

Case Studies



User: Petrodar Operating Company
Project: Melut Basin Oil Development Upstream, Sudan

Pumping equipment to transfer diesel fuel and crude oil.

Materials

- A216 Carbon Steel
- UNS 39276 Super Duplex Stainless Steel

Motor

ABB EEXDE 11 BT4

	min	max
Flow Rate (m ³ /hr)	1.5	35
Pressure (bar)	5	12



User: Doodeh Sanati
Contractor: Sadid Jahanti
Project: Carbon Black Plant Saveh, Iran

Pumping feedstock oils and molasses from storage, unloading and daily process holding tanks.

Materials

- A216 Carbon Steel
- API 682 Mechanical Seal
- Spacer Couplings
- A216 Cast Steel Valves
- Welding to ASME IX

Motor

Euro MOTORI EEXDE

Flow Rate (m ³ /hr)	60
Pressure (bar)	6

Quality Standards

- ISO 9001/2000



Spare Parts and Support

A full recommended spare parts list is provided with each pump unit. In addition our Services Division provide a comprehensive range of options for pumps and motors, complemented by a vast spares warehouse, ensuring that your business processes are uninterrupted and running at optimum levels at all times.

For more information please visit our website or email sales@varleypumps.com or telephone one of our engineers on +44 (0)1582 731144



VARLEY

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Varley Pumps Ltd are part of the Hayward Tyler Group

HT/API676/0408-02



Positive Displacement Pumps - Rotary API 676

Varley Pumps, part of the Hayward Tyler Group, manufacture a range of **double helical gear pumps** in accordance with the requirements of API 676 utilising API 682 shaft sealing systems when required. **This range complements the popular standard product** and draws on the extensive knowledge gained in oil transfer, process feed, and forced lubrication around the world. A full custom engineering service is available to design products to international standards or client specifications.

Key Applications

- **Oil Transfer**
Crude, Heavy, Distillate, Diesel, Lubricant
- **Process Feed**
Feedstock, Additives
- **Forced Lubrication**
Compressors, Diesel and Gas Engines, Draught Fans, Process Pumps, Turbines
- **Seal Flush Systems**
Process Fluid, Barrier Fluid

Key Benefits

- Low operating cost
- Long-term reliability
- Engineered for the application
- Ease of maintenance
- Low pulsation design

draws on the extensive knowledge gained over 50 years

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The Range

The API 676 range is based around the proven double helical gear pump design and benefits from its inherent **reliability**. By employing modular design, the central mounting arrangement can accommodate either electric, hydraulic or air motors and different capacity pump ends.

The foot-foot design incorporates spacer couplings that allows for the mechanical seal to be serviced without removing the pump or the need for re-alignment.

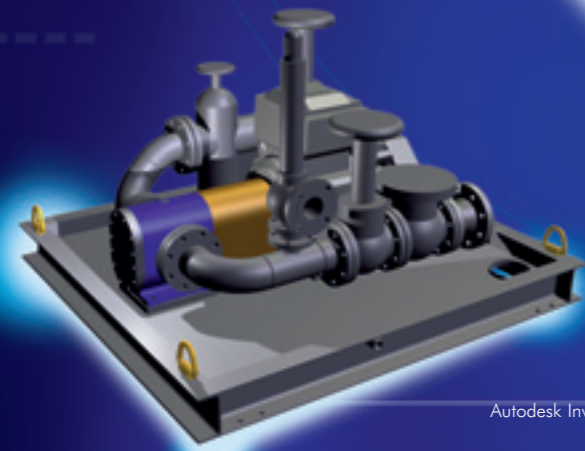
All units come supplied on either a slab baseplate or a fabricated hollow baseplate ready to be grouted in place.

Design

Varley design using a 3D CAD system. These can be used by the system designers to agree space and connection constraints.



Finished unit for Macro International, Dubai



Autodesk Inventor solid model

Pumping Principle

The pump contains two double helical gears that run on fixed centres. The rotary action of the driver gear is transferred to the driven gear at the gear mesh line. As the gear has a 30deg helix angle, there are multiple meshes per shaft revolution, compared to the single mesh of a spur gear pump. These multiple mesh's give the output fluid a smoother pressure ripple.

The rotary action of the gear causes a depression in pressure within the tooth form, which draws fluid into the gear tooth. When the tooth rotates to one revolution to the discharge side of the pump, the mesh line acts as a seal and forces the fluid into the discharge port. The only part of the pump that is subject to discharge pressure is the discharge port.

Each shaft is supported by full complement roller bearings on either side of the gear and selected to give the highest possible Lb10 life.

multiple mesh's give the output fluid a smoother pressure ripple

Positive Displacement Pumps - Rotary API 676



Ancillaries

Pump ancillaries are chosen from reputable suppliers such as ABB, WEG, Crane, Fluiten and Burgmann, ensuring that the motor or seal meets or exceeds the project requirement.



Operating Parameters

Capacity	0.14M ³ /H – 250M ³ /H
Viscosity Range	Up to 15,000 Secs Redwood No. 1
Suction Pressure	Up to 100 bar
Temperatures	Up to 180° C

Standard Materials

- Pump Casing – ASTM A216 WCB
- Shafts – Carbon Steel BS970 EN36B / (655 M13)
- Gears – Carbon Steel BS970 EN9 / (070 M55)
- Elastomers – Nitrile Rubber / Viton / PTFE
- Mechanical Seals – Stainless / Carbon / Viton
- Bearings – Full Roller Bearings

Alternatives

Pump Casing – SG Iron, 316 STST, Duplex
 Mechanical Seals – Ceramic / Ni-Resist / Viton / Carbide - Tandem - Balanced - Flushed
 Gland Packing – PTFE Impregnated Yarn
 Bearings - Tungsten Carbide, Bronze PB4, PTFE Impregnated Wrapped Bush
 Gears - 316 STT, Hard to C50, Bronze, Duplex STST