

sefco

CRYOGENIC pumps



sefco



© Various Sefco process pumps at a SIAD Macchine Impianti S.p.A. ASU in the Czech Republic

SEFCO
Swiss Engineering For
Cryogenic Operations

experience

With more than
5000
PUMPS
in operation
worldwide and
OVER 40
YEARS OF
EXPERIENCE,

Sefco is a leading manufacturer in the field of cryogenic equipment. Collaborating with long-term partners all over the world allows us to provide you with the support you expect.



We promote innovation and maintain a continuous dialogue with our customers to meet and exceed their expectations

© Hydran C-25/G2-H



BUILDING PARTNERSHIPS

We are determined to provide our customers with the best solutions and help them achieve superior productivity in their process by building partnerships and supporting them through all phases of the project.



Sefco AG (Headquarter)

- 📍 Located in Bottmingen, Switzerland
- 🕒 Established in 1978
- 📄 Engineering, R&D, Manufacturing, Performance Testing, Marketing, Sales, Service, Procurement, Quality Management
- ★ ISO 9001: 2015



Sefco-China Cryogenic Pump Company, LTD

- 📍 Located in Shanghai, China
- 🕒 Established in 2018
- 📄 Sales, Marketing, Service, Start-up, Maintenance, Commissioning, Spare Parts
- ★ ISO 9001: 2015



INNOVATION

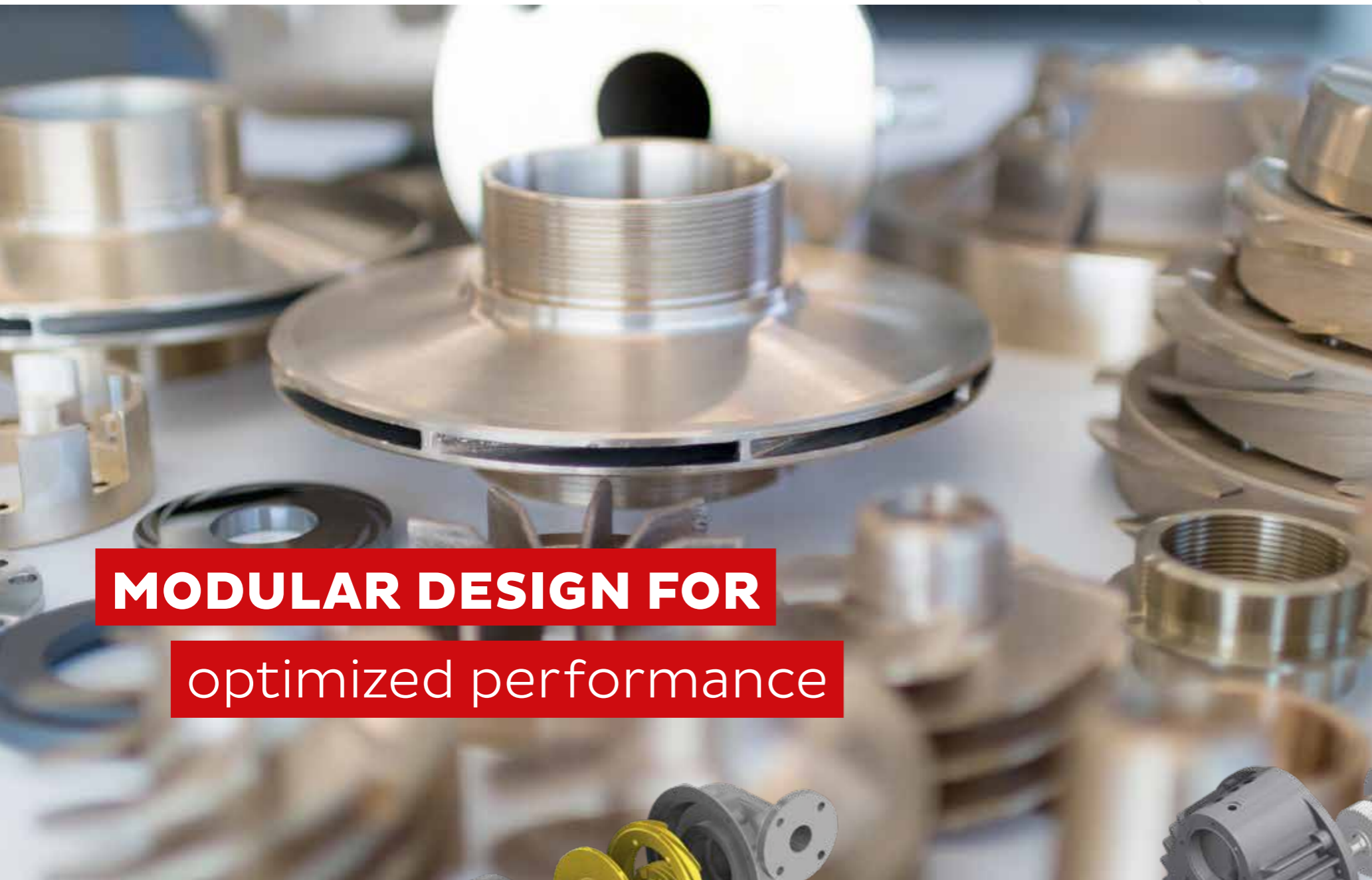
Innovation is crucial to the continuing success of any organization. Sefco's ingenious modular pump design allows for hundreds of different pump configurations while maintaining a reduced number of pump models. The continuous search for product and technology enhancements will guarantee our customers the very best products available on the market.



