data

|                                             | SI units                 | US units     |
|---------------------------------------------|--------------------------|--------------|
| Capacities                                  | 11'000 m <sup>3</sup> /h | 48'400 USgpm |
| Heads                                       | 160 m                    | 525 ft.      |
| Temperatures                                | 180°C                    | 356°F        |
| Pressures<br>depending on material and size | 16/25 bar                | 230/360 psi  |

## Performance range



# APT range High performance process pumps for demanding applications

AHLSTAR APT end-suction single-stage centrifugal process pumps are used for demanding industrial applications to ensure process reliability, high efficiency and low operating costs.

## Impeller options



Closed impeller



Open impeller



Special open impeller

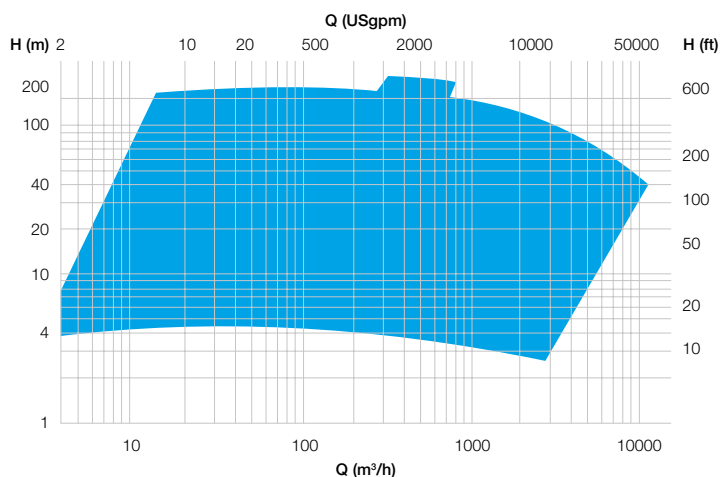


Low-pulse impeller

## Operating data

|                                             | SI units                | US units     |
|---------------------------------------------|-------------------------|--------------|
| Capacities                                  | 9'000 m <sup>3</sup> /h | 39'600 USgpm |
| Heads                                       | 160 m                   | 525 ft.      |
| Temperatures                                | 180°C                   | 356°F        |
| Pressures<br>depending on material and size | 16/25 bar               | 230/360 psi  |

## Performance range



# WPP/T range Tough against wear, gentle against process

AHLSTAR WPP/T wear-resistant end-suction single-stage centrifugal pumps are designed for abrasive and erosive pumping applications, such as lime milk and mud, and coating pigments.

## Impeller options



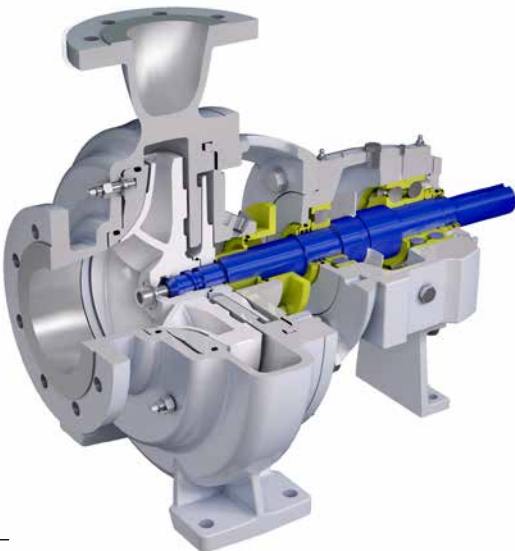
Wear-resistant closed impeller



Wear-resistant open impeller



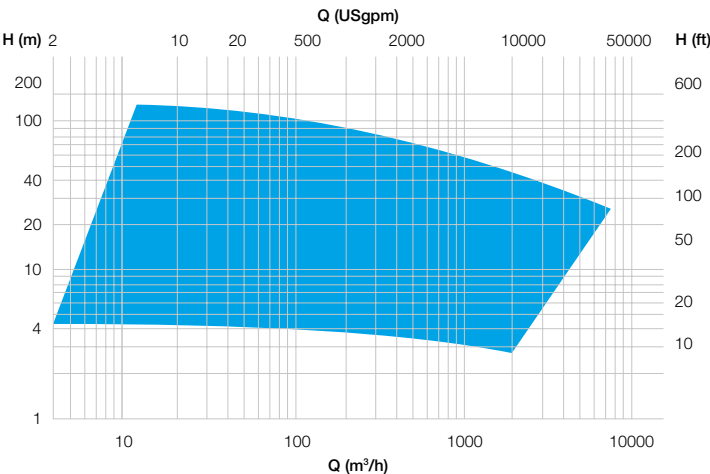
Wear-resistant vortex impeller



## Operating data

|                                             | SI units   | US units     |
|---------------------------------------------|------------|--------------|
| Capacities                                  | 7'000 m³/h | 31'000 USgpm |
| Heads                                       | 110 m      | 360 ft.      |
| Temperatures                                | 180°C      | 356°F        |
| Pressures<br>depending on material and size | 16 bar     | 230 psi      |

## Performance range

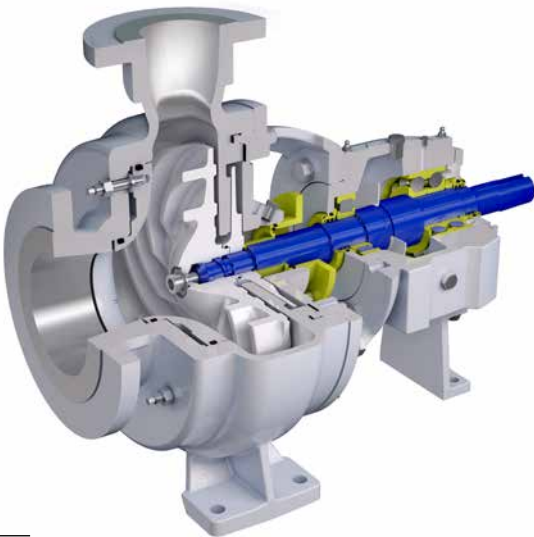


# NPP/T range

## Smooth solution for large solid particle pumping

AHLSTAR NPP/T non-clogging end-suction single-stage centrifugal process pumps are designed for industrial large solids containing liquid or abrasive slurry applications to avoid plugging.

