Leistritz
PUMP TECHNOLOGY

Screw Pump Solutions for Oil & Gas Production.

More Efficiency and Sustainability.

Home Base for Your Peace of Mind.

Leistritz Pump Technology: Who we are and what we do.

Solving problems before you have them

Pump solutions may not be exciting, but that's the point: running smoothly, you have no hassles and no costs where budgets are strapped and schedules tight. Our scope is our engineering pride, coming to grips with your process and your specs. It's not the pump, it's the people behind it that deliver solutions to problems before you have them.

Powered by your applications

We're on your side, even when we're not around. That's a sign that all is well. Our pump technology has a reputation for being indestructable, running 15, 20, even 30 years without a hitch.

Saving you time and money, so you are free to concentrate on your business. Which is oil and gas. Never pumping. Let that be our worry. Powered by performance.

Backed by the world's largest range of twin, triple, four and five screw pumps, our scope of supply embraces standard and customised solutions for all applications in the oil and gas industry.

We are big on innovation and technology, but even bigger on service. We're on site whenever and wherever you need us.

- **Upstream:** Production/FPSO, offshore, onshore, central processes, crude transfer
- **Midstream:** Distribution and storage, pre-treatment
- **Downstream:** Refineries, distribution and storage

Built for Oil & Gas. Engineered for Good.

Expertise, Engineering, Certification, Performance Parameters.

Others ask for the route. We're on site already.
Our expertise is hands-on. We love going into detail. And we don't mind getting dirty. We've been on site and back. To create answers that last. And solutions that endure.

Quality, precision, innovation setting the pace
We build our systems to state-of-the-art quality and precision. Core technologies are made in Germany. Our R&D is working on more efficiency, new materials and optimised parts.

Tried and tested
Our testbed in the Leistritz Plant in Germany is envied by some and feared by many. Our pumps are tried in gruelling conditions. Less wear and tear means safety from costly shutdowns.

Approved and certified
Tough quality means a smooth ride. For decades. And for tough certifications such as: EN ISO 9001, 14001, 50001, OHSAS 18001, ABS, BV, DNV GL, RINA and RMRS.

"We take pride in our spotless track record as a reliable supplier with a full scope of supply."

Emiliano Maianti
Head of Leistritz Pump Technology
Oil & Gas Unit

Expertise

Benefit from our broad scope of technical expertise, supporting your processes, greenfield, extension and RMO plans.

Reliability

Leistritz provides the largest scope of screw pump technologies and supports you on your long-term demands for safety in operation.

Certification

Leistritz screw spindle pumps and systems are approved and certified according to all industry standards.

Performance Parameters:

FLOW VOLUMES
up to 5,000 m^3/h

VISCOSITIES
up to > 3,000 cSt

DIFFERENTIAL PRESSURES
up to 100 bar

GAS VOLUME FRACTIONS
up to 100%

Understood. Upstream.

Upstream Technologies & References

Pump systems for production

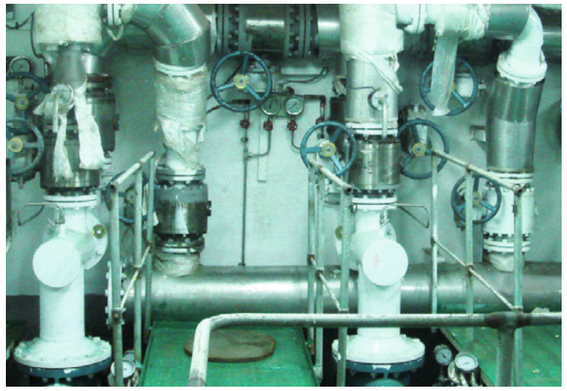
Applications:	Marginal and declining oil fields: multiphase booster pump for untreated well flow, transport to central treatment facility. External liquid management to cope with slug flow. Multiphase pump solution with thermal insulation. Multiphase pump solution on offshore platforms, skid desin adapted to available space Portable, self-contained multiphase pump unit to remove and boost liquids. Eliminates the need for flaring and venting. Enables capturing all gas and NGLs in existing pipelines Produced water pump solution for re-injecting water into reservoir to force oil to the surface
Gas volume fractions:	< 100% (GVF)
Flow rates:	< 5,000 m^3/h
Pressures:	< 100 bar