ADVANCEMENT OF CRYOGENIC

pump technology

Sefco's guiding principle is to advance the technology of cryogenic pumps for the industrial gas market. We offer a wide range of centrifugal and reciprocating pumps specifically designed for the production and distribution of liquefied air gases (LIN/LOX/LAR) as well as LCO2 and LNG.



© Various modular components

MODULAR DESIGN FOR

optimized performance

MODULARITY

One of the most characteristic aspects of Sefco's pump design is its modularity which provides hundreds of different pump configurations: each pump model can fit several impellers, inducers, diffusers and shaft seals, thus enabling to offer pumps which are optimized for the customer's applications. A modular gearbox with several possible ratios is also available for specific pump types. New components are regularly developed in order to match very specific customer needs, even for singularly unique units. This design philosophy makes Sefco the ideal partner to develop pumps for new cryogenic applications.



The cryogenic pump has to adapt to the application of the customer. At Sefco, we adhere to this fundamental rule by using interchangeable individual pump components. Thereby the housing remains unchanged while the internal parts are selected accordingly to meet the customer's requirements.

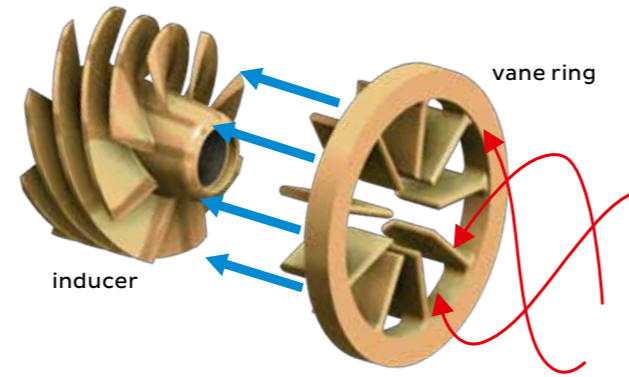


DESIGN PHILOSOPHY

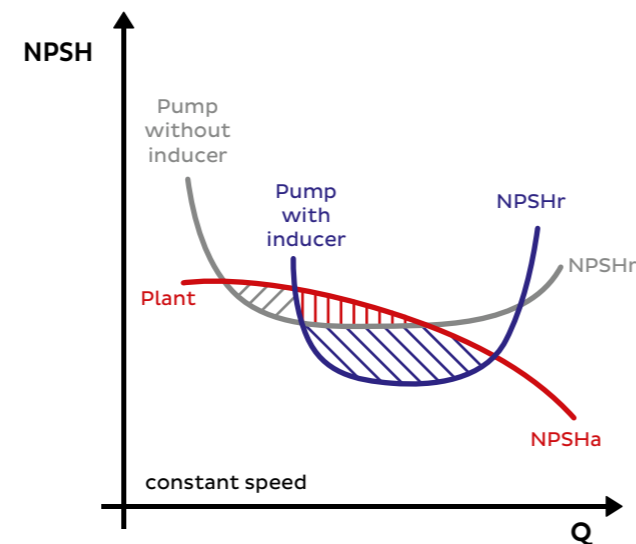
Sefco offers a wide range of centrifugal and reciprocating pumps specifically designed for the production and distribution of cryogenic liquids such as LIN, LOX, LAR, LCO2 and LNG. A compact and lightweight design provides optimal performance without any compromises regarding safety and reliability. All pumps are designed and assembled according to the latest standards for oxygen service, irrespectively of from their actual application (oxygen service or not).

INDUCER technology

Sefco's centrifugal pumps (single and multi-stage) can be fitted with an inducer in order to improve their suction performance, consequently providing more stable and reliable operation.