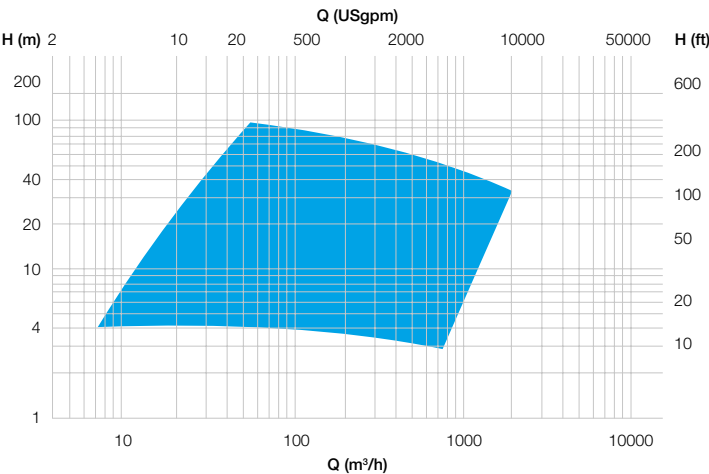
### Impeller options



### Operating data

|                                             | SI units                | US units    |
|---------------------------------------------|-------------------------|-------------|
| Capacities                                  | 2'000 m <sup>3</sup> /h | 8'800 USgpm |
| Heads                                       | 90 m                    | 295 ft.     |
| Temperatures                                | 180°C                   | 356°F       |
| Pressures<br>depending on material and size | 16 bar                  | 230 psi     |

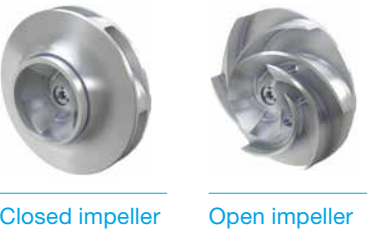
### Performance range



# EPP/T range Cool selection for hot liquid pumping needs

AHLSTAR EPP/T centerline supported end-suction single-stage centrifugal process pumps are designed to stand high temperature especially in demanding industrial hot liquid pumping applications.

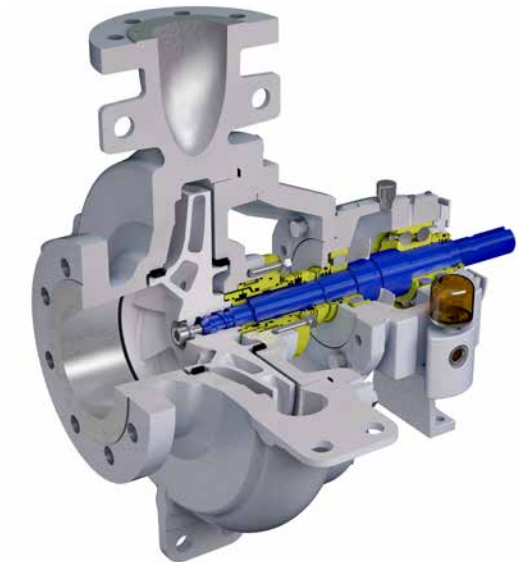
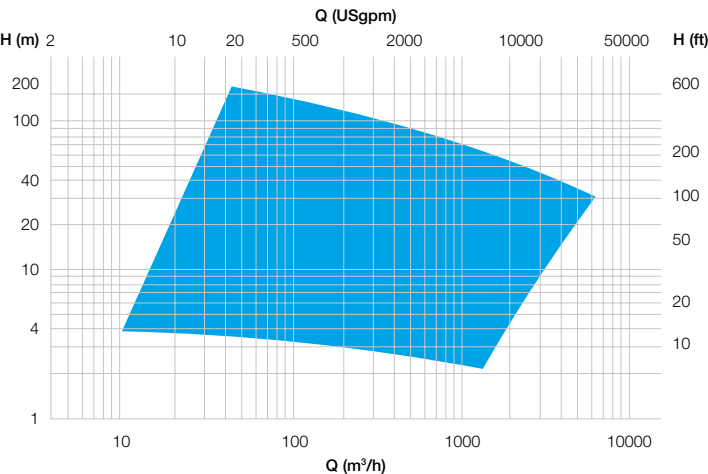
## Impeller options



## Operating data

|                                             | SI units   | US units     |
|---------------------------------------------|------------|--------------|
| Capacities                                  | 6'100 m³/h | 26'860 USgpm |
| Heads                                       | 160 m      | 525 ft.      |
| Temperatures                                | 210°C      | 410°F        |
| Pressures<br>depending on material and size | 25 bar     | 360 psi      |

