



KelairPumps

PumpAction..... Issue 51 Jun 08

Case Study

Viking liquid abrasive pump a success in diatomaceous earth pumping

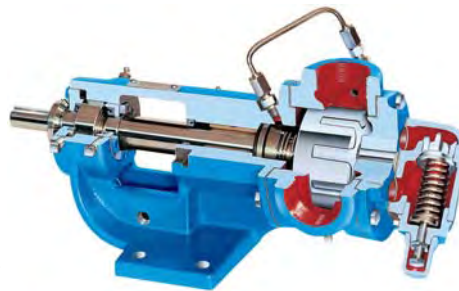
Sales Engineer Frank Molinaro VIC

Diatomaceous earth has long been a difficult product to pump due to its very abrasive nature.

This is why a leading bio-fuels manufacturer in Melbourne has chosen a Viking Model L4625 to use in this application.

Previously the customer was using a non-Kelair old spur gear pump. The problem the customer was finding with this type of pump is that the abrasive nature of the diatomaceous earth causes wear, leading to continual leakage

from the gland seal area. Additional to this the internal components of the pump were being worn away over a relatively short time adversely



affecting the performance of the pump during operation.

As the product application required a small flow and high head the customer wanted to stick to a positive displacement pump. After some discussions with Kelair they elected to replace this

pump with a Viking L4625 Liquid Abrasive pump.

The appeal of using this pump is that it has a behind-the-rotor mechanical seal design so the shaft and bearings behind the rotor do not see any of the product.

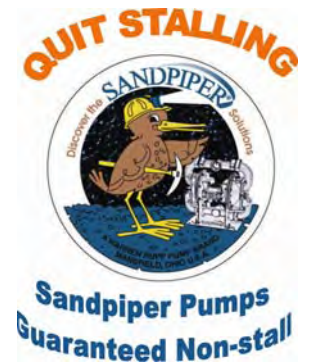
The pump also has Tungsten Carbide idler pin and idler bush and Silicon Carbide vs Silicon Carbide single mechanical seal.

By using these special materials all the normally wearing components are up-graded to become abrasive-resistant so the pump can work more reliably, for a longer period of time

Products

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- Steam Turbines
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Selection parameters for air-operated diaphragm pumps

The information detailed below is of a generic nature only and is to provide some general guidelines. It is not to be used for specific application selections. Data may vary between different manufacturers and readers should make their own specific enquiries to ensure proper selection of equipment

TEMPERATURE

This section provides general information on temperature limits for various materials used in the manufacture of air operated diaphragm pumps.

Metals

Temperature capabilities of metals are such that the determinant components for temperature limits are elastomers and plastics.

Plastics

Polypropylene	0° to 82° C
PVDF also known as Kynar	-18° to 120° C
Nylon	0° to 82° C
Conductive Acetal	-29° to 88° C
Teflon PFA	0° to 105° C

Elastomers

Buna N	-23° to 88° C
EPDM	-40° to 138° C
Hyrtel	-29° to 104° C
Neoprene	-23° to 93° C
Santoprene	-40° to 135° C
PTFE	-37° to 104° C
Flourocarbon (Viton)	-40° to 177° C

ABRASION RESISTANCE

The information in this section compares abrasion resistance of different materials in terms of good, satisfactory and low.

Metals

Aluminium	Satisfactory to good
Stainless Steel	Good
Cast Iron	Good
Hastelloy C	Good

Plastics

Polypropylene	Satisfactory
PVDF also known as Kynar	Satisfactory
Nylon	Satisfactory
Conductive Acetal	Satisfactory
Teflon PFA	Low

(Abrasion Resistance Cont.)

Elastomers

Buna N	Satisfactory
EPDM	Low
Hytrel	Satisfactory
Neoprene	Good
Santoprene	High
PTFE	Satisfactory
Flourocarbon (Viton)	Low
Rupplon (Urethane)	High

CHEMICAL RESISTANCE

Numerous Chemical Resistance Charts are available and these, in addition to personal experiences, should be used to select materials of the various components. A copy of the Warren Rupp Chemical Resistance Chart is available by [clicking here](#)

ELASTOMER FLEX LIFE

By its nature, all diaphragms are considered wearing items and specific defined life of diaphragms cannot be provided. Issues such as mechanical flex life, chemical resistance, temperature and operating pressures all influence diaphragm life. Testing in water simulates mechanical fatigue without other impacts and the relative flex life with Neoprene as 100 is as follows:

Buna N	35
EPDM	50
Hytrel	75
Neoprene	100
Santoprene	100
PTFE	75
Flourocarbon (Viton)	33
Rupplon (Urethane)	75

SOLID SIZE CAPABILITY

This information is relevant to Warren Rupp Sandpiper pumps only.

Standard Construction Ball Valve Pumps

Maximum Solid Size

Size	Metal Pumps	Plastic Pumps
PB¼		1mm
S05	3mm	3mm
S07		4mm
S07T		9mm
S10	4mm	4mm
S1F	6mm	6mm
S15	6mm	12mm
S20	6mm	17mm
S30	9.5mm	18mm

Heavy Duty Ball Valve Pumps

Size	Maximum Solid Size
HDB1	6mm
HDB1½	6mm
HDB2	9mm
HDB3	22mm
HDB4	22mm

Heavy Duty Flap Valve Pumps

Size	Maximum Solid Size
HDF1	25mm
HDF2	50mm
HDF3	80mm
HDF4	80mm

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Sandpiper Features and Benefits

- Non-stalling guarantee
- Cross-drilled technology, to eliminate stalling
- ESADS (Externally Serviceable Air Distribution System), allowing repair of pump without removing from pipeline
- Fully-bolted design, minimising repair time and reducing maintenance cost
- Lubrication-free, eliminates requirement for lubricators, reducing initial cost and maintenance cost