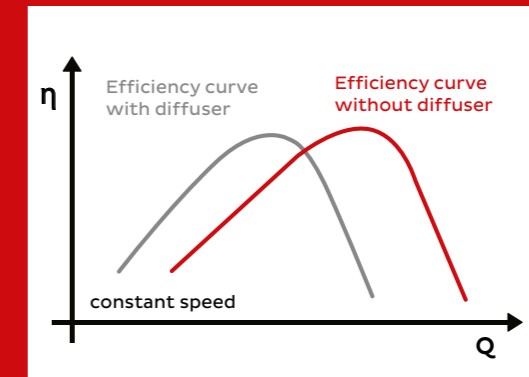
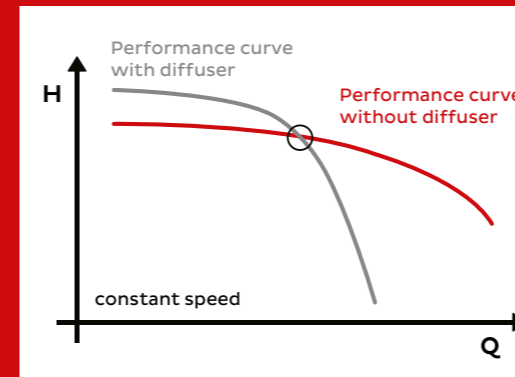


The use of an inducer at the pump inlet enables to lower the Net Positive Suction Head (NPSH) required by the pump. For each pump size, several inducers are available. The inducer type is chosen according to the flowrate range of the application in order to provide the best suction performance. A vane ring is integrated into the suction flange prevents rotation of the liquid (swirl) in the suction pipe and ensures that the inducer is operating under ideal conditions.



DIFFUSER technology

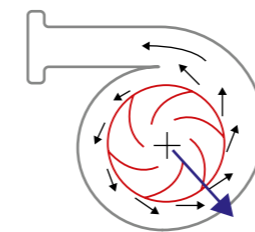
All high pressure centrifugal pumps (including multi-stage pumps) are fitted with diffusers which provide several advantages regarding efficiency and reliability.



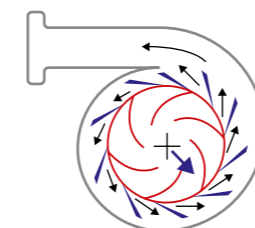
The diffuser increases the pressure between the impeller and the pump outlet. In addition to the increase in pump efficiency and the possibility to adapt the performance curve, this technology reduces the bearing loads due to a uniform distribution of the pressure on the impeller. Several diffuser sizes are available for each pump type, thus enabling to meet a very wide range of applications.



© Various modular components



No diffuser: high radial forces on the shaft (non-uniform pressure distribution on the impeller)



Axial diffuser technology: very low radial forces on the shaft (uniform pressure distribution on the impeller)

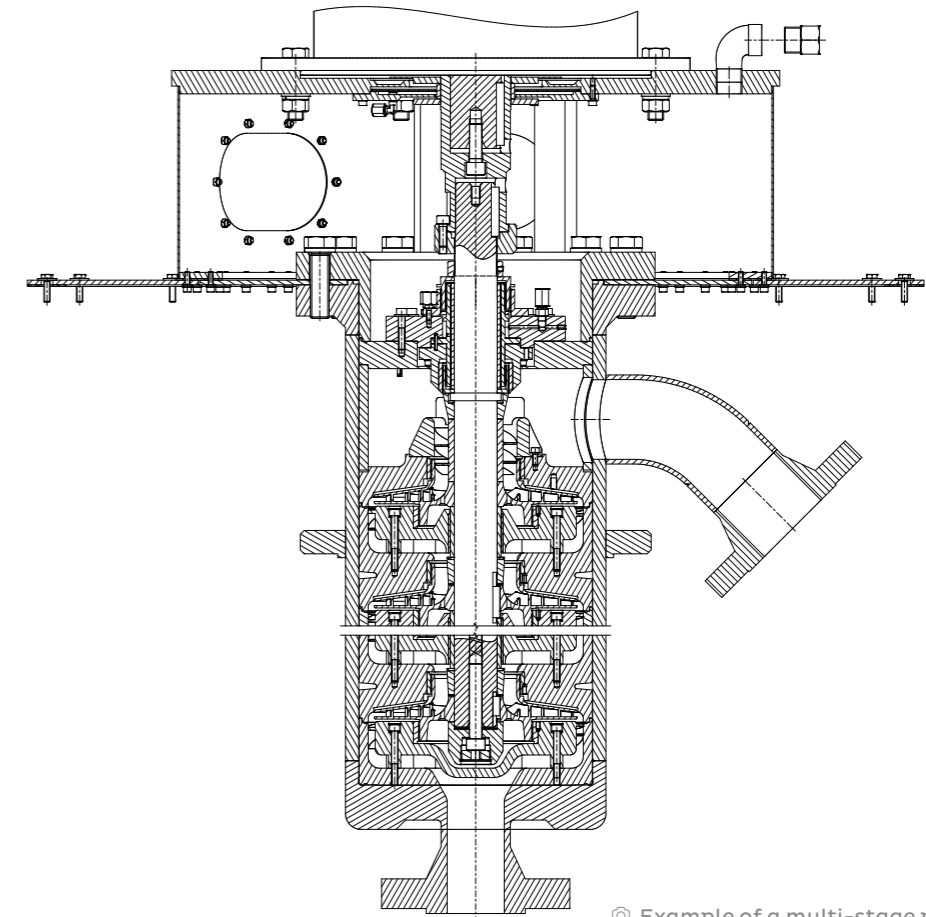


«
At SEFCO, we use qualified suppliers only to guarantee the highest quality and reliability for all our products
»

PROCESS

applications

© Various Sefco process pumps at a SIAD Macchine Impianti S.p.A. ASU in the Czech Republic



© Example of a multi-stage process pump

Sefco's process pumps cover a wide range of pressures and flowrates as a result of its modular design. The performance of each pump is specially adjusted to meet specific requirements. As a result of the various components available for each pump model, the pump operating parameters can be set to provide maximum performance without compromising the reliability.