## Performance range



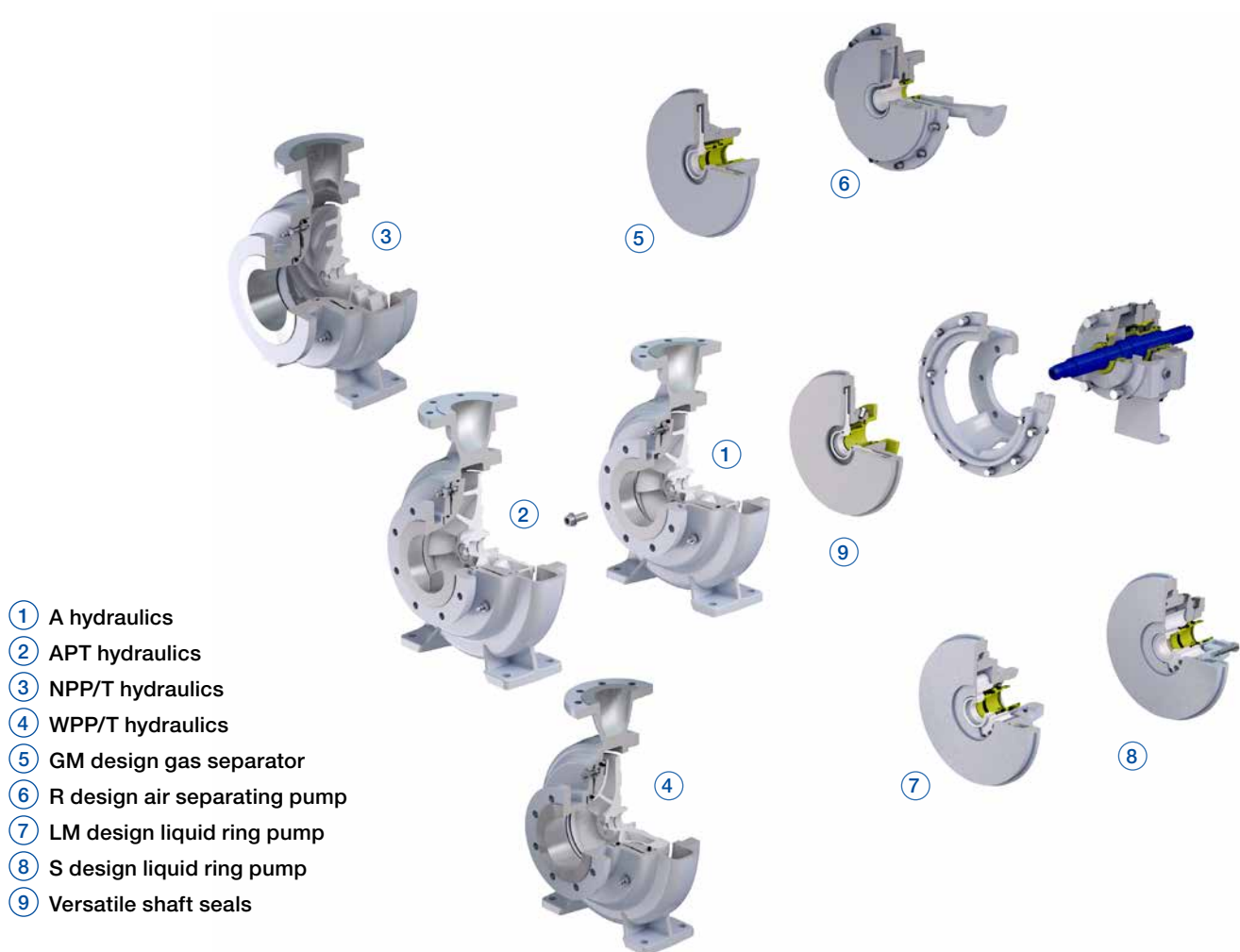
# Interchangeability

All pumps in our AHLSTAR range have been standardized, using common modules and components, for maximum interchangeability and easy installation and maintenance. Fewer parts means lower inventory costs and greater process reliability.

Common components and modules in AHLSTAR range types A, APT, EPP/T, NPP/T and WPP/T, with all options of gas separator GM, R, self-priming LM and S are:

- 173 wet end sizes
- 24 sealing unit sizes with 7 common shaft seal sizes
- 7 common bearing units
- Common sealing water equipment
- Common couplings and coupling guards
- Common baseplates

Lower spare part inventory and higher process reliability with high interchangeability of wet ends, sealing units and bearing units



# Materials

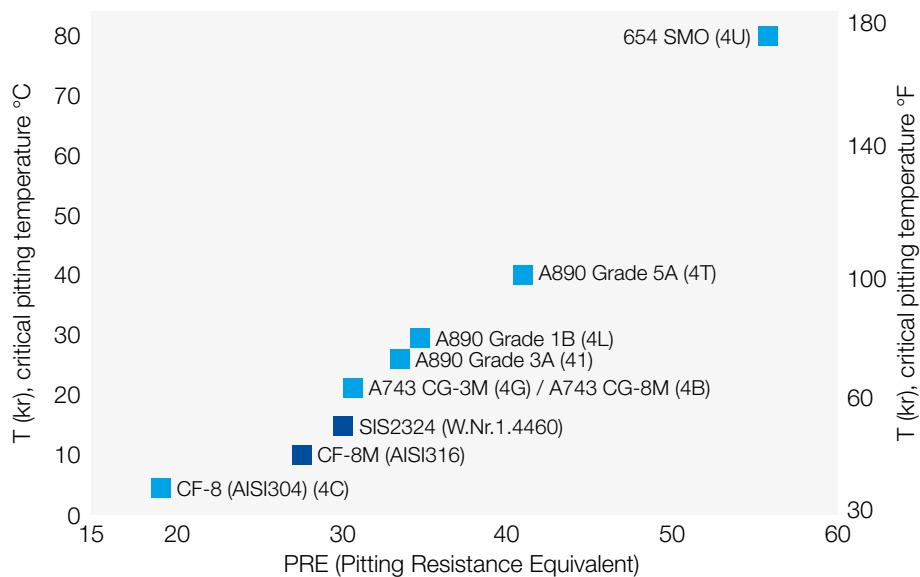
| Stainless steel design                               |                              |                  | Nominal chemical composition %                          |           |           |           |           |                             |
|------------------------------------------------------|------------------------------|------------------|---------------------------------------------------------|-----------|-----------|-----------|-----------|-----------------------------|
|                                                      |                              |                  | C                                                       | Cr        | Ni        | Mo        | Cu        | N                           |
| Duplex                                               | ASTM A890 3A                 | 41               | 0.06 max.                                               | 24.0-27.0 | 4.0-6.0   | 1.75-2.5  | -         | 0.15-0.25                   |
|                                                      | ASTM A890 1B                 | 4L, EH*          | 0.04 max.                                               | 24.5-26.5 | 4.7-6.0   | 1.7-2.3   | 2.7-3.3   | 0.10-0.25                   |
|                                                      | ASTM A890 5A                 | 4T               | 0.03 max.                                               | 24.0-26.0 | 6.0-8.0   | 4.0-5.0   | -         | 0.10-0.30                   |
| Austenitic                                           | ASTM A743 CF-8               | 4C               | 0.08 max.                                               | 18.0-21.0 | 8.0-11.0  | -         | -         | -                           |
|                                                      | AVESTA 654 SMO <sup>2)</sup> | 4U               | 0.025 max.                                              | 23.0-25.0 | 21.0-23.0 | 7.1-7.5   | 0.3-0.7   | 0.45-0.55                   |
| Martensitic                                          | ASTM A747 CB7Cu-2            | 4E               | 0.07 max.                                               | 14.0-15.5 | 4.5-5.5   | -         | 2.5-3.2   | -                           |
| Ferritic                                             | ASTM A743 CC50 (mod)         | ER**             | 0.25-0.35                                               | 29.0-30.0 | 1.50-3.00 | 1.50-3.00 | 1.00-1.50 | 0.10-0.20                   |
| Carbon steel, cast and ductile iron, titanium design |                              |                  | C                                                       | Cr        | Ni        | Mo        | Cu        | Other                       |
| Cast iron <sup>3)</sup>                              | ASTM A48 CL 35 B             | 53               | -                                                       | -         | -         | -         | -         | -                           |
| Chromium iron <sup>4)</sup>                          | ASTM A532 IIIA               | 5B               | 2.0-3.3                                                 | 23.0-30.0 | 2.5 max.  | 3.0 max.  | 1.2 max.  | Si 1.5 max.                 |
| Ductile iron                                         | ASTM A395 60-40-18           | 5H***            | 3.0 min.                                                | -         | -         | -         | -         | Si 2.50 max.<br>P 0.08 max. |
| Carbon steel                                         | ASTM A216 WCB                | 46 <sup>1)</sup> | 0.30 max.                                               | 0.50 max. | 0.50 max. | 0.20 max. | 0.30 max. | Mn 1.0 max.<br>Si 0.6 max.  |
| Titanium                                             | ASTM B367 C-3                | 75 <sup>1)</sup> | -                                                       | -         | -         | -         | -         | -                           |
| Material alternatives for other parts                |                              |                  |                                                         |           |           |           |           |                             |
| Gasket material                                      | Reinz AFM34                  | Y6               | Used in temperature range -50°C/-58°F...+250°C/+482°F   |           |           |           |           |                             |
|                                                      | PTFE/Glass                   | 84               | Used in temperature range -190°C/-310°F...+240°C/+464°F |           |           |           |           |                             |
| O-ring material                                      | EPDM                         | 92               | Used in temperature range -50°C/-58°F...+150°C/+302°F   |           |           |           |           |                             |
|                                                      | FKM                          | 93               | Used in temperature range -20°C/-4°F...+200°C/+392°F    |           |           |           |           |                             |

