plications (accessories are required for some pumps). The oil carried with the process gas is roughly separated in the oil box before the discharged gas enters the integrated exhaust filters where the fine oil mist is trapped. The thus filtered oil is collected in the oil box and then supplied back to the pump. The separating system optimised in consideration of all operating conditions for the vacuum pump guarantees – also at high intake pressures and when pumping out of vapours – an exhaust gas which is free of oil mist (separation efficiency over 99.9 %).

The pumps have been so designed that efficiency of the pumps will be high. For the SV 10 B through SV 65 B, the motor and pumping section use the same shaft. For the SV 100 B to SV 1200 the motor is linked depending on requirements to the pumping section directly via a coupling or via V-belts as a pedestal motor. All vacuum components like anti-suck back, exhaust filter with oil return line needed for a complete vacuum unit as well as the optimised placement of all controls and monitoring components allow for an extremely compact unit.

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KAMAT – company portrait

KAMAT is one of the most innovative manufacturers of high pressure plunger pumps – not only for Triplex, but also for quintuplex plunger pumps.

Based on a wide spread modular system KAMAT can supply more than 7000 different pump configurations from 4–3500 l/min and 15–800 kW in the two standard material specifications (stainless steel 1.4313 and duplex steel 1.4462). The standard KAMAT pump programme covers already 90 % of the incoming specifications. This is possible because different gear boxes for different power inputs and different pump head versions in combination with different plunger sizes can be recombined without any adaption. In addition to this vast standard programme, KAMAT is able to offer and manufacture special pumps for aggressive and abrasive fluids made from highly resistant materials like nickel-based alloys.

Naturally the KAMAT pump programme covers also API674 and ATEX versions as well as special acceptance procedures which are performed on the KAMAT test bed.

The most recent innovation step is the launch of a pump family designed for abrasive fluids up to 1000 bar discharge pressure. The application of these pumps is found mainly in high pressure injection in the oil- and gas industry. The pumped fluid volume can reach up to 3500l/min depending on the discharge pressure.

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Universal Cargo Pump for high and low viscosity cargos

Task

Usually standard deck installations of cargo screw pumps are not able to satisfactorily unload the full range of cargo viscosities in tanks with depths of more than 7 to 8 metres. Such installations cannot provide the operating and suction conditions necessary to avoid cavitation effects during unloading and stripping. Furthermore other standard submerged pump types are normally not able to provide proper stripping and draining of the tank and suction lines.

Solution

For this task the German pump manufacturer Leistritz Pumpen GmbH has developed a submerged cargo pump. For example, it is installed in a separate barrel, normally hanging from the deck in the aft cargo tank. The installation inside the barrel replaces an otherwise required pump room. The barrel works as a large suction chamber providing the pump with additional suction ability. As alternative, a direct tank installation without barrel is also possible for the pump. The Leistritz Cargo Pumps have only one shaft seal (stuffing box or mechanical seal) to the atmosphere. They are suitable for handling hydrocarbon products and other viscous liquids including slightly abrasive and corrosive fluids. Their special screw profile provides for a continuous, almost pulsation-free pumping of cargo liquids at low power consumption. As the installation in a barrel with the suction line flange connection is placed above the inlet to the pump, the entire pump is flooded by the pumped liquid even without tank filling levels. Due to this configuration, the pump handles entrained air and gases without vapour locking or losing prime. It is recommended to provide heating for the pump in asphalt operation using heating coils in the pump suction area in the barrel as well as a heating jacket for the stuffing box. With normally at least two pumps installed in a barge, each pump can be designed with full unloading capacity to achieve sys-