Sefco's engineers stay at customer's disposal for customized solutions including skids, cold-box flanges, etc. The process pumps (single or multi-stage) can be fitted with all the usual options and accessories such as purge systems, cooldown and leakage survey, dry-run protection and motor bearing and winding temperature monitoring. In case of special applications outside the standard product portfolio, Sefco's research and development department is ready to design new components, pumps or related systems.

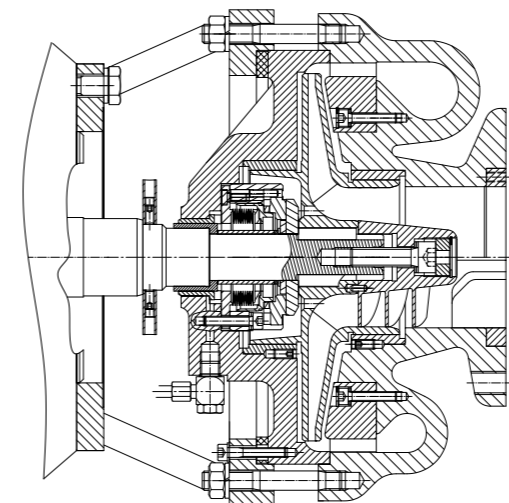
PRODUCTS

- Horizontal or vertical single-stage pumps with labyrinth or gas riding seal
- Vertical multi-stage pumps with labyrinth seal
- Reciprocating pumps
- LIN/LOX/LAR/LCO2/LNG



DISTRIBUTION
applications

Sefco offers a wide variety of centrifugal and reciprocating pumps specifically developed for the transfer of LIN/LOX/LAR, LNG and LCO2. All pumps have been designed and manufactured according to the Sefco pump principle (modular design) by selecting the optimal components to meet the requirements of the specific distribution application. The results are highly reliable and efficient pumps with a lightweight cold-end for fast cooldown and a high pressure/high flow performance for fast loading and unloading.



PRODUCTS

- ➔ Electric and hydraulic trailer pumps
- ➔ Transfer pumps
- ➔ Cylinder filling pumps
- ➔ LIN/LOX/LAR/LCO2/LNG