- 1) Currently available on limited sizes
- 2) AVESTA 654SMO is a trademark owned by Outokumpu Stainless which has granted Sulzer licence to produce this material
- 3) Type NPP/T pumps
- 4) For WPP/T range (5B/4E and full 5B)

\* EH precipitation hardened to c. 300HB  
 \*\* ER for WPP/T range impeller and sideplate  
 \*\*\* Type A pumps

Other corrosion resistant cast steels available on request.

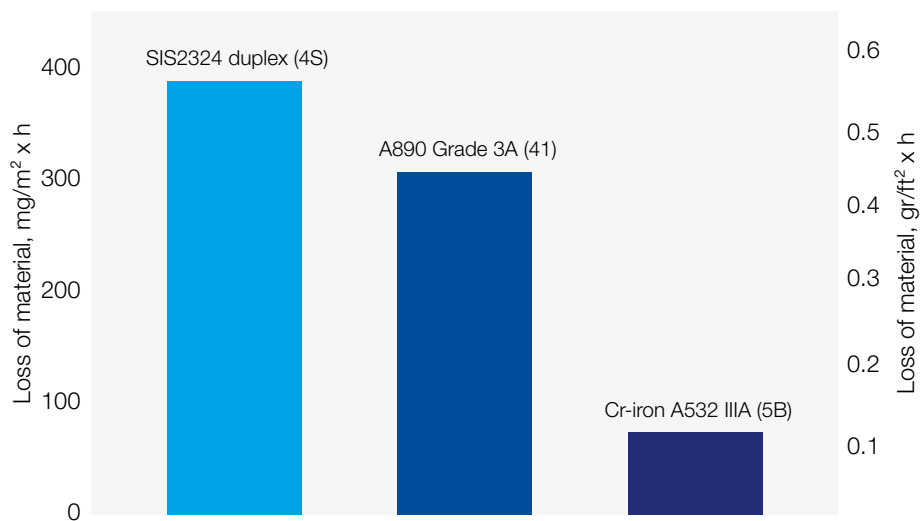




## Corrosion resistance

Ferric chloride solution test; ASTM G-48

■ typical other materials used in process industry (e.g. PPI)



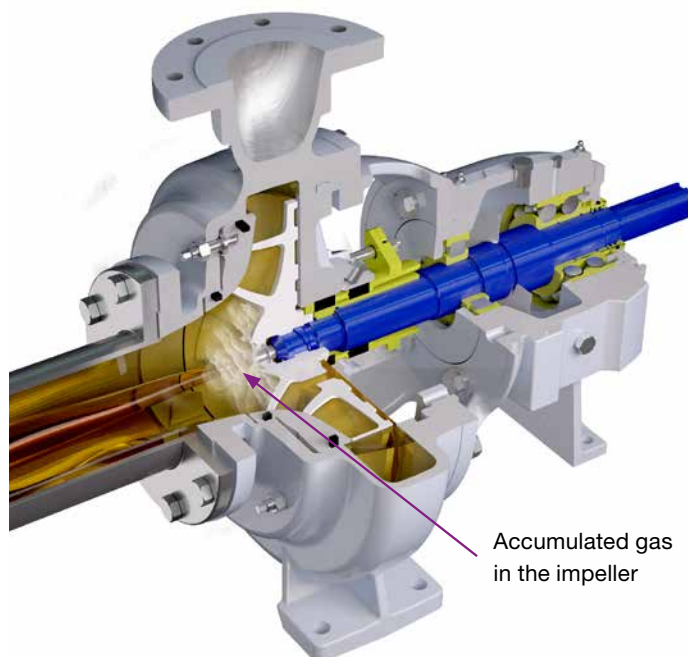
## Wear resistance

- Abrasion and corrosion test
- White liquor and lime mud +95°C/203°F ±22°C/40°F, 100 g/l/0.835 lb/gal quartz sand (Stora Enso Pulp)
- Accuracy in the test ±21 mg/m² x h / 0.03 gr/ft² x h

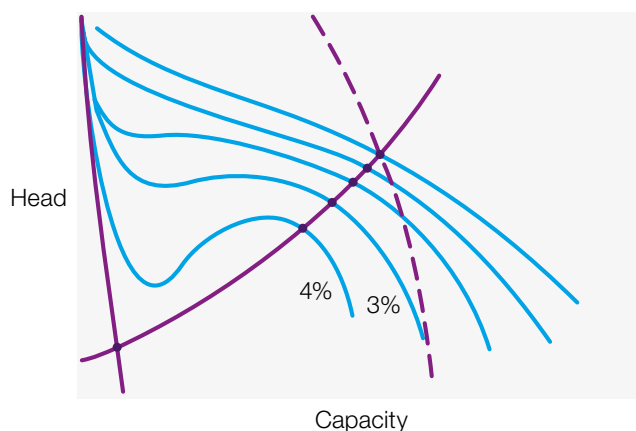
# Degassing and self-priming units

AHLSTAR pumps can be fitted with self-priming or degassing units, to enable the pump to be started with an empty inlet pipe and to allow it to pump liquids with high gas content.

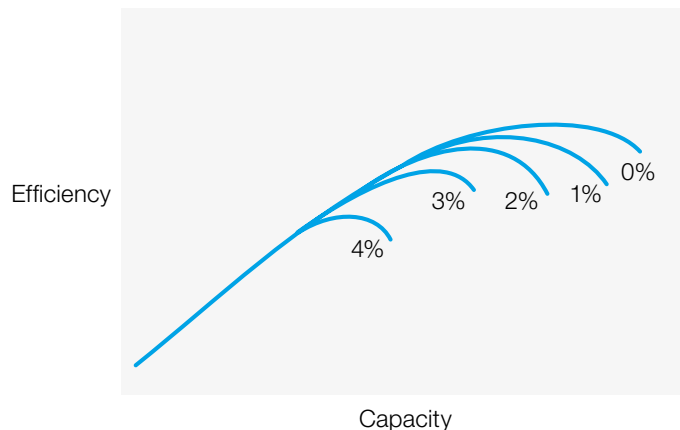
AHLSTAR degassing and self-priming units, the LM or S liquid ring pump and the GM or R gas separator units, stabilize the pumping of liquids containing up to 40% weakly bonded gases or up to 70% strongly bonded gases using centrifugal pumps.



