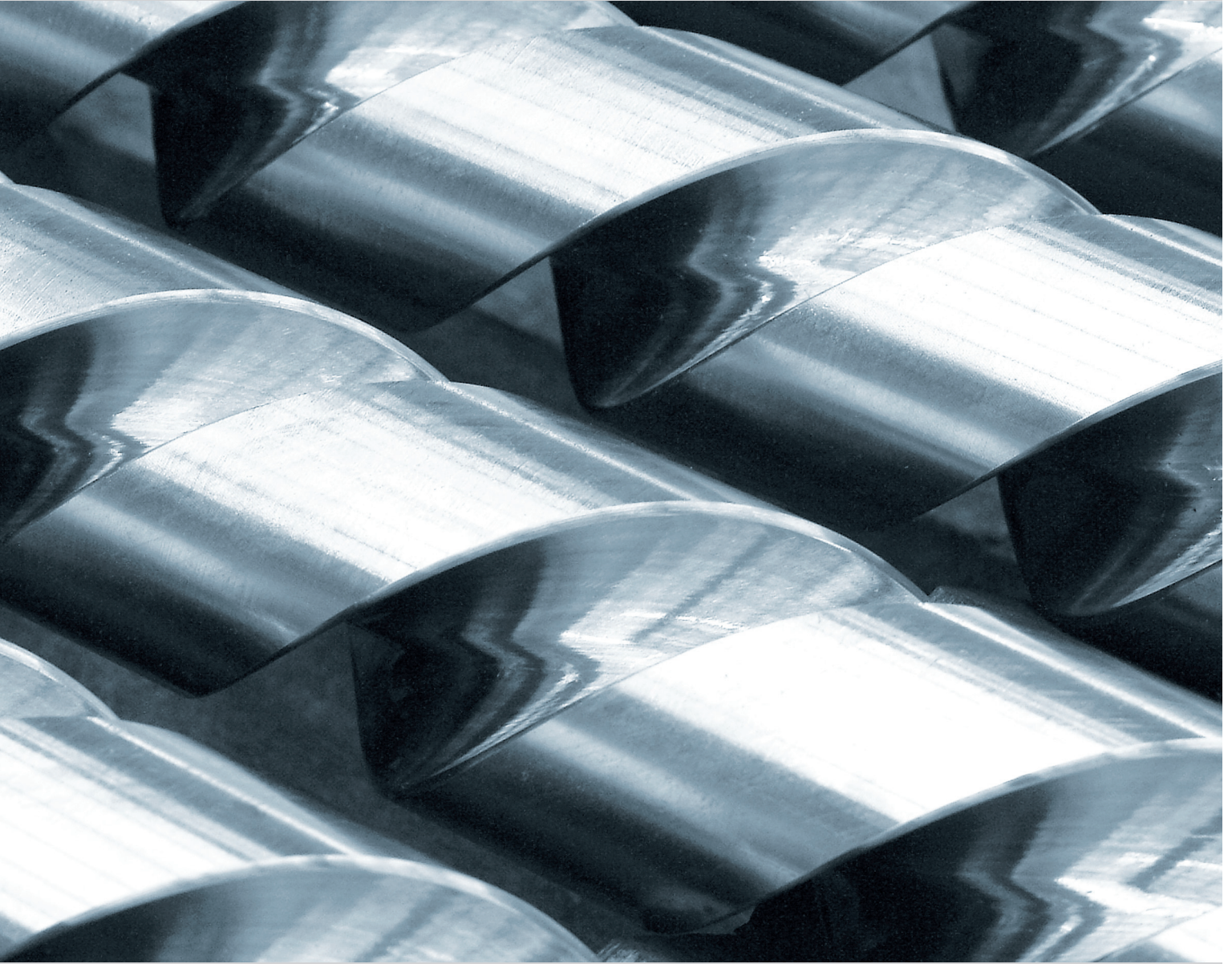


Leistritz Screw Pumps & Systems



**Chemical
Industry**



Leistriz Screw Pumps & Systems

Leistriz Pumpen GmbH

Leistriz Pumpen GmbH, with its headquarters in Nuremberg/Germany, has been producing and selling Screw Pumps since 1924. The first Leistriz Screw Pumps were developed by Paul Leistriz as main lube oil pumps for bearings of turbine generator sets. With the worldwide widest product range of Screw Pumps, Leistriz offers today complete pump packages, being a perfect partner for the Chemical Industry.