Pump systems for floating production, storage & unloading (FPSO)

Applications:	Pump solution for electrostatic dehydration to separate water (H_2O: 0.2 – 0.5%) from crude oil Booster pump for separating and treating formation or produced water Crude forwarding pumps for transferring crudel oil from tank to tanker and back Pumps systems for stripping viscous tank bottom residues with solid contents Pump solutions for slops and drains to collect leakages and drainages
Challenges:	Agressive, corrosive content, highly viscous materials including solids
Gas volume fractions:	< 100% (GVF)
Flow rates:	< 5,000 m^3/h
Pressures:	< 100 bar

Pump systems for crude transfer

Applications:	Booster pumps to ensure reliable run during changing operation and start up Start up pump systems: high pressure performance and differential pressure up to 100 bar Crude transfer pumps with flow rates up to 4,000 m^3/h Pumps systems for stripping viscous tank bottom residues with solid contents. Pump solutions for slops and drains to collect leakages and drainages
Challenges:	Agressive, corrosive content, highly viscous materials including solids
Gas volume fractions:	< 100% (GVF)
Flow rates:	< 400 m^3/h
Pressures:	< 100 bar



Leistritz multiphase pumps and systems handle untreated well flow with gas volume fractions <100 %, flow rates <5,000 m^3/h and differential pressures <100 bar. With the screw pump as the heart of the system, the scope of supply includes baseframe, driver, instrumentation, on-skid piping with valves, auxiliary systems and control equipment.

Mastered. Midstream.

Midstream Technologies & References

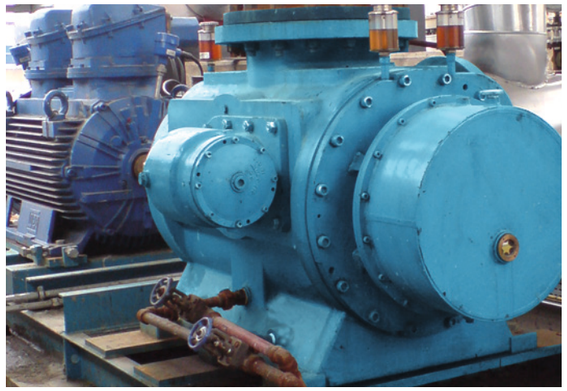
Pump systems for distribution and storage

Applications:	Pump solutions for unloading different oils from trucks and railcars
	Loading and transfer pump solutions
	Crude oil circulation pump solutions to avoid separation and maintain temperature
	Residue and tank cleaning pump solutions for viscous residues (oil sludge and solids)
	Stripping pump solutions for heavy and viscous material containing solids
Viscosities:	> 3,000 cSt
Flow rates:	< 4,500 m^3/h
Pressures:	low NPSHR values

Pump systems for pre-treatment

Applications:	Pump solutions for unloading different oils from trucks and railcars
	Loading and transfer pump solutions
	Crude oil circulation pump solutions to avoid separation and maintain temperature
	Residue and tank cleaning pump solutions for viscous residues (oil sludge and solids)
	Stripping pump solutions for heavy and viscous material containing solids
Viscosities:	> 3,000 cSt
Flow rates:	< 4,500 m^3/h
Pressures:	low NPSHR values

L2- and L5-series pumps for unloading oils from trucks and railcars have only one sealing to the atmosphere while the L4-Series can offer an interchangeable liner. These pumps are self-priming and have run dry and solids capabilities.



Crude oil is circulated using the L2, L3 and L4 pump series to avoid separation, to maintain temperature and to flush system pipework.