Conventional centrifugal pumps, regardless of impeller type, can operate with a gas content of up to 4%. However, once the gas content exceeds 4%, bubbles start to accumulate in the impeller eye and impair operations. This reduces capacity and pumping becomes extremely unstable.

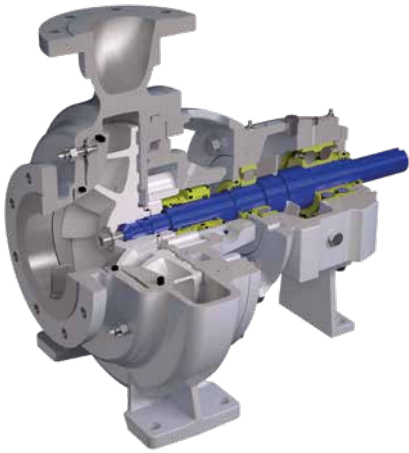


The difference in pressure between the pump inlet and the degassing unit outlet or the internal liquid ring pump eliminates gas bubbles from the impeller and thus stabilizes the system and significantly increases pump efficiency.

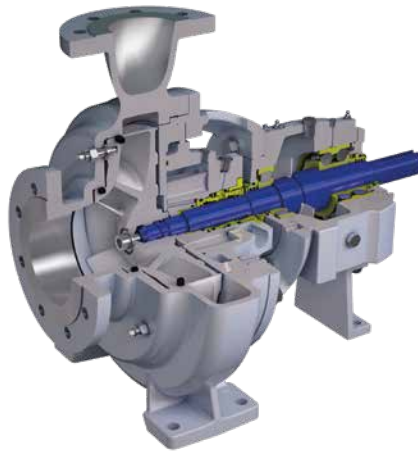


# Degassing and self-priming units

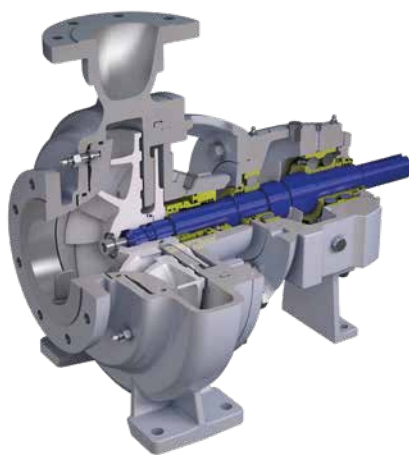
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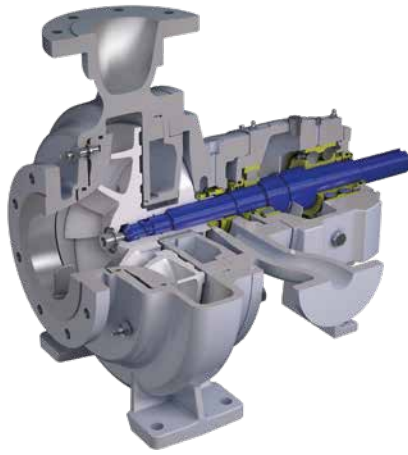
Liquid ring pump LM



Liquid ring pump S



Gas separator GM



Gas separator R

# Degassing and self-priming solutions

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## Positive inlet head

AHLSTAR pump with LM or S integrated liquid ring pump degassing unit

- For reliable pumping of gases containing liquids in unstable inlet head applications
- Single or double mechanical seal with recirculation flushing for clean liquids, or with external flushing for fibrous and light-to-medium slurries, and liquids containing large solids
- When the inlet head is stable, GM and R gas separator degassing units provide reliability and efficiency



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## Low or negative inlet head

AHLSTAR pump with LM or S integrated liquid ring pump

- Most reliable system for pumping gases containing liquids in low or negative inlet head applications
- Single or double mechanical seal with external flushing for clean liquids, fibrous and non-fibrous slurries, light-to-medium slurries, and liquids containing large solids
- Double mechanical seal with recirculation flushing for clean liquids
- GM or R gas separator degassing units without external vacuum pump cannot be used due to low or negative inlet head



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## Replacing the barometric leg

AHLSTAR pump with a GM or R gas separator unit

- Simplifies expensive classic barometric leg pumping systems and ensures consistent and reliable operation
- Deep wells, high buildings and long pipes with vertical or submersible pumps and liquid level control systems can be avoided, thereby minimizing initial costs
- Single mechanical seal with recirculation flushing for clean liquids or with external flushing for slurries
- Double mechanical seal for slurries

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## Self-priming pump applications

AHLSTAR pump with the LM or S integrated liquid ring pump degassing unit

- Ensures fast, reliable pump start-up and constant operation when starting with an empty inlet pipe
- Single mechanical seal with recirculation flushing for clean liquids, requires gooseneck inlet pipe
- Single mechanical seal with external flushing for slurries and liquids containing large solids





# Shaft seals

Shaft seal need to be selected carefully according to pumped liquid and operational conditions. With optimal seal selection you can maximize the lifetime of the seal and ensure reliable operation.

We have developed innovative Sulzer mechanical shaft seals for maximizing operational reliability and minimizing downtime costs. As Sulzer shaft seals require little or no water, they minimize also environmental costs.

Innovative impeller balancing holes together with optimized impeller back vanes improve liquid circulation and create ideal conditions in the seal chamber.



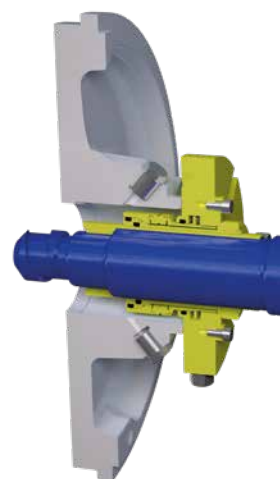
## Ready-fitted mechanical seals

- Suitable for clean or viscous liquids and liquids containing large solids
- More space in seal chamber because no shaft sleeve needed
- Strong and solid design
- Single and double seal options



## Integrated mechanical seals

- Suitable for clean or viscous liquids and liquids containing large solids
- More space in seal chamber because no shaft sleeve needed
- Strong and solid design
- Single and double seal options



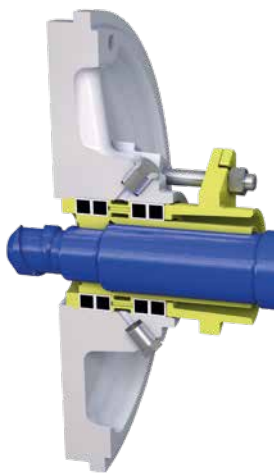
## Cartridge mechanical seals

- Suitable for clean or viscous liquids and liquids containing large solids
- Single and double seal options