Latest technology in combination with strictly controlled quality is the basis for the globally known Leistriz Screw Pump reliability and efficiency.



The Chemical Industry

The chemical industry develops and produces a large variety of products for the widest range of application.

On the one hand the chemical industry produces primary products for other industries such as polymer processing, the automotive industry or the construction industry. Basic and petrochemicals, polymers as well as the fine and specialty chemicals belong to these various groups of products.

On the other hand, chemical finished products are being used in the food and pharmaceutical industry, in environmental protection or the cosmetics industry.

The product range of the chemical industry is subject to constant change due to new technologies and processes, changing demands and strong competition. The chemical industry has particularly also a responsibility in the sector of environmental protection.

For decades Leistriz Screw Pumps and Systems are used in all areas of the chemical industry wherever it comes down to the highly efficient and dependable production of mostly high-viscosity products.

Due to the availability of the world's largest program of screw pumps, Leistriz Pumpen GmbH offers the advantage of a broad product range for efficient and flexibly adaptable pump solutions.

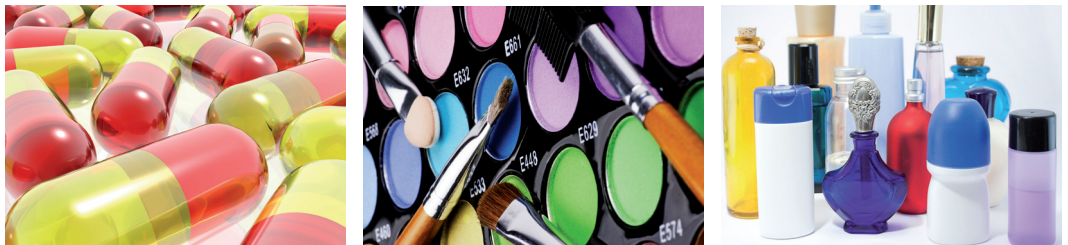
The Chemical Industry From Basic Chemicals to Consumer Goods

Basic Chemicals



Basic chemicals are at the beginning of the value added chain in the chemical industry. These base materials are mostly simple substances and serve as raw material for a lot of other industrial products such as synthetics, paint, glue and numerous other chemical products. They are manufactured as mass products in procedurally optimized large-scale plants.

Fine Chemicals



In the fine chemistry high-quality, chemically pure substances are being developed and produced for the pharmaceutical, cosmetics and food industry. Rapid production changes, highest demands of product quality as well as a high process efficiency characterize the fine chemistry. Due to constantly shortening product life cycles and rising product and option variety a short “time-to-market” strategy becomes an increasing factor for success.