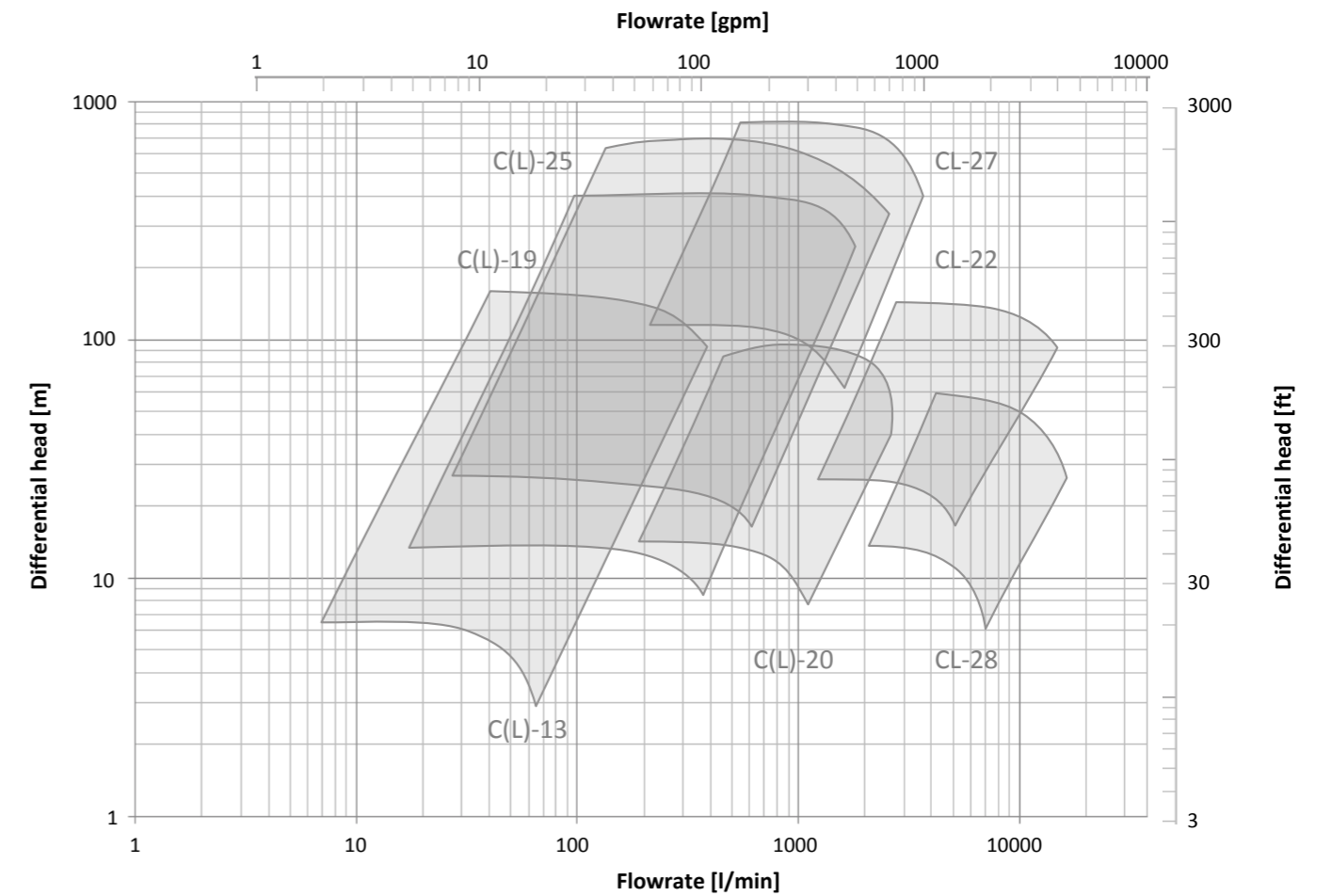
OUR PRODUCTS

for your application

SINGLE STAGE centrifugal pumps

SINGLE STAGE PUMPS

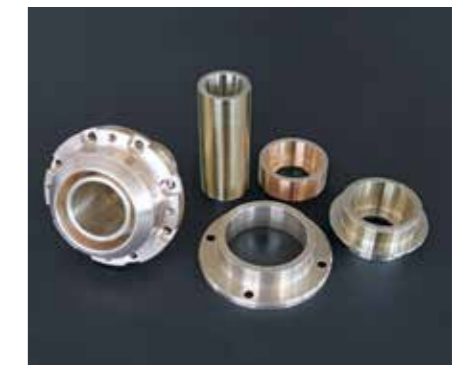
PUMP MODEL	SEAL SYSTEM			LIQUIDS PUMPED		
	GRD	GRS	Labyrinth	LIN/LOX/LAR	LCO ₂	LNG
DISTRIBUTION PUMPS						
C-19 Varan III	✓	✓		✓	✓	
C-19 Varan III+	✓	✓		✓	✓	
C-19 EM-7.5	✓	✓		✓	✓	✓
C-19 Hydran	✓	✓		✓	✓	✓
C-25 Hydran	✓	✓		✓	✓	✓
C-20	✓	✓		✓	✓	✓
SINGLE STAGE PROCESS PUMPS						
C(L)-13	✓	✓	✓	✓	✓	✓
C(L)-19	✓	✓	✓	✓	✓	✓
C(L)-20	✓	✓	✓	✓	✓	✓
CL-22			✓	✓		✓
C(L)-25	✓	✓	✓	✓	✓	✓
C(L)-25HF		✓	✓	✓		✓
CL-27			✓	✓		✓
CL-28			✓	✓		✓



Ⓢ Mechanical seal (GRD)



Ⓢ Gas riding seal (GRS)