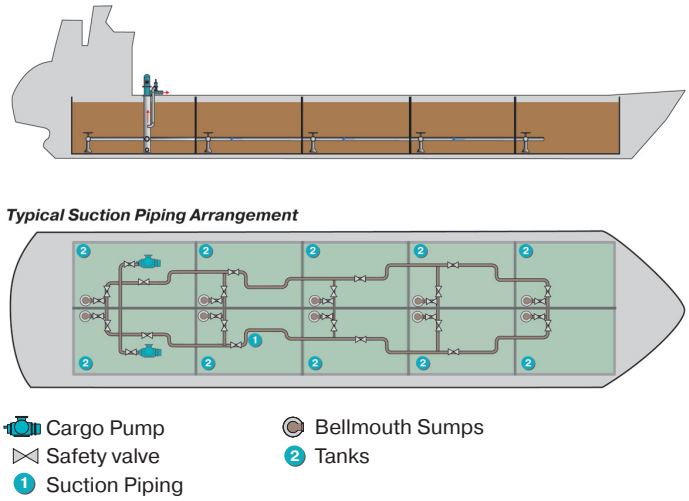

Fig. 1: Schematic representation of piping

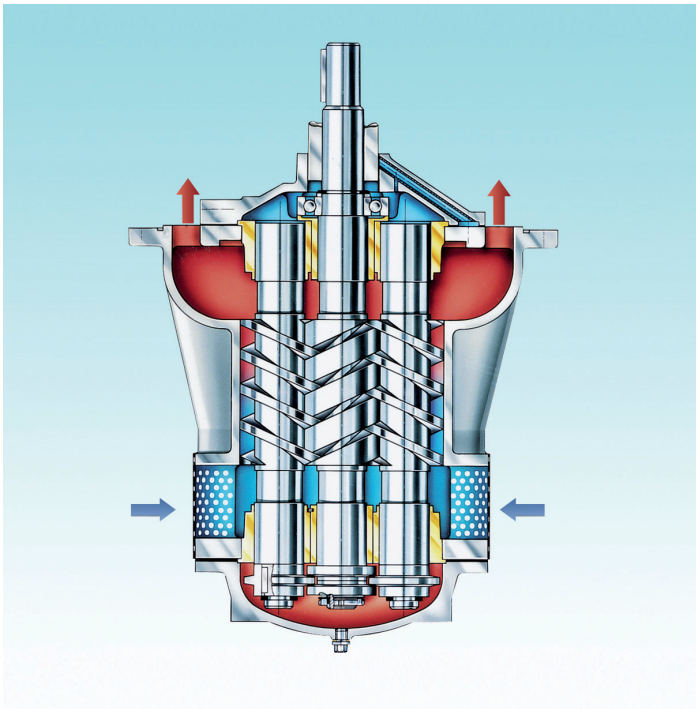

Fig. 2: Sectional view of the pump

tem redundancy. With the layout of the suction piping system any of the pumps can service any of the cargo tanks. The pumps can be driven either by a diesel engine through a right-angle gear connected to the vertical drive shaft or by an electric motor. By varying the pump speed the pump flow can be controlled. This helps to strip the line and tanks in order to optimize the total cargo discharge time. An electric motor with frequency control can also be used.

Benefits of the Leistritz Cargo Pump

- Effective stripping of tank and suction lines
- Up to 40 % more efficient than a centrifugal pump
- Hydraulically-balanced rotors eliminate upthrust problems
- Supplied for retrofit or as complete unit
- Suitable for several viscosities from kerosene to asphalts
- No need of timing gears and special lubricated bearings
- Spring-loaded sway braces to reduce vibration and wear of shaft and column
- Available with right angle gear head for several drivers (e. g. e-motor, hydraulic motor and/or diesel engine)

Operating data

- Differential pressure range L2-Pumps: max. 16 bar (232 psi)
- Differential pressure range L5-Pumps: max. 10 bar (145 psi)
- Capacity L2-pump: max. 900 m^3/h (3,960 GPM)

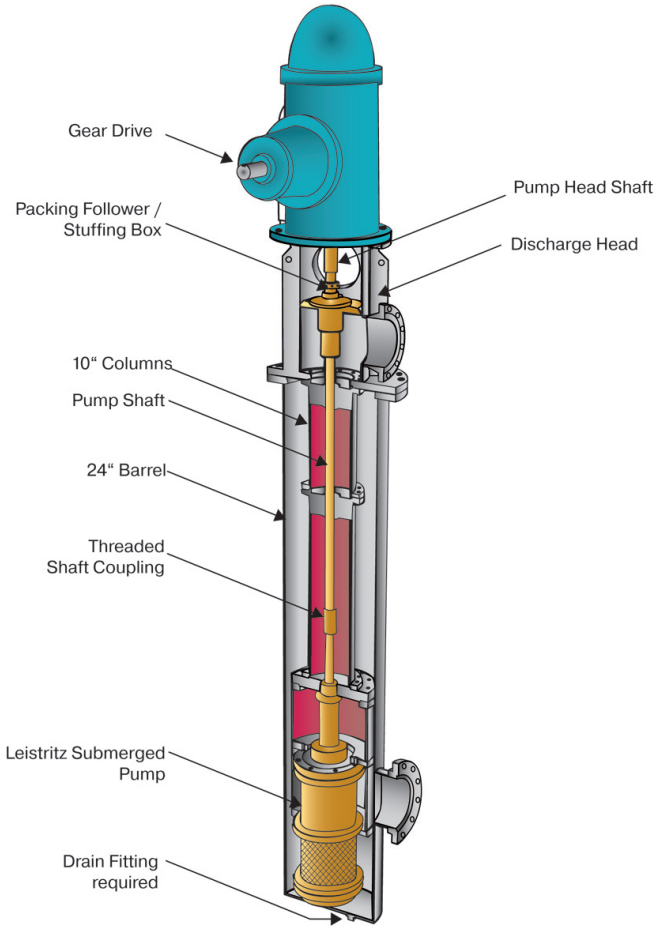

Fig. 3: Sectional view installation tube with pump

- Capacity L5-pump: max. 1,700 m^3/h (7,500 GPM)
- Viscosity max. 100,000 mm^2/s
- Temperature max. 280°C (536°F)

References of pumps already in worldwide operation

- Size “L5NT-164/200...” and “L5NT-164/180...” running on 15 vessels as “asphalt and fuel barges”
- Size “L2NT-116/190...” running on 8 vessels as “product tanker fuels, LO, F and JP-5”
- More than 90 different L2/L5 pump variations and applications, operating on several vessels and ship terminals especially for asphalt, fuels and/or lube oils in loading, offloading, transfer or blending jobs

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