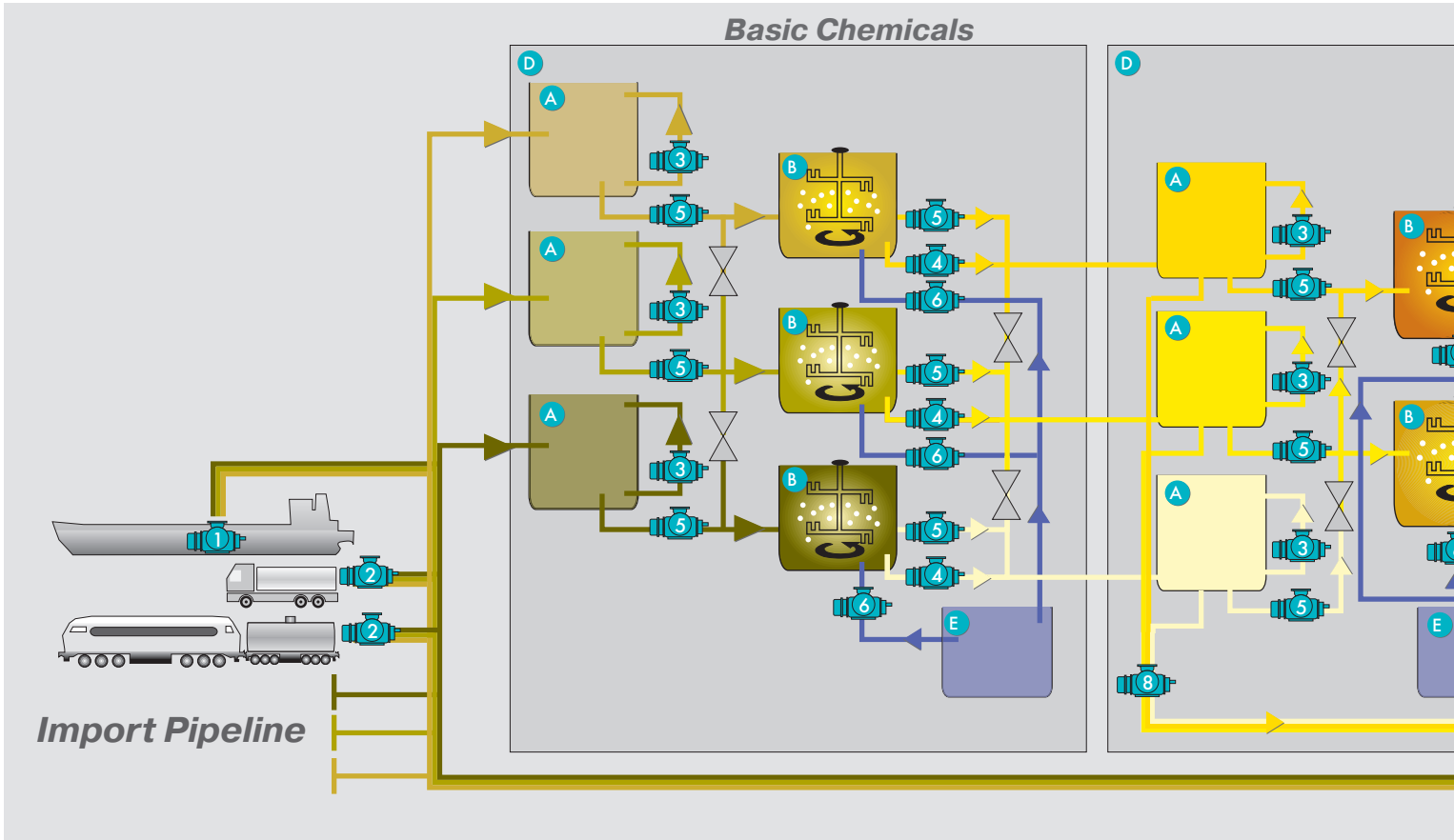
Specialty Chemicals



Special chemicals are substances which are either processed in the chemical-pharmaceutical industry or are used in numerous other segments of the industry for special effects. Pigments for cosmetics, process chemicals for chip production, additives for paint and enamel varnishes, liquid crystals for screens and displays and additives for detergents and cleansers are only a few products of the special chemistry. High investments in research and development are an essential requirement to endure the growing competition in the long run. Compared to mass-produced basic chemicals, manufacturing costs are usually very high in the special chemistry.



Leistritz Screw Pumps in the Chemical Industry



Raw Products

- Raw Product 1
- Raw Product 2
- Raw Product 3

Symbols

- Agitator
- Barrel Filling
- Small Container
- IBC Container
- Valve

Screw Pumps

- 1 Leistritz Ship Unloading Pump
- 2 Leistritz Unloading Pump
- 3 Leistritz Circulating Pump
- 4 Leistritz Drainage Pump
- 5 Leistritz Transfer Pump
- 6 Leistritz Tank Cleaning Pump
- 7 Leistritz Blending Pump
- 8 Leistritz Loading Pump
- 9 Leistritz Dosing Pump
- 10 Leistritz Stripping Pump