Ⓢ Labyrinth seal

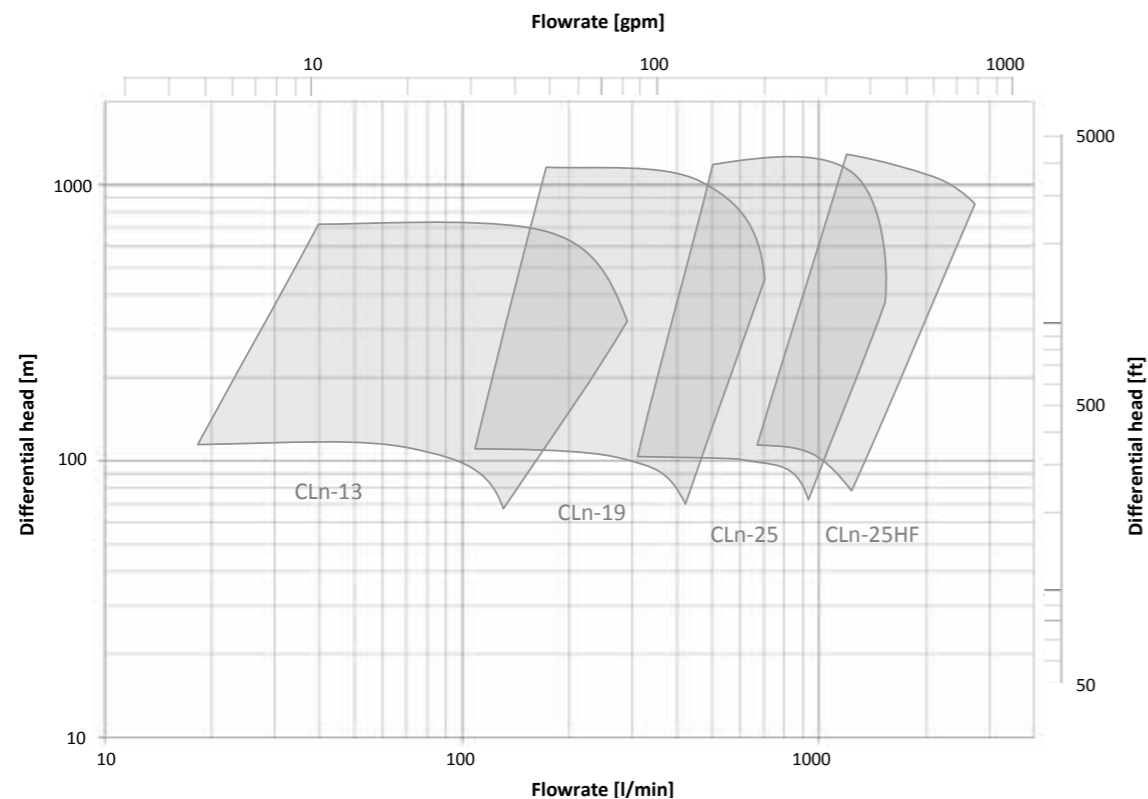
MULTI STAGE centrifugal pumps

MULTI STAGE PUMPS

PUMP MODEL	SEAL SYSTEM			LIQUIDS PUMPED		
	GRD	GRS	Labyrinth	LIN/LOX/LAR	LCO ₂	LNG

PROCESS PUMPS

CL(n)-13			☑	☑	☑	☑
CL(n)-19			☑	☑	☑	☑
CL(n)-25			☑	☑	☑	☑
CL(n)-25HF			☑	☑	☑	☑



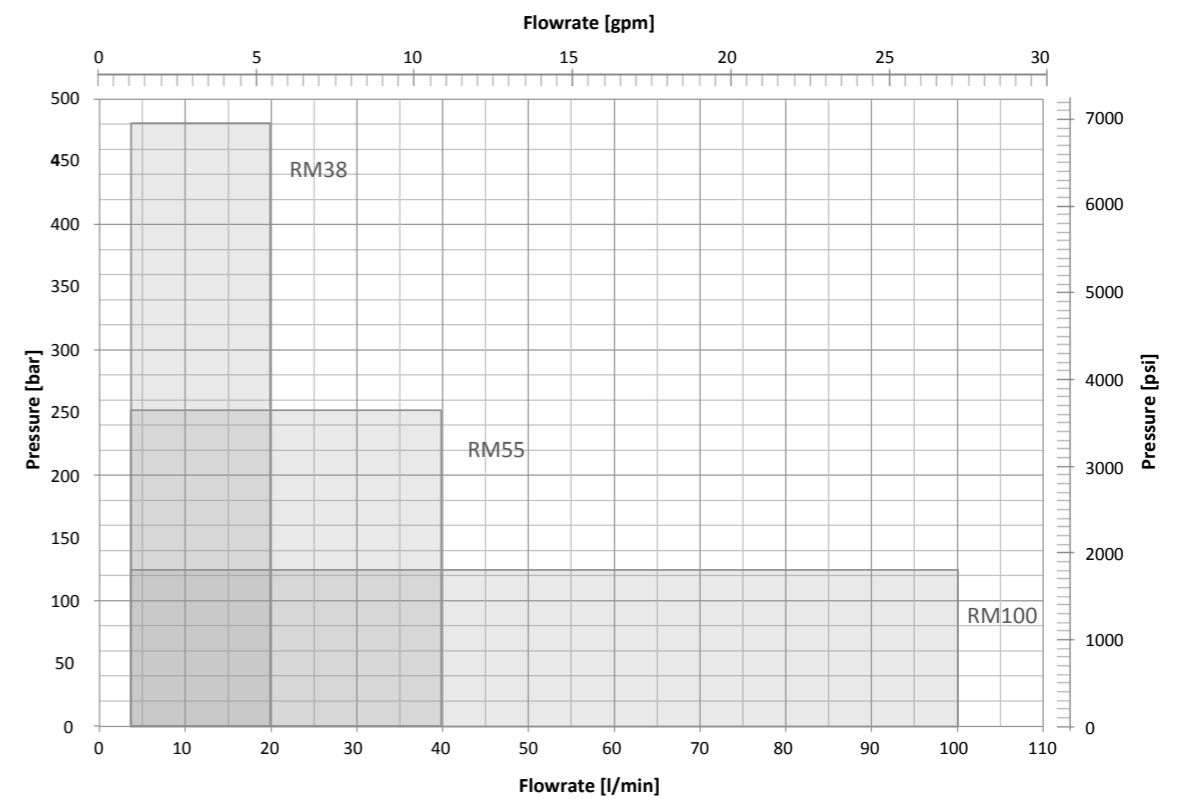
RECIPROCATING pumps

RECIPROCATING PUMPS

PUMP MODEL	SEAL SYSTEM			LIQUIDS PUMPED			INSULATION	
	GRD	GRS	Labyrinth	LIN/LOX/LAR	LCO ₂	LNG	Vacuum jacket	No jacket