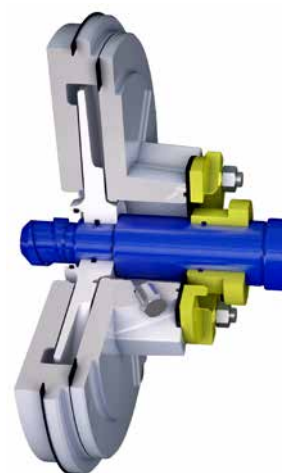
### Standard element mechanical seals

- Requires shaft sleeve and seal housing
- Standard dimensions (L1K) for seals
- Suitable only for light-duty applications, e.g. clean liquids, low pressure, low temperature
- Single and double seal options



### Gland packing

- Designed in accordance with ISO dimension standards
- Requires a sleeve to protect the shaft from corrosion and wear
- Reliable operation, but small (50 drops/minute) leakage required by seal/sleeve lubrication
- Easy maintenance, without having to open the pump, due to a split gland design



### Sulzer dynamic seal

- Suitable for clean liquids, viscous or non-fibrous slurries and liquids containing large solids
- No external sealing water required
- For applications with positive pump inlet head and a temperature below boiling point in atmospheric pressure

# Sealing water equipment

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Sealing water equipment regulates the volume and pressure of external sealing water for optimum pump performance. The equipment is attached directly to the supply connection using a hose or pipe/tube.



## Automatic constant flow sealing water equipment

- For single/double mechanical seals and gland packings
- Supply pressure  $\geq 0.5$  bar / 7 psi above seal chamber pressure
- Automatic flow control 2 l/min / 0.5 USgpm



## Classic adjustable sealing water equipment

- Suitable for single/double mechanical seals and gland packings
- Requires water supply pressure 0.5 bar / 7 psi above seal chamber pressure
- Adjustable sealing water flow typically 3–5 l/min / 0.8–1.3 USgpm



## Sulzer integrated smart flow sealing water equipment

- For double mechanical seals
- Minimizes sealing water consumption
- Supply pressure  $\geq 0.5$  bar / 7 psi above seal chamber pressure
- Up to 90% water savings vs. standard sealing water systems
- Seal chamber venting required before operation

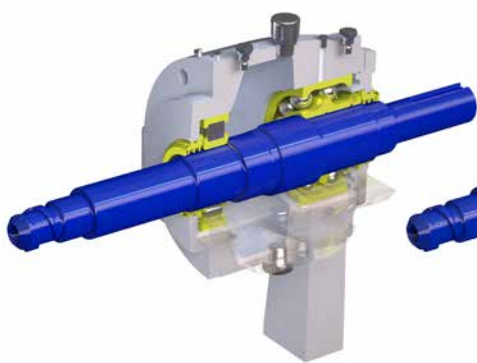
## Sulzer SP15 seal pot

- For pressurized and unpressurized double mechanical seals with pumping feature
- Closed-loop circulation for lubrication, cooling, and dry-run protection
- Suitable for water, glycol-water mixtures, and white oil
- Max. pressure 16 bar / 232 psi
- Max. process temperature 120°C / 248°F (air cooled), 170°C / 338°F (water cooled)
- 15 l / 3.96 US gal reservoir
- Compatible with Sulzer and other double mechanical seals
- Up to 96% water savings compared to conventional sealing water systems

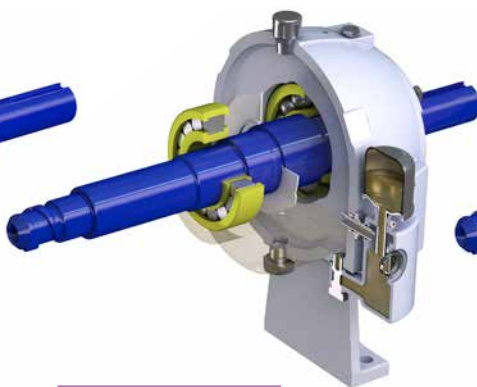
# Heavy-duty bearing units

Sulzer's AHLSTAR bearing units are reliable and heavy-duty, resulting in minimized maintenance costs.

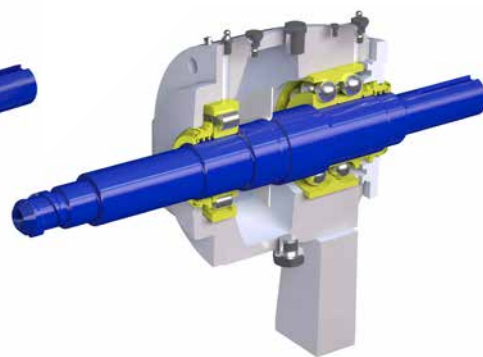
- Optimized construction, making assembly fast and simple
- Heavy-duty shaft minimizes deflection at stuffing box < 0.05 mm / 0.002 in, thereby extending the life cycle of the shaft seal
- Oil bath or oil splash lubrication for applications up to 180°C / 355°F and grease lubrication up to 120°C / 250°F
- The strong, over-sized bearing design far exceeds the ISO 5199 standard life cycle of 17'500 hours
- A sturdy support foot provides a solid base and prevents coupling alignment changes



Oil bath lubrication



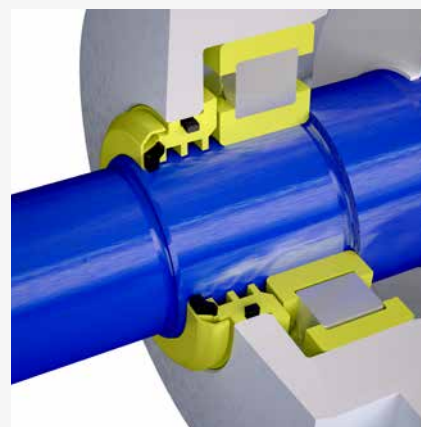
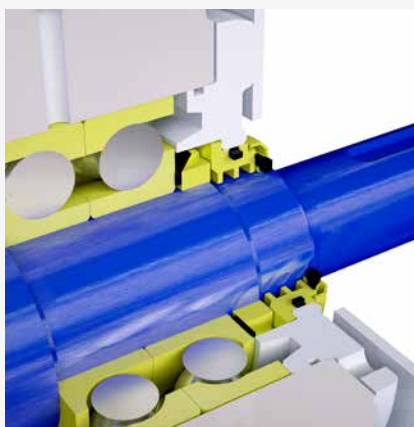
Oil splash lubrication



Grease lubrication

## Innovative bearing isolators

Sulzer's innovative, non-contacting bearing isolators at the both ends of the bearing house consist of three elements: a deflector, a lip seal and a labyrinth. This triple bearing protection prevents lubricant leaks from the bearing house and keeps contaminants out. No contact between the lip seal and shaft when the pump is rotating also means no wear, which extends the lifecycle of the unit.