Storage- and Processing Containers

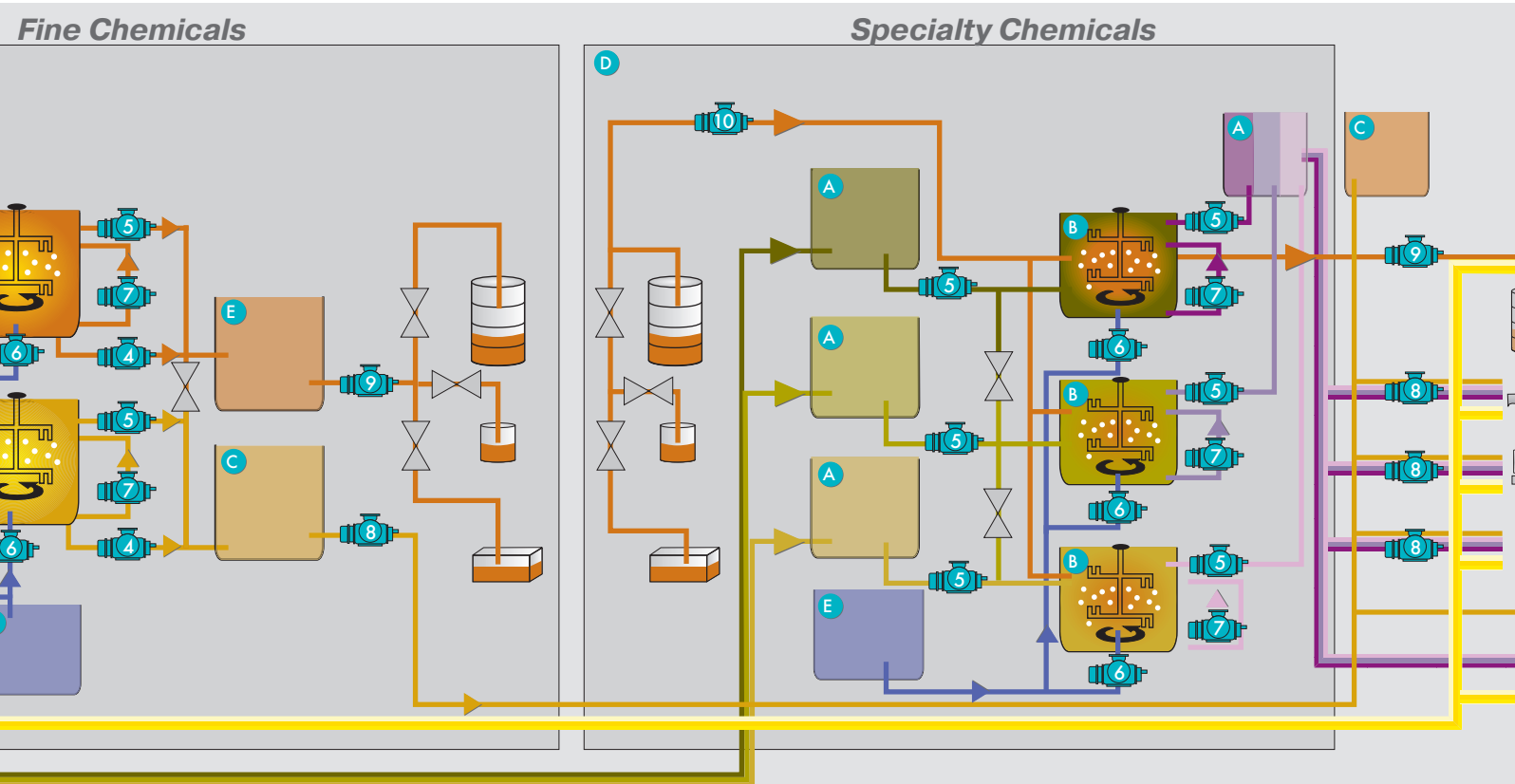
- A** Tank Storage
- B** Blending Container
- C** Finished Product Storage
- D** Manufacturing Process
- E** Solvent Tank

Finished Products

- Finished product 1a
- Finished product 1b
- Finished product 1c
- Finished product 2a
- Finished product 2b
- Finished product 3a
- Finished product 3b
- Finished product 3c

Cleanser Products

- Solvent



1 Leistriz Ship Unloading Pump

The pumps installed on board of vessels are used for unloading various organic and inorganic base chemicals e.g. silicates or benzene and high viscous fluids like crude oil or bitumen. The preferred pumps for these raw materials delivering from ships to tank storages are Leistriz pumps of series L2 and L5. These self-priming pumps guarantee a smooth, low-pulsation delivery of low- to highly viscous fluids also containing solids.