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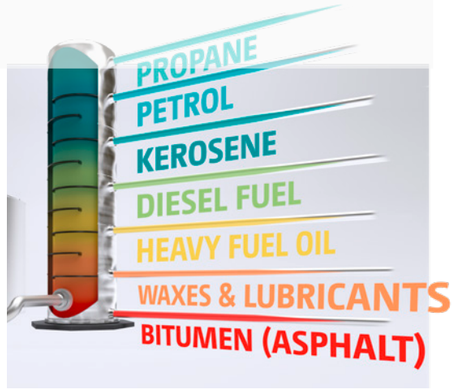
Hundreds of oil fields all over the world rely on Leistritz pump performance to deliver the bpd figures reliably and long distance. An example is Kome oil field in Tchad, North Africa: 15 Leistritz Multiphase pump skids push 1,000 m^3/h of oil and gas at 1,000 HP through a pipeline 1,000 km to the Atlantic ocean.

Done. Downstream.

Downstream Technologies & References

Pump systems for oil distribution and storage

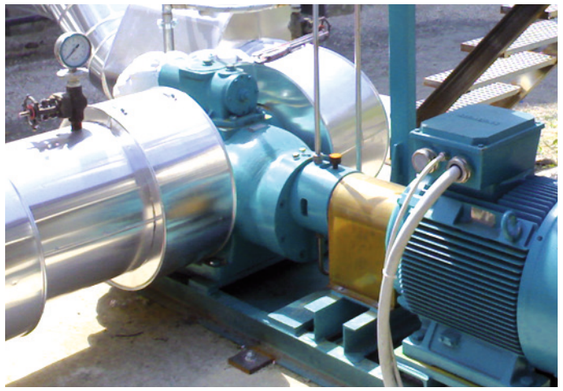
Applications:	Self-priming, unloading pumps with dry run and solids handling capabilities. Loading and transfer pumps with high suction performance for fast loading Crude oil circulation pump solutions to avoid separation and maintain temperature Residue and tank cleaning pump solutions for viscous residues (oil sludge and solids) Stripping pump solutions for heavy and viscous material containing solids
Viscosities:	> 3,000 cSt
Flow rates:	< 4,500 m^3/h
Pressures:	low NPSHR values



Pump systems for refineries

Products:	Light distillates (LPG, gasoline, naphtha) Medium distillates (kerosene, diesel) Heavy distillates/residues (fuel oil, lubricating oils, wax, tar)
Applications:	Crude unloading and final product loading pumps Crude charging pumps Atmospheric tank bottoms / vaccuum pumps Blending and final product transfer pumps Circulation pumps

Leistritz screw pump replacement for higher flow volumes and less power consumption in existing pipelines (new base frame an electronics). Easy maintenance thanks to magnetic coupling, just one seal and fewer spare parts.



Pump solution for circulation of viscous products (asphalt, bitumen) in storage tank to ensure homogeneous product quality at all tank levels.

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Leistritz solutions have proven their ability uncounted times in coping with abrasive, corrosive and even hazardous products difficult to pump. Our in-depth understanding of products, processes, reactions, properties, viscosities, sensitivities, compositions and conditions is your advantage in finding a solution that works reliably, first time, every time.