# Baseplate options

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## Standard T-frame baseplates

- The purpose of the baseplate is to facilitate installation of the pump-motor combination at the installation site
- The robust and rigid baseplate supports the substantial load of the piping and drive motor
- Galvanized riser blocks as standard enable installation of the next size of drive motor frame, when required
- Stainless steel alignment blocks as standard facilitate fast and simple adjustment of the motor when aligning the coupling
- Alternative foundation bolts available, depending on application (welded, grouted or chemical anchors)



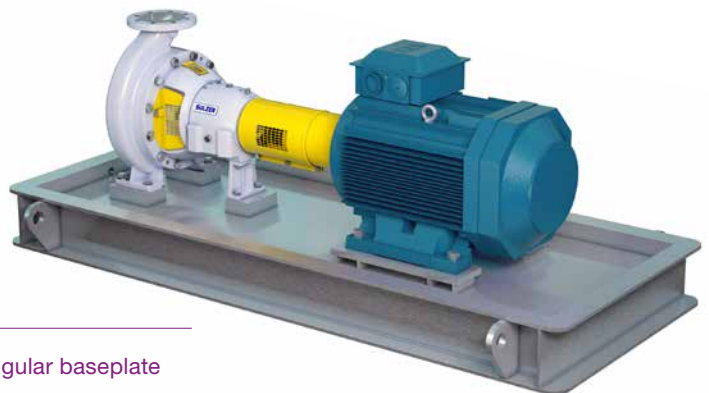
Standard T-frame baseplate

## Heavy-duty and API rectangular baseplates

- Heavy-duty and API standard rectangular baseplates are grouted into the concrete foundation
- Possible leaks are collected on the baseplate or drip pan
- Stainless steel alignment blocks as standard facilitate fast, simple adjustment of the motor when aligning the coupling
- Alternative foundation bolts available, depending on application (grouted, welded, bonded, or anchor plate mounted)



Heavy-duty baseplate



API rectangular baseplate

# Instrumentation and monitoring

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## Versatile measurement options

- Bearing temperature
- Bearing vibration
- Liquid temperature
- Pressure

## Junction box options

- Wired or with transmitter

## Pressure gauge panels

- Analog gauges, transmitter option available

## Enhance data-driven maintenance with condition monitoring

Sulzer Sense offers visibility into equipment condition, helping to prevent failures, reduce downtime, lower maintenance costs, and make confident, data-based decisions. With continuous equipment monitoring, issues can be detected early, and common risks such as unexpected breakdowns, lack of predictive insights, and limited on-site resources can be promptly addressed.

Sense continuously measures pump vibration and temperature, providing data for trend analysis, anomaly detection, and troubleshooting. The system includes sensors, gateways, and a portal.



Choose the right Sulzer Sense package for your needs at [sulzer.com/sense-condition-monitoring](https://sulzer.com/sense-condition-monitoring)

# Surface treatment options

## Internal surface treatment

- Standard surface cleaning for normal applications
- Ground Ra 6.3 surfaces
- Cotton ball tested surfaces
- Cleaning for drinking water and food contact applications (ACS and EC1935)
- Special inside surface treatment on request

## External surface treatment

- ISO 12944-2 C4 EPZn[R]/EP painting for corrosive atmospheres
- ISO 12944-2 C4 ESiZn[R]/SI\* painting for high temperatures >150°C / 300°F applications
- ISO 12944-2 C5 EPZn[R]/EP\*\* painting for aggressive atmospheres
- Special external treatment available on request

\* ESiZn[R]/SI = zinc-rich ethyl-silicate paint / silicon aluminium paint

\*\* EPZn[R]/EP = 2-pack zinc-rich epoxy paint / 2-pack epoxy paint



# Tests and certification options

## Performance tests

- Capacity, head, efficiency and NPSHr tests in accordance with ISO 9906 / HI 14.6
- Noise tests
- Vibration test in accordance with ISO 5199 / ISO 10816-7, Category II
- Mechanical tests in accordance with HI 14.6
- Pressure pulsation test

## Material and NDT tests

- EN 10204.2.2 and 3.1
- Liquid penetration in accordance with ISO 1371-1 level 3
- Magnetic particle examination in accordance with ISO 1369 level 3
- PMI positive material identification
- Food Contact Materials Regulation EC 1935/2004
- ACS drinking water certification

## Structural tests

- Balancing of impellers in accordance with ISO 21940-11 grade 6.3 and 2.5
- Hydrostatic pressure test in accordance with ISO 5199

## Inspection of assembly

- Dimensional checking of installation
- Dimensional checking of clearances
- Paint film thickness checking
- Final assembly checking