Leistriz Ship Unloading Pump L4NG

2 Leistriz Unloading Pump

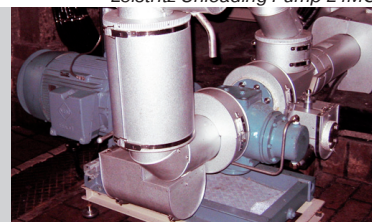
The unloading pumps, installed directly at the industrial site, discharge the raw products delivered via rail or road and transport them safely and reliably to the holding tanks. For this purpose Leistriz Screw Pumps, series L2 and L5 are suitable due to the fact that they can deliver large volumes and high viscous substances, containing solids without difficulties.



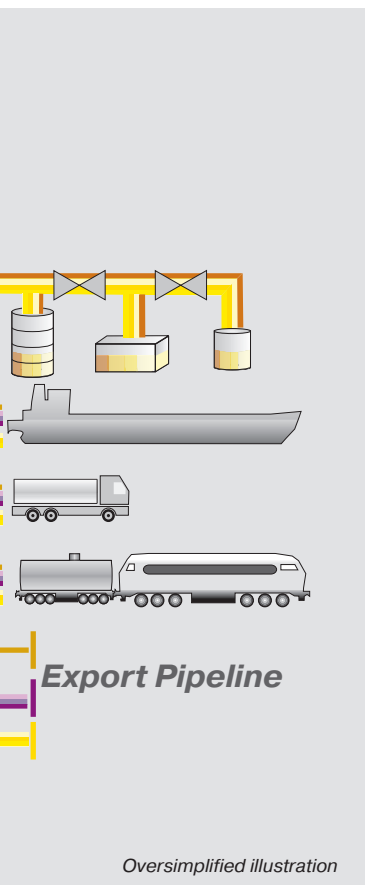
Leistriz Unloading Pump L4MG

3 Leistriz Circulation Pump

To keep the fluids in the storage tanks homogenous and to hold product temperatures, low pulsation Leistriz Circulation Pumps of the L2 series are used.

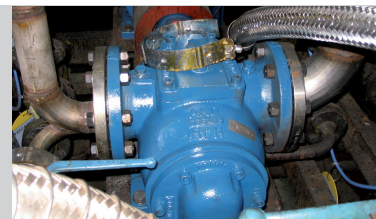


Leistriz Circulation Pump L2NG



4 Leistritz Drainage Pump

To empty storage tanks to a certain limit and to deliver the raw products to their production process, Leistritz Screw Pumps of the series L2 are used. They can also be applied for draining of discharge pipes in reverse rotation.



Leistritz Drainage Pump L2NG

5 Leistritz Transfer Pump

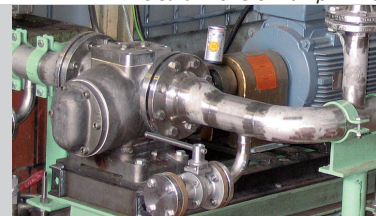
Leistritz transfer pumps of the series L2 and L4 are used for transportation of the basic and intermediate products in chemical production processes. Due to their operational characteristics at high viscosities and discharge pressures, they ensure a continuous and fit-to-demand operation.



Leistritz Transfer Pump L4MG

6 Leistritz Tank Cleaning Pump

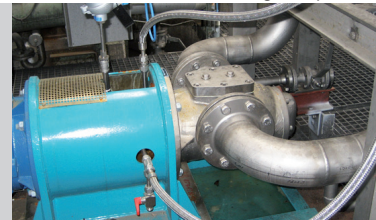
For the cleaning of storage tanks, pipelines and blending tanks Leistritz tank cleaning pumps of the L2 series are used in a closed flushing loop.



Leistritz Tank Cleaning Pump L2NG

7 Leistritz Blending Pump

With L2-blending pumps various fluids with different consistencies are moved from tanks or containers into blending tanks. The exact controllability of the individual pumps ensures a high-quality finished product.