PROCESS AND DISTRIBUTION PUMPS

RM-38DO	☑			☑				☑
RM-38D	☑			☑			☑	
RM-55DO	☑			☑				☑
RM-100D	☑			☑			☑	

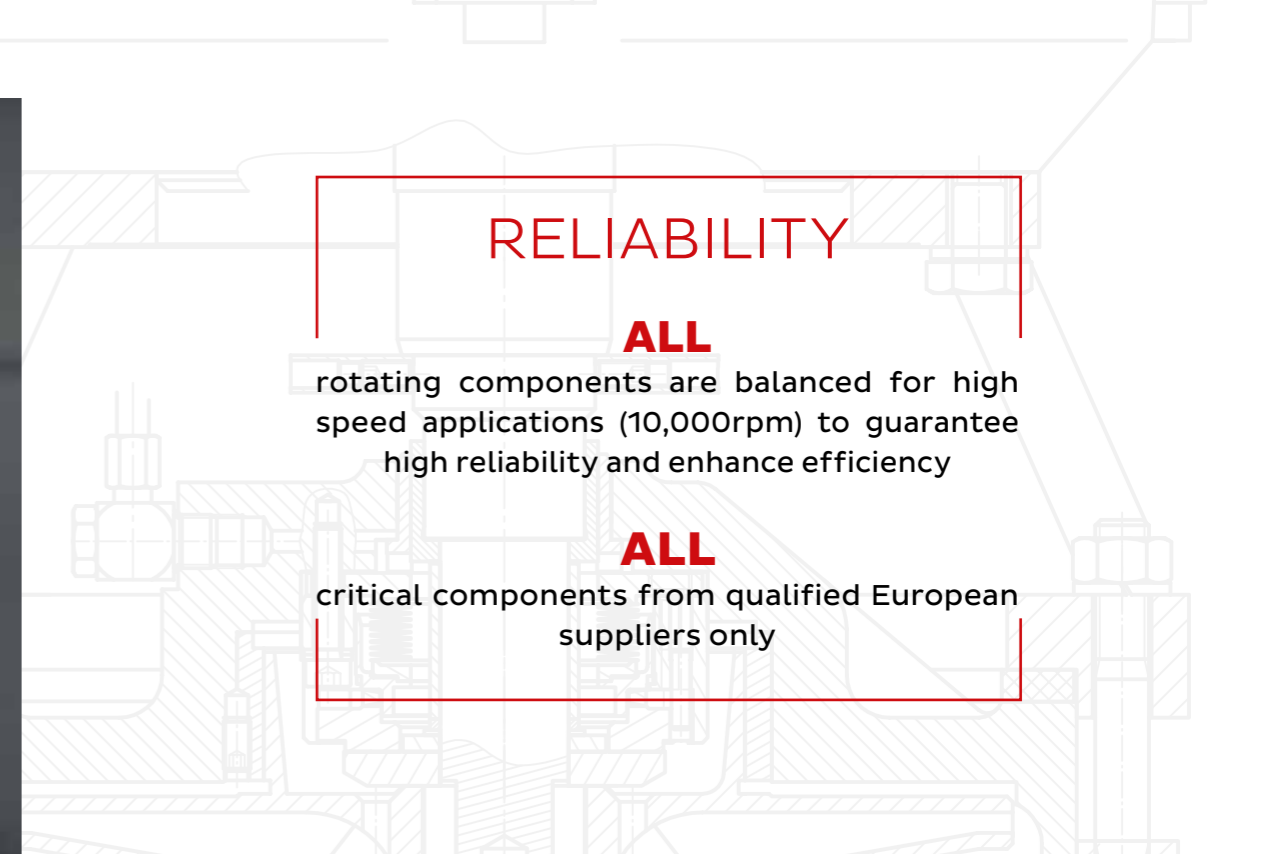




All Sefco pumps are designed and assembled according to the latest standards for oxygen service, irrespective of their actual application (oxygen service or not).