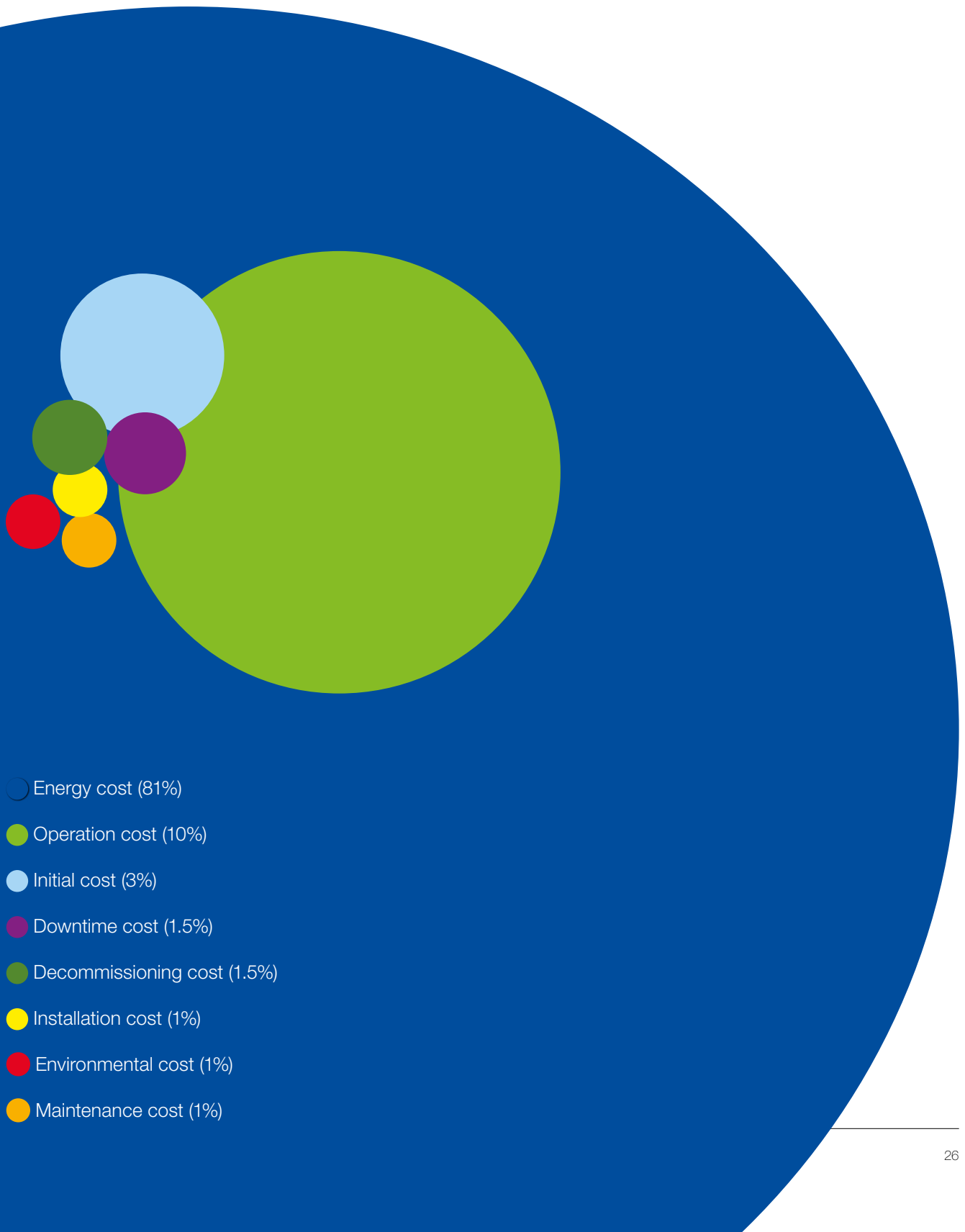
Customized tests available on request.

# Standards and directives

|                             |                                 |                                                                                                                                                                            |
|-----------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legislation</b>          | Directive 2006/42/EC            | Machinery directive                                                                                                                                                        |
|                             | Directive 93/68/EEC             | CE Marking                                                                                                                                                                 |
|                             | Directive 2014/34/EU            | Equipment and Protective systems intended for use in Potentially Explosive Atmospheres (ATEX)                                                                              |
|                             | Regulation (EC)<br>No 1935/2004 | Materials and articles intended to come into contact with food                                                                                                             |
| <b>Product safety</b>       | EN 809 +<br>A1:2009/AC:2010     | Pumps and pump units for liquids<br>- Common safety requirements                                                                                                           |
|                             | ISO 12100                       | Safety of machinery<br>- General principles for design. Risk assessment and risk reduction.                                                                                |
|                             | ISO 80079-36                    | Non-electrical equipment for explosive atmospheres.<br>Basic method and requirements                                                                                       |
|                             | ISO 80079-37                    | Non-electrical equipment for explosive atmospheres.<br>Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k". |
| <b>Quality system</b>       | EN ISO 9001                     | Quality management systems. Requirements.                                                                                                                                  |
| <b>Environmental system</b> | ISO 14001                       | Environmental management systems<br>- Requirements with guidance for use                                                                                                   |
|                             | ISO 45001                       | Occupational health and safety management systems.<br>- Requirements with guidance for use                                                                                 |
| <b>Dimensions</b>           | ISO 2858                        | End-suction centrifugal pumps (rating 16 bar)<br>- Designation, nominal duty point and dimensions<br>(up to size 44-200) (not for EPP)                                     |
| <b>Design</b>               | EN ISO 5199                     | Technical specifications for centrifugal pumps – Class II                                                                                                                  |
| <b>Testing</b>              | ISO 9906<br>HI 14.6             | Rotodynamic pumps<br>- Hydraulic performance acceptance tests<br>- Grades 1E and 1B (pump type A)<br>- Grade 2B (pump type A, NPP, WPP, EPP)                               |
|                             | EN 10204                        | Metallic products<br>- Types of inspection documents<br>- Inspection document type 2.2<br>- Inspection document type 3.1                                                   |
|                             | EN 735                          | Overall dimensions of rotodynamic pumps. Tolerances.                                                                                                                       |
|                             | ASME B16.1                      | Grey iron pipe flanges and flanged fittings Class 25, 125, 250<br>- Class 125                                                                                              |
| <b>Flange drilling</b>      | ASME B16.42                     | Ductile iron pipe flanges and flanged fittings<br>- Class 150, 300                                                                                                         |
|                             | ASME B16.5                      | Pipe flanges and flanged fittings NPS ½ through NPS 24<br>- Class 150, 300                                                                                                 |
|                             | JIS B 2220                      | Steel pipe flanges - 10K, 16K, 20K, 30K                                                                                                                                    |
|                             | JIS B 2239                      | Cast iron pipe flanges - 10K, 16K                                                                                                                                          |
|                             | EN 1092-1                       | Flanges and their joints<br>- Part 1: Steel flanges<br>- PN10, PN16, PN25                                                                                                  |
|                             | EN 1092-2                       | Flanges and their joints<br>- Part 2: Cast iron flanges<br>- PN10, PN16                                                                                                    |

# Typical distribution of Total Cost of Ownership (TCO)

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# Your partner for long-term reliability

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At Sulzer, we are committed to ensuring the long-term success and optimal performance of your AHLSTAR process pumps. Our comprehensive service and support offerings are designed to provide peace of mind and maximize your investment.

Experience reduced downtime, maximized operational efficiency, and extended service life with our easy-to-maintain pumps and expert support.

## Unlock the full potential of your equipment

With 190 years of engineering expertise and operations in over 160 countries, we stand as your services partner. Sulzer is with you every step of the way from workshop repairs, field services, customer service agreements, and original spare parts to digital services ensuring the continuous quality you initially invested in. We are your long-term partner in performance.



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➤ **Contact us today:** [go.sulzer.com/flow-solution-services](https://go.sulzer.com/flow-solution-services)

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**The Sulzer Flow division keeps your processes flowing. Wherever fluids are treated, pumped, or mixed, we deliver highly innovative and reliable solutions for the most demanding applications.**

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The Flow division specializes in pumping solutions specifically engineered for the processes of our customers. We provide pumps, agitators, compressors, grinders, screens and filters developed through intensive research and development in fluid dynamics and advanced materials. We are a market leader in pumping solutions for water, oil and gas, power, chemicals and most industrial segments.

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