Leistritz Blending Pump L2NG

8 Leistritz Loading Pump

Finished or refined products are moved by Leistritz Screw Pumps, series L2 and L4 for consecutive transportation with ships, trains or tank trucks. These pumps have an excellent priming performance and can be adapted to the particular need by a flexible rpm-adjustment.



Leistritz Loading Pump L2NG

9 Leistritz Dosing Pump

Leistritz Screw Pumps, series L2 and L3 are used to transport mixtures into big and small containers and barrels. Various fluids with different viscosities are precisely dispensed with low pulsation.



Leistritz Dosing Pump L2NG

10 Leistritz Stripping Pump

In Special Chemistry Leistritz L2 pumps are used for stripping barrels, small containers or IBC containers. Various fluids are transported gently with low-pulsation. A rpm-adjustment via a frequency inverter is often used during the stripping of containers in order to achieve a high dosing accuracy.



Leistritz Stripping Pump L2NG



Leistriz - Hermetically Sealed

Hermetically Sealed Screw Pumps

To meet the chemical industry's high demands in environmental compatibility, safety and economic efficiency, Leistriz constantly develops efficient pump solutions for specific applications.

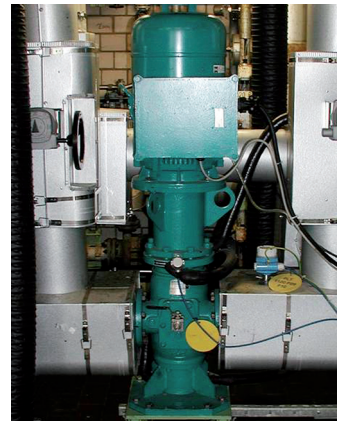
Leistriz magnetic-driven Screw Pumps are hermetically sealed and provide the chemical industry a high level of safety in those fields, where poisonous, hazardous, explosive or corrosive liquids have to be transported. Leistriz Screw Pumps meet the requirements for explosion protection according to ATEX 94/9/EG as well as the requirements of API 676 and the new machinery directive 2006/42/EG.

Batch-Operation

During batch-operation for some hours various kinds of polymers (up to 10.000 cSt) or Isocyanides are being pumped from blending containers. Before use of a new polymer, the production system has to be cleaned with a solvent.

For these special applications and demands of the chemical industry Leistriz developed for the flushing process in close cooperation with the operator a hermetically sealed screw pump, series L2, with special bearings and a special magnetic coupling, which reliably transports high poisonous liquids like isocyanides as well as volatile solvents.

The vertical arrangement of the pumps allows a complete draining after shut down.



Leistriz Batch Pump L2NG

Polyurethane Production

High viscosities as well as abrasive fillers and low temperatures are characteristic for the transportation of polyol and isocyanides (polyurethane). Due to these aggressive substances conventional mechanical seals wear quickly. Leistriz Pumpen GmbH developed an innovative L3 screw pump with a magnetic coupling, which transports the fluids gently even at high rpm with zero leakage

The hermetically sealed magnetic coupling prevents air inlet and leakage. The dead-space-free construction - here in pedestal design - effectively prevents the hardening of polyol and isocyanides.

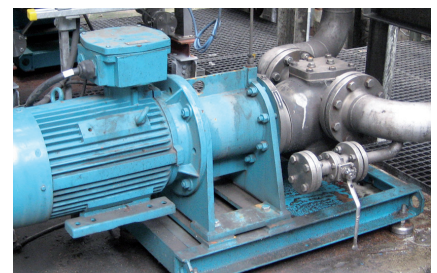


Leistriz Polyurethane Pump L3MG

Water-Based Paint Application

To meet the high environmental restrictions of the automotive industry screw pumps with magnetic couplings are used to produce water-based paint. The pumps are hermetically sealed towards the atmosphere and ensure a safe operation with critical fluids of the water-based paint production.

Leistriz Screw Pumps, which transport and blend water- and solvent-containing, low- or high-viscous liquids safely and eco-friendly, meet the requirements of the German directive TA-Luft.



