



TSURUMI PUMP

Application Reports - Issue No. 1 - November 2001

Tsurumi Manufacturing Co. is the world's biggest manufacturer of electrical submersible pumps.

Tsurumi's Kyoto Plant is the world's most modern submersible pump manufacturing plant.

Total manufacturing capability: 1.000.000 units per year.

Established in 1924 Tsurumi is one of the most experienced pump manufacturers.

Tsurumi is quality and durability.
Pumps for professional use.

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Schwarzbach pipe heading



The Project:

Gelsenkirchen pipe heading, Schwarzbach canal, Germany

Executing company: WÜWA Bau GmbH

The Problem:

The material excavated by the micro-tunnelling machine is pumped by a mud pump into a separating system where coarse parts are

separated. The remaining highly abrasive sludge is passed into a receiver. The material deposits due to the intermittent operation of the pump.

Our Solution:

A KRS2-80 with agitator whirls up the abrasive sludge so that it can be pumped off without any problem. Minimum wear is possible due to the application of components of grey cast and chromium cast iron (25% chromium portion).



In the event of abrasive and corrosive utilization, stronger wear and tear will take place naturally in certain components. With regards to the above application wear and tear can take place mainly in impeller, agitator, suction plate, shaft sleeve, oil ring, mechanical seal, pump casing, strainer, motor casing and discharge coupling. Depending on the working conditions the lifetime of those parts might vary significantly and can be shorter than the legal warranty period.
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Ingrid tunnel - Velbert



The Project:

Extension of the L433 road Velbert/Langenberg tunnel, Germany

Executing company:
Wayss & Freytag Ing. Bau AG

The Problem:

The ground water must be pumped off. Continuous truck traffic has to be ensured due to the traditional excavation by means of building machines, i.e. pollution by mud must be prevented by continuously pumping off in pumping on snore mode.





Our Solution:

Lowering the ground water table by means of contractors' pumps of the KTZ and KTV series. Our pumps are provided with a patented oil lifter which ensures lubrication and cooling of the mechanical seal even at a minimum oil level.

Twenty-four-hour pumping on snore mode without failure has been implemented for months now due to this particular feature.

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Copper mine Yanacocha - Peru

The Project:

Minera Yanacocha is operating several gold and copper mines in Peru. The "stage 7 project" comprises the exploration of a new copper mine.



The Problem:

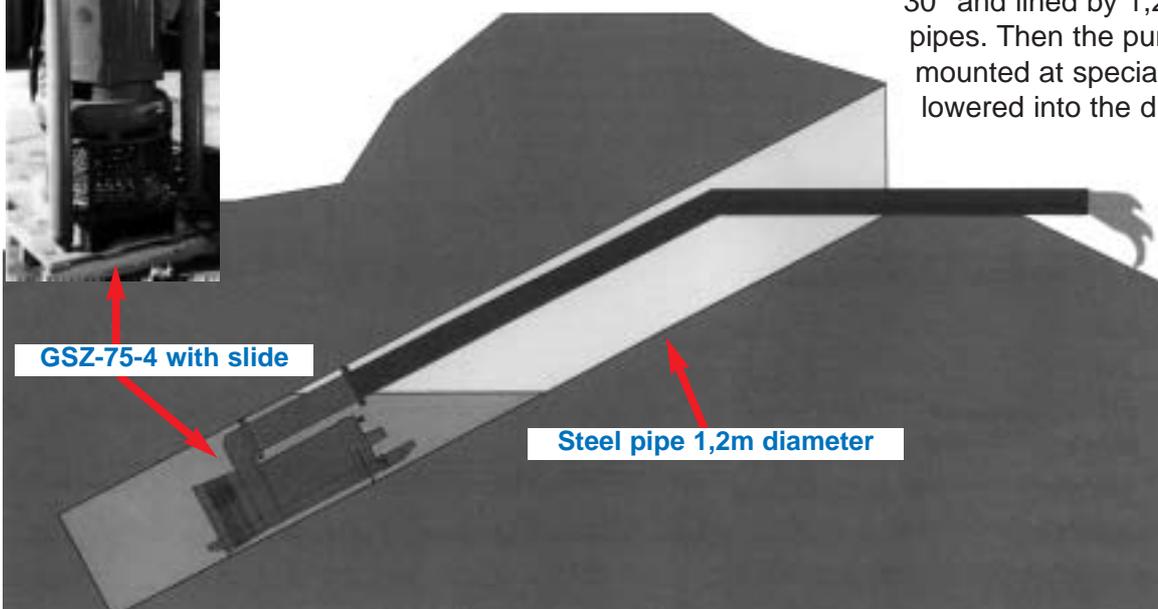
Pumps Plus (Denver, USA) was employed by Bechtel International Corporation to lower the ground water of the "stage 7 project".



Our Solution:

21 submersible contractors' pumps, type GSZ-75-4, 75kW each, were used.

Ducts were drilled at an angle of 30° and lined by 1,2m dia. steel pipes. Then the pumps were mounted at special slides and lowered into the duct.