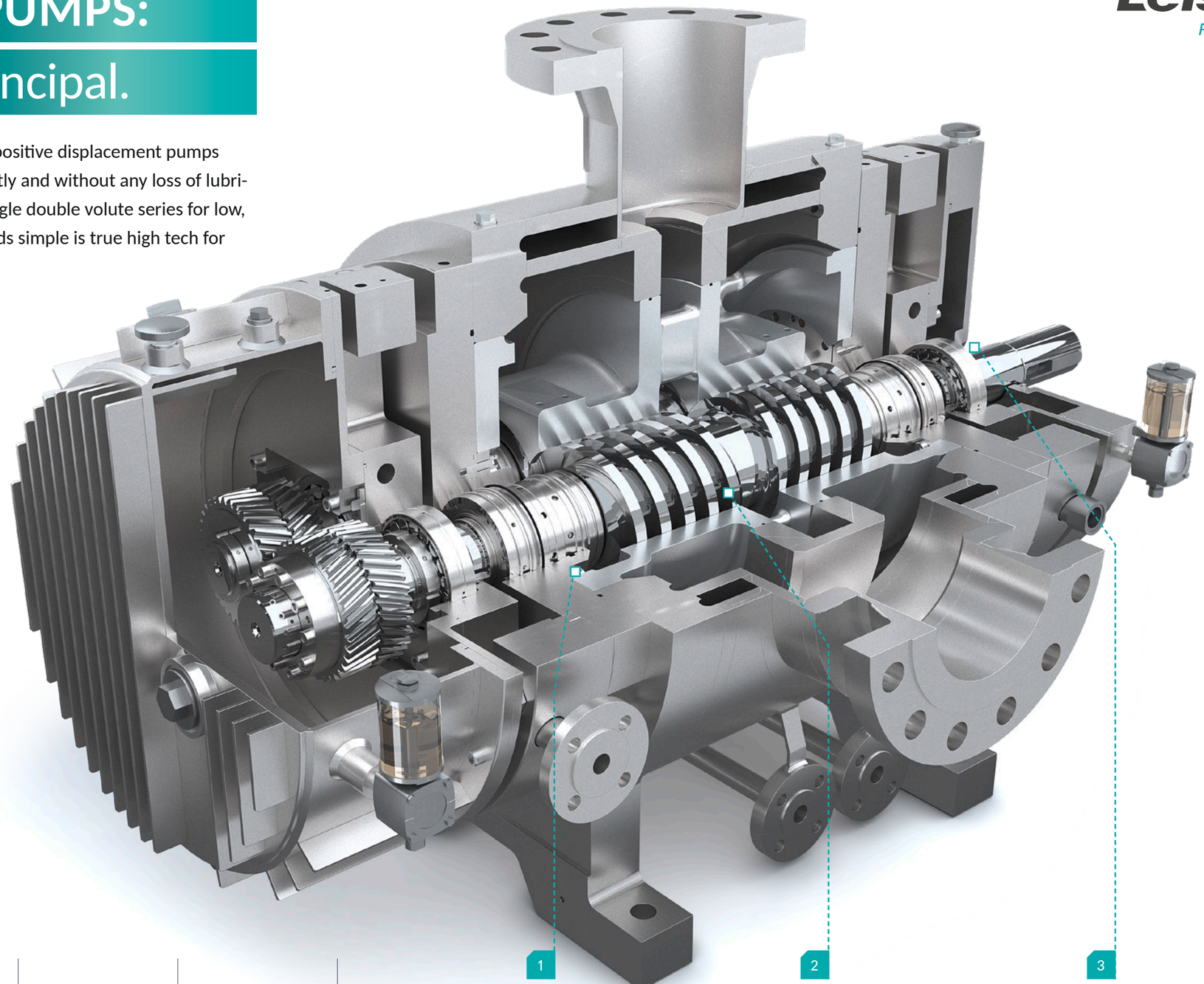
LEISTRITZ SCREW PUMPS:

The Performance Principal.

A convincing technological principle: screw pumps are positive displacement pumps with rotating 'screws'. The product is displaced constantly and without any loss of lubrication or turbulence. The pump range includes both single double volute series for low, medium, high and ultra high pressure duty. What sounds simple is true high tech for reliability and smooth operation.

Benefits for your Oil & Gas lines:

- Efficiency on CAPEX and OPEX
- Self-priming
- Constant pulsation-free liquid flow
- High flow volumes up to 100 m^3/h
- Broad viscosity spectrum
- Easy cleaning
- Low life cycle costs
- Low NPSH required



TECHNICAL DATA: SCREW PUMPS

Basic parameters			
Flow volume:	200 – 5,000 m^3/h	880 – 22,000 gpm	< 755,300 bpd
Differential pressure:	10 – 280 bar	145 – 2,175 psi	
Gas volume fraction (GVF):	< 100%		
Operating temperature	180 – 350°C	356 – 662°F	
Viscosity:	10,000 – 150,000 cSt		

1

Plug-and-Play Operation

Self-priming, high efficiency, low operating costs.

2

Easy Installation & Maintenance

Optimised installation and **easy maintenance** thanks to only one shaft seal, magnetic drive (seal-free design) or interchangeable casing insert

3

Optimised Process Safety

Axially balanced rotors avoid forces on bearings. Dry run and solids capabilities.