© LOX grade cleaning for ALL applications



RELIABILITY

ALL

rotating components are balanced for high speed applications (10,000rpm) to guarantee high reliability and enhance efficiency

ALL

critical components from qualified European suppliers only

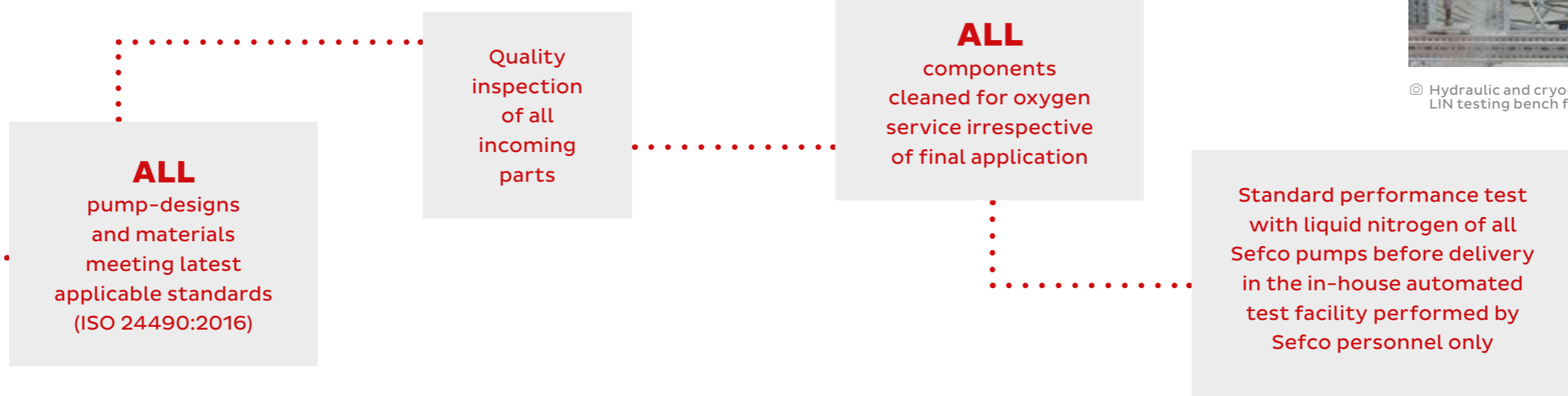


© Details: precision and accurateness for particulars



© Hydraulic and cryogenic test on fully automated LIN testing bench for ALL pumps

SAFETY



SUPPORT & services



© CL-20/EM-18 at a Linde ASU in Germany



SALES SUPPORT

Establishing the right operating parameters is essential when selecting the appropriate pump and pump components. This is why a designated sales engineer will talk to you during the initial phase of the project to guarantee an optimized solution that best fits your requirement. During operation of the pump our dedicated spare parts personnel will support you for the purchase of spare parts. All spare parts purchased either directly through Sefco or one of our affiliated SEFCO-Partners are OEM parts only. This will guarantee safe, reliable and warranted operation of your pump.



CUSTOMER SUPPORT

At Sefco, we foster communication starting from the early stages of the design process, through the project execution and the final performance testing to the after sales support. Giving you support through all phases will guarantee the success of our product.



PROJECT SUPPORT

Sefco's designated project engineer will keep you up to date with the development of the project and serves as your direct contact person throughout the project phase and performance testing.



REPAIR, MAINTENANCE AND CUSTOMER TRAINING

Our team of highly skilled and experienced Sefco technicians can resolve any pump problem you may encounter to insure that your system stays up and running. We perform on-site/workshop repairs and overhauls, pump checks and complete pump refurbishments. In addition, we offer customer-tailored training modules, either onsite or at a Sefco facility, to enhance your knowledge and handling of our products.



© Trailer unloading at Messer in Germany with a Hydran C-25/G2/HM



COMMISSIONING & START-UP

Sefco personnel are available to support you on-site during the commissioning and start-up phase. We will thoroughly check all aspects of the pump installation to guarantee a safe operation and will guide you through the start-up of the pump.

Sefco offers a continuously growing network of Service Partners around the world to guarantee immediate local support as well as the localized sale of spare parts. All our Service Partners are routinely trained by Sefco technicians to ensure the highest quality execution and support.

An up to date list of Sefco Authorized Service Partners is available at www.sefco.ch.



SEFCO CERTIFIED SERVICE PARTNERS

Sefco AG Switzerland

Headquarters

- 📍 Wuhrmattstrasse 15
CH-4103 Bottmingen
Switzerland
- ☎ +41 61 421 94 60
- 📄 +41 61 421 57 75
- ✉ info@sefco.ch
- 🌐 www.sefco.ch

Workshop

- 📍 Sundgauerstrasse 1
CH-4106 Therwil
Switzerland
- ☎ +41 61 421 94 60
- 📄 +41 61 421 57 75
- ✉ info@sefco.ch
- 🌐 www.sefco.ch

Sefco – China

Cryogenic Pump Company, LTD

- 📍 Room 102, No.3 Bldg. No.102,
470 Suide Rd,
Putuo District, Shanghai 200331
China
- ☎ +861 3916339275
- ✉ info@sefco-china.com
- 🌐 www.sefco.ch

Sefco – USA

Representative Office

- 📍 211 Farmers Grove Drive
Galivants Ferry, SC 29544
USA
- ☎ +1 716 983 4089
- ✉ info@sefco-usa.com
- 🌐 www.sefco.ch

sefco