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Essen Grugapark



The Project:

New construction of Essen Grugapark, Germany

Executing company:

Hochtief Building

Equipment provided by Streif Baulogistik

The Problem:

The ground water and collected surface water must be pumped off.

Our Solution:

The water is pumped off via a 200m long hose line by a KTZ45.5 which is installed horizontally for space reasons.

Sufficient capacity reserves are available even in case of heavy rainfall.



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Essen-Kettwig sewage treatment plant



The Project:

Activated sludge tank for Essen-Kettwig treatment plant, Germany

Executing company: Hochtief Civil
Equipment provided by Streif Baulogistik

The Problem:

The surface water collected at the concrete floors must be pumped off completely over a wide area.

Our Solution:

A type LSC-4 residue water pump allows to suck off the surface water up to 2 mm. The check valve installed below the impeller enables continuous self-priming pumping on snore mode.



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Böhringer Ingelheim Pharma KG - Biberach



The Project:

Construction of a new production facility
Böhringer Ingelheim Pharma KG in Biberach a. d.
Riss, Germany

Executing company:
Hubert Schmid Spezialtiefbau GmbH

The Problem:

Lowering the ground water by several collection
sumps surrounding the construction site.

Our Solution:

KTZ67.5 in pumping on snore mode. The
superior quality of the Tsurumi pumps is
highlighted by an operation without failure and
malfunction.

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Bramschstrasse tunnel - Dresden

The Project

North-tangent Dresden-Gorbitz,
Bramschstraße Tunnel, Germany

Executing company:
MAX BÖGL group of companies
Postfach 1120
D-92310 Neumarkt
info@max-boegl.de
www.max-boegl.de



The Problem:

The tunnel lies in the ground water over its whole length. No free water table exists near the tunnel, the flow-in quantities depend on the distribution of the local flow quantities from top and vertical joints which extend as far as the main ground water course.

Our solution:

KTZ35.5 is used in 24-hour pumping on snore mode. Because cement sludge and abrasive media are pumped here it is necessary to apply a highly wear resistant pump.



After 11 months of operation (November 2000 till September 2001) the pump did not show any major sign of wear:





the oil is clear as before

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Dülmen micro-tunneling



The Project:

Dülmen channel construction - micro tunneling, Germany

Executing company:
Fa. Jordan Tiefbau GmbH & Co. KG
Kierdorfer Str. 65
D-50169 Kerpen

The Problem:

The soil loosened at the front when heading is returned to the pressing pit and must be removed here and disposed.

Our Solution:

The viscous concentrated soil could be sucked off by a KTZ pump with "suction hat" (reversed inlet strainer).

The specific advantage was the operation of the



pump which could be used also during pressing. Transporting off was simple as it was possible to pump the drilling material directly into the containers provided. No tank truck was necessary.



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Open-cast gravel mining

The Project:

Open-cast gravel mining, Lutzensömmern, Germany

Executing company:
Moos Kieswerk + Recycling GmbH
Schwerstedter Str. 59
D-99955 Lutzensömmern



The Problem:

Viscous sludge is generated when mining gravel in the open-cast mine which must be pumped off.

Our Solution:

A type KRS2-150 Tsurumi pump with agitator passes the abrasive viscous sludge to an abandoned mine at a distance of 125m. The agitator ensures powerful whirling of the sludge, solid cast iron/chromium cast iron minimises wear.



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Saline ground water



The Project:

Saline water pumping by means of vacuum systems, Spain

Executing company:

Fa. Ischebeck Iberica s.l.

Pol. Ind. El Oliveral, Calle S, n 25

E-46190 Ribaroja del Turia



The Problem:

Extremely saline warm water (ground water contaminated by seawater) attacks conventional pumps of aluminium to a considerable extent which results in excessive wear which cannot be prevented by installing sacrificial anodes.



Our Solution:

An essentially longer service life can be reached by Tsurumi KTZ-pumps of grey cast material. Corrosion due to saline water is nearly excluded.

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Pipe heading Aakerfährrstraße



were employed which burdened the mains electricity supply excessively. As the river Rhine flows past at a distance of 200 metres the groundwater could only be lowered with difficulty.

Our Solution:

A pump of type KRS2-89 incl. hosepipe and 300m drainage in the form of a pipe. Draining of the excavation for the whole construction period. Operation of the pump in 24-hour pumping on snore mode.

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The Project:

Pipe heading DN1200 Aakerfährrstraße, Duisburg, Germany

Executing company:
Siebert Bauunternehmung GmbH, Bebra

The Problem:

Lowering and maintaining the groundwater table. At the beginning several medium-sized pumps



Pipe heading St. Petersburg



is added via a venturi nozzle mounted on the pipe. Very heavy wear due to bentonite.

Our Solution:

1x KTZ45.5 for 24h continuous operation. This pump has been running since July 2001 without breakdowns and without any visible wear.

The Project:

Long-distance pipe heading, protective leg for oil pipeline, St. Petersburg, Russia

Executing company:
Herrenknecht AG, Schwanau

The Problem:

For the operation of the mix shield a bentonite suspension is mixed in a container. A pump circulates the mixture via a pipe circuit. Bentonite



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External fire-fighting water supply



For this they are intended to have a performance of 2x 800 litres/min at 1,0-1,5bar supply pressure. Only an 8kVA generator is available as power supply.