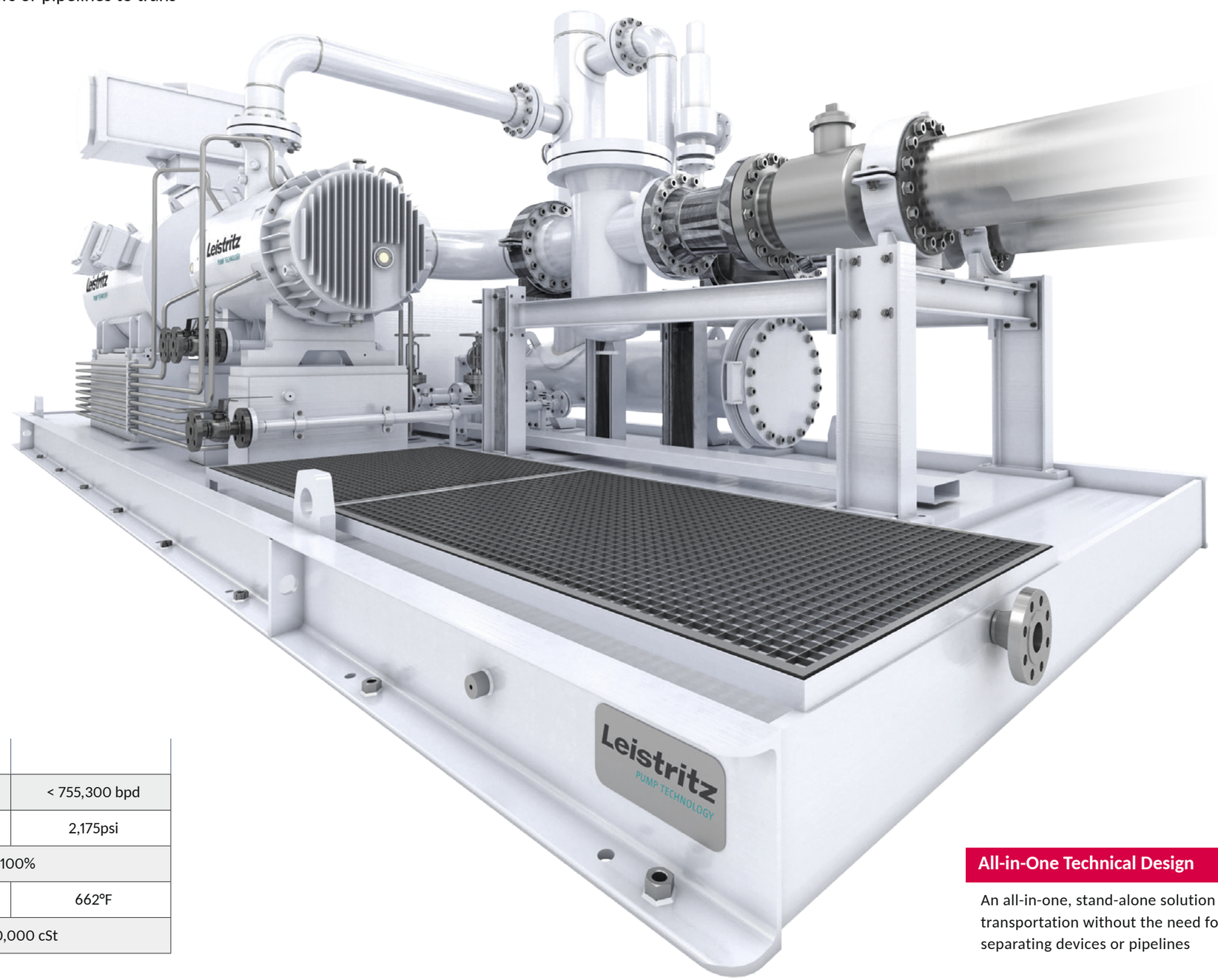
MULTIPHASE: A Star is Born.

Multitalent for Oil & Gas.