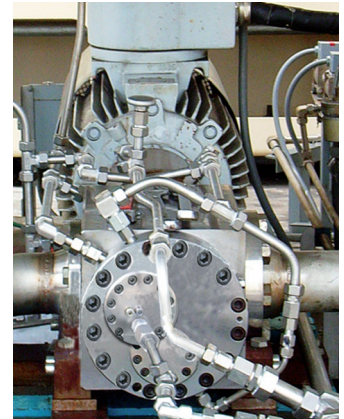
Leistriz Blending Pump L2NG in Production for Water-Based Paint

Leistritz - Special Screw Pump Designs

Leistritz Methanol Pump

In close cooperation with a manufacturer of gas turbines Leistritz Pumpen GmbH developed a screw pump type L4HK, which transports methanol for fuel-feeding a gas turbine featuring:

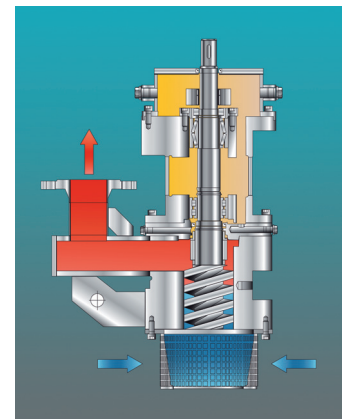
- Gentle transportation of highly flammable and volatile liquids with extremely low viscosities ≤ 0.6 cSt
- Discharge pressure ≥ 60 bar
- Speed range up to 3800 rpm
- Optimum control of flow rate to the burner nozzle by frequency inverter-operation



Leistritz Methanol Pump L4HK

Leistritz Semi Submersible Pump L4NT

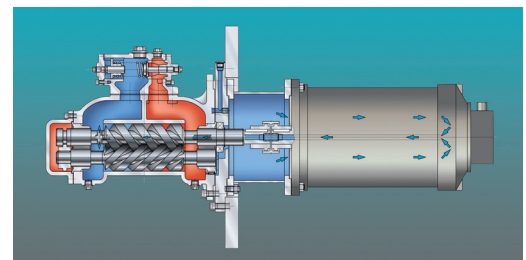
- 100% dry running ability with flushed mechanical seal
- Pumping of products with a gas content of 100%
- Reversible transportation made by reverse rotation
- Excellent NPSH values ≤ 1 mWC
- Operation at extremely low viscosities ≤ 1 cSt
- Speed range up to 3600 rpm
- Gearwheels and bearings in separate oil bath (outside pumped liquid), therefore universal application
- Gentle transportation
- Simple installation and maintenance



Sectional Drawing L4NT

Leistritz Canned Motor Pump L2NC

- Transportation of partly lubricating fluids at 3 to 1.000 cSt without abrasive particles
- Low maintenance due to elimination of all primary seals towards atmosphere
- No external bearing lubrication necessary
- Non-sensitive to gas fractions in transported liquid
- Low weight due to encapsulated motor
- Canned motor cooled by pumped liquid
- Operating temperature up to 100° C



Sectional Drawing L2NC

Leistritz - Services

Customer Service

Leistritz Screw Pumps are products of continuous customer oriented optimization and development. Professional Leistritz Customer Service is based on worldwide, close and long term partnership with engineers, operators and endusers.

Leistritz performs:

- Delivery and Installation of Genuine Leistritz Spare Parts
- Inspection, Maintenance and Repair
- Service and Maintenance Contracts
- Installation, Commissioning and Retrofits
- Training, Advisory
- Pump Operations under Test Conditions
- Project Supervision
- 24h Service: +49 911/ 43 06 - 690

Test Fields

Oil- and Water- Test Fields for individual parameter check and control

- 5 Test Fields
- 4 MW Test Field
- Computer Controlled Recording of Measurement Reading
- Large Volume Tanks for Long Test Periods

Quality Assurance

Latest technology in combination with strictly controlled quality is the basis for the world-wide known Leistritz Screw Pump reliability and efficiency. Leistritz Quality Assurance concentrates on compliance with highest quality standards, e.g.:

- Use of Latest CMM Technology
- Constant Monitoring of all Manufacturing Processes for Small Tolerances
- Strict Tolerance Compliances for High Pump Efficiency and Low Life Cycle Costs
- Know-How-Transfer Due to Close Collaboration with Universities and Independent Institutes