Our Solution:

2x KTV2-37 provide exactly the required capacity and supply pressure. Thus Dossenheim fire brigade has two portable (35kg), high quality and long-life pumps at their disposal that are reliable even under extreme loads.

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The Project:

External fire-fighting water supply by means of submersible pumps

Executed by:

Dossenheim voluntary fire brigade, Germany

The Problem:

Two submersible pumps are to ensure the external fire-fighting water supply to the fire-fighting centrifugal pump FP16.



Cologne/Bonn airport connection



Our Solution:

Installation of 2 submersible pumps KTVE21.5 and KTVE22.2. The advantage here is in the integrated level control unit via electrodes. A separate floater cable does not have to be laid. The space required is determined by the diameter of the pump. In contrast to floaters, electrodes do not have to be readjusted. The level can be varied without any difficulty by mounting a screw.

The Project:

Connection of the newly built road for Cologne/Bonn airport

Executing company:

Heitkamp GmbH, Wayss&Freytag AG, Trapp GmbH

The Problem:

Maintenance of water level in a rainwater storage basin at the building site.



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Latest Technology and Highest Quality

A - Tsurumi stuffing box - absolutely watertight



The stuffing box is located at the cable entry section and takes the part of sealing off water. As the cable conductors consist of twisted wires, water may penetrate into the motor by the capillary phenomenon when cable sheath or insulation is damaged or when the end of the cable is submerged. The construction is such that a certain part of the insulation of each conductor is peeled and filled with rubber or epoxy resin for the complete sealing.

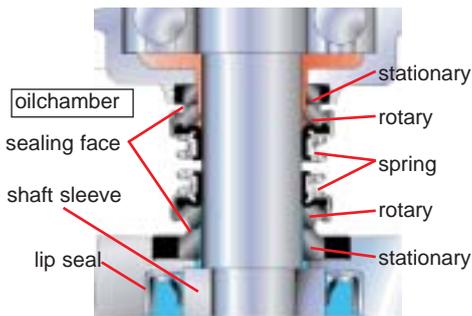
B - Continuous use under dry run (“on snore”)

Located directly above the motor windings, a snap-action self-resetting bi-metal device cuts off voltage from all three phase windings simultaneously if the current is too large in one, two or all three windings, or if the windings get too hot.

Tsurumi enables measurement of winding resistance and insulation from the far end of the cable, without ever removing the cover from the motor in the field.

C - Double mechanical seal in oil bath

All Tsurumi pumps dispose of a double sealing systems for extended lifetime:



1. A shaft sleeve in connection with a special lip seal protects the mechanical seal from particles - abrasive particles are expelled back into the flow - they don't have contact with the mechanical seal at all !!

2. All Tsurumi contractors' pumps - even the 400W class - have double mechanical seals inside an oil both. The seal material is Silicon Carbide - no other has greater hardness. Resistance to temperature fluctuation and corrosion is also the best available.

D - Increased wear resistance of pump casing and impeller

As contractors' pumps are used in unpredictable circumstances, Tsurumi has gone a long way towards making the impeller capable of the impossible and towards providing spare motor power to match.

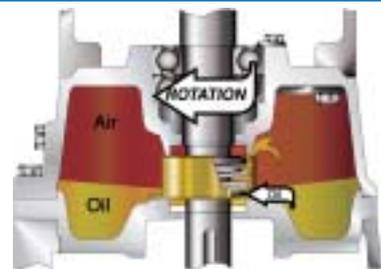
Tsurumi contractors' pumps are used extensively for bentonite mud, often with earth in the case of the models fitted with an agitator.

E - Ball bearings of highest quality

Due to the high quality of the shaft and the bear rings all pumps can be run horizontally when entirely submerged.

Oil Lifter

A special patented guide vane is attached inside the oil chamber. With the motor rotation oil is pumped up. Therefore even at low oil level lubrication and cooling of the mechanical seal is secured.



We reserve the right to change specifications and designs herein for improvement without prior notice. Our pumps are for professional use only. In the event that Tsurumi (Europe) GmbH have, in exceptional cases taken over, a manufacturer's warranty, this entitles the end-user to assert remedy free of charge against Tsurumi (Europe) GmbH due to any defect to the product occurring during the guarantee period (see below), also then when the warranty claims against the seller do not or no longer exist. In the event of malfunction, which is attributable to the improper handling by the enduser, no guarantee claim shall arise. Further claims shall not result from the warranty, unless if something to the contrary has explicitly been determined. The decision as to whether remedy is effected by way of replacement or repair shall be at the choice of Tsurumi (Europe) GmbH. The claims shall be time barred after a period of three months after expiry of the guarantee period, however, not before expiry of the warranty period which is valid towards the seller. In the event of doubt, the warranty period shall correspond with the warranty period which is valid between the end-user and his seller.

Tsurumi (Europe) GmbH

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