Multiphase pump technology is a true multitalent for getting and keeping multi-phase fluids moving in a single pipeline. It needs no space-consuming separation devices at the borehole, nor separate pumps, compressors or pipelines to transport gas and fluid to the central collection areas.

Benefits:

- Cost-effective technology for multiphase fluids
- No separation devices
- Single pipeline
- High performance
- Space saving



TECHNICAL DATA: MULTIPHASE

Basic parameters		
Flow volume:	< 5,000 m^3/h	< 755,300 bpd
Differential pressure:	< 150 bar	2,175psi
Gas volume fraction (GVF):	<100%	
Operating temperature	< 350°C	662°F
Viscosity:	< 150,000 cSt	

All-in-One Technical Design

An all-in-one, stand-alone solution for oil and gas transportation without the need for additional separating devices or pipelines

HYDROCOMPRESSION:

Combining the Best

Leistritz Hydrocompressor Technology combines the best of two technologies: the performance of screw pumps and the advantages of wet gas compressors. It has proven itself all over the world as the ultimate in multiphase pump applications. You benefit from a more intelligent setup. You need fewer devices. Your advantage: drastic cost reduction: 25% less energy consumption plus fewer process steps, a smaller motor with a smaller VFD. This pays into a significant reduction in operating costs – not to mention substantially lower capital expenditure.

Combining two technologies to become first in class!

Benefits:

- Reduced CAPEX and OPEX
- 25% less power consumption
- Smaller motor and VFD
- Tolerant to liquid slugs
- Process cooling redundant
- Up to 100 % gas volume fraction
- Perfect solution for low inlet pressures

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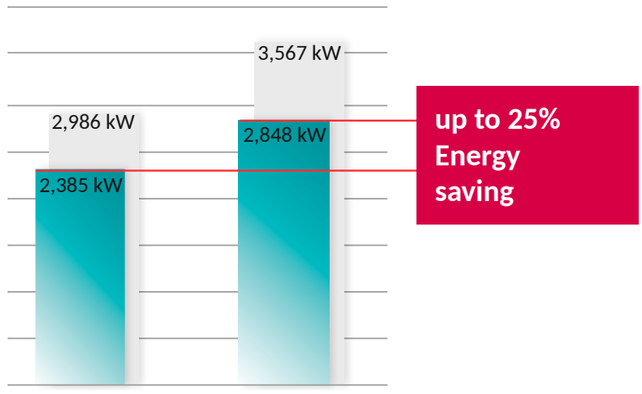
COMPARATIVE DATA

Leistritz L4MG410	**Case 1**	**Case 2**
Flow volume (m^3/h):	2,665	3,230
Inlet pressure (bar):	3	3
Discharge pressure (bar):	34.5	34.5
GVF (%);	98.5	98.5
Power (kW)		
MPP without hydrocompressor	2,986	3,567
MPP without hydrocompressor	2,385	2,848
Cost saving (€/pa)		
Electric drive	210,800.-	251,950.-
Diesel drive	421,600.-	503,900.-



YOU NEVER PUMP ALONE.

Leistritz Global Pump Services for your Peace of Mind.

Commissioning, support in operation

Leistritz Service is streamlined to meet the demands of your sites all over the world. We have your operations in view using state-of-the-art digital technology – supported by a global network of qualified partners close by. Our engineers support you in your production run to guarantee punctual start up and hassle-free operations. We train your operators hands-on. And on the job. Our service is yours to keep your production lines running as smoothly as clockwork.

Training, Services, Maintenance and Spare Parts

Home base for our global oil and gas operations is our special industry unit in the UAE. International service and support is provided from Service Stations in Nuremberg, Milano, Somerville, Chennai, Sharjah, Shanghai, Taicang and Singapore. That's Germany, Italy, USA, India, the United Arab Emirates, China and, of course, Singapore.

At a glance

- Planning and design
- Plant commissioning
- Process optimisation
- Modernisation / upgrades
- Customer training
- Extended Warranty
- Support hotline
- Maintenance
- Digital / remote services
- Repair services
- Spare parts

pumps.leistritz.com/en/service

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LEISTRITZ Pump Technology

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Distributor network
for regional and local service

LP-35 en 10/21 500 en