Certificates

Leistritz Pumpen GmbH is Certified According to:

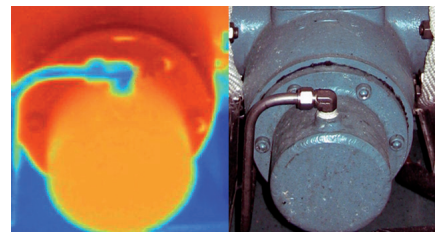
- DIN EN ISO 9001:2000
- DIN EN ISO 14001:2005
- OHSAS 18001
- RS Supervisor
- ROSTECHNADZOR
- GOST-R
- GOST-K



Leistritz Overhaul Team



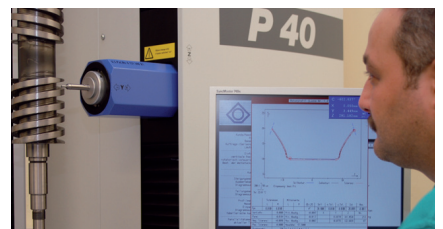
Professional Site Inspection



Pump inspection with a thermal-imaging camera



Leistritz Test Field



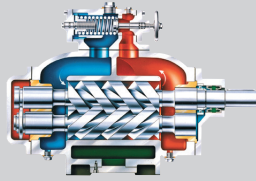
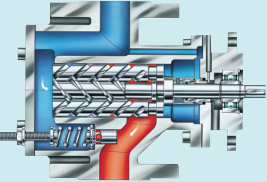
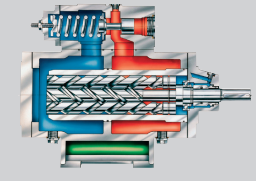
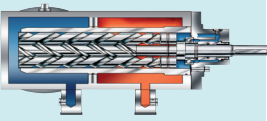
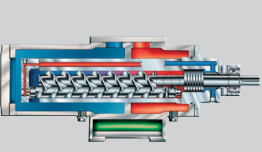
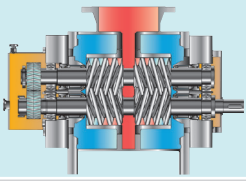
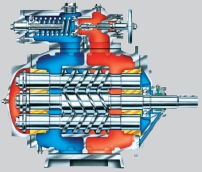
Monitoring of all Manufacturing Processes



Leistritz Certificates



Leistritz Screw Pump Programm

Series	Use for	Leistritz Screw Pump	Maximal Performance Data			
			Capacity	Differential Pressure	Viscosity	Pumping Temperature
L2	Low pressure duty, suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		900 m ³ /h [3,960 gpm]	16 bar [232 psi]	100,000 cSt	280°C [536°F]
L3N	Low pressure duty, suitable for transport of non abrasive lubricating fluids.		700 m ³ /h [3,100 gpm]	16 bar [232 psi]	15,000 cSt	180°C [356°F]
L3M	Medium pressure duty, suitable for transport of non abrasive lubricating fluids.		300 m ³ /h [1,320 gpm]	80 bar [1,160 psi]	10,000 cSt	280°C [536°F]
L3H	High pressure duty, suitable for transport of non abrasive lubricating fluids.		200 m ³ /h [880 gpm]	160 bar [2,320 psi]	10,000 cSt	280°C [536°F]
L3V/U	Ultra high pressure duty suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		180 m ³ /h [792 gpm]	280 bar [4,060 psi]	1,000 cSt	280°C [536°F]
L4	Low, medium and high pressure duty, suitable for transport of abrasive/non abrasive, corrosive/non corrosive, lubricating/non lubricating, high or low viscous fluids.		5,000 m ³ /h [22,000 gpm]	150 bar [2,175 psi]	150,000 cSt	350°C [662°F]
L5	Low pressure duty, suitable for transport of light abrasive and corrosive, high or low viscous fluids with poor or good lubricity.		1,700 m ³ /h [7,500 gpm]	10 bar [145 psi]	100,000 cSt	280°C [536°F]

Exceeding operating conditions upon request. Reference Pictures: page 1 "BASf", page 2 "Bayer Material Science AG"

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