

## Oil Products Pipeline Ltd.

### Haifa Boosting Station

**SPECIFICATION**  
**No. 2334-SP-PMP-001**

**For**

**Centrifugal Pumps**

P2	I.M.	12.02.24	FOR APPROVAL	I.M.	I.M.	
P1	I.M.	29.10.23	FOR APPROVAL	I.M.	I.M.	
<b>REV.</b>	<b>BY</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>CK'D</b>	<b>MRS</b>	<b>CLIENT</b>
					<b>APPROVAL</b>	


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## 1. General

The Haifa Oil Products Pipeline Ltd. requests suppliers to submit bids for 1 (one) centrifugal pump. This specification covers the requirements for the supply of this pump. The pump will be used as an auxiliary to pump product from Bazan storage to a pumping station within the compound.

The pump shall be Vertical Bowl Assembly type installed in suction well and designed for outdoor service. The pump to be suitable to handle a range of hydrocarbon liquids from gasoline to a light gas oil.

## 2. Scope of supply

→The vendor's scope of supply will be one (1) centrifugal pump with motor per the datasheets in Appendix "B". The impeller of the pump selected should **not** be the maximum sized impeller for the model chosen.

The Pump & motor is to be chosen based on the datasheets in Appendix "B". The vendor is requested to supply pump curves for the operating point and for the maximum impeller for the model chosen. The motor supplied shall be for the maximum impeller at end of its curve. This will allow the purchaser to upgrade the system for a higher throughput without changing the motor. The Pump speed will be 1480 rpm. ←

The vendor shall supply all the pump parts, including and not only, the bowl assembly, suction well (suction can), pump head and all the internal connections and process connections.


The vendor shall supply all items and accessories as specified below:

Certified drawings and documents, including assembly, dimensional and sectional drawings, as specified in Appendix "C".

Installation, operation, and maintenance manuals shall be prepared as specified in Appendix "C".

The vendor is responsible for the packing and delivery of the pump to the site (Haifa).

The vendor shall supply a list of recommended spare parts

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### 3. General requirements

#### Specifications

A partial list of the applicable specifications is listed below. The vendor to state any exceptions to the specifications listed:

1. API 610 – Latest Edition
2. API 682 4th edition 2015, Shaft Sealing System for Centrifugal and
3. Rotary Pumps.
4. ANSI/ASME B16.5, Pipe Flanges and Flanged Fittings.
5. ANSI/ASME B16.20 Metric Gasket for Pipe Flanges.
6. ASTM A193/A193M Standard Specification for Alloy-Steel and Stainless-Steel Bolting for High Temperature or High-Pressure Service and Other Special Purpose Applications.
7. ASTM A194/A194M-18 Standard Specification for Carbon Steel, Alloy Steel, And Stainless-Steel Nuts for Bolts for High Pressure for High Temperature Service, Or Both.

Should there will be conflict between the requirements, data sheet , specification codes and standard the supplier shall obtain a written clarifications from the client before proceeding . The supplier shall identify and mark and any deviation, demands or requirement which he is unable to comply.

#### Reference List

The vendor shall provide, with bid, a reference list of pumps operating in similar service.

Duty

Pump duty points shall be according to the datasheets in Appendix "B". Turn up from normal to maximum flow should require a minimum of recycle.

Pumps shall be able to operate in parallel.

Pump H-Q curves shall be gradually sloping in one direction with maximum head at the "NO FLOW" condition. The normal operating flow/head point shall be 10% below the maximum shut off pressure.

Counter clockwise rotation of vertical shaft when viewed from above is required.

Vendor to specify the time, which pumps can run at shut off condition.

Vendor to specify the minimum flow requirements, which should not exceed 20% of the design flow.

The characteristic curves to include the data for 100% impeller diameter.

The characteristic curves to include curves for head, NPSH required, efficiency and horsepower against flow.

Curves to be corrected for specific gravity and viscosity specified.

Spacer type coupling between the pump shaft and solid shaft of driver is to be all steel, flexible, adjustable type to comply with API Std. 610, section 3.2.

Pumps shall be fitted with thrust bearing.

Connections

Pump's Bowl Assembly together with the suction well to be installed in **existing casing** of the following dimensions:

Inner Diameter: 750mm

Depth: 1650mm

Pump discharge nozzles shall be flanged to 8" ANSI B-16.5, #150, R.F.

Pump suction nozzles shall be flanged to 12" ANSI B-16.5, #150, R.F.

Following pictures of on site installation location:




Existing casing for installation of the new pump (NPSHa given at the marked level):



Existing pumps installation for example:



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### Painting

Painting shall be to the manufacturers standard, all carbon steel surfaces shall be preferably epoxy painted or powder coated. Vendor shall submit his painting specification.

### Accessories

Pumps shall be supplied complete with all items and accessories necessary for their satisfactory operation, including the following:

The vendor will supply any lubrication system and fittings, including any piping, which may be necessary. Constant level oilers shall not be glass.

Vendor to supply any special tools required for maintenance and servicing.

The coupling between pump and motor includes a non-sparking guard.

→The pumps shall be supplied with single mechanical seals. The seals shall conform to API 610 seal plan 31. ←

The pump shall be supplied with API 682 double type mechanical seal manufacturer by John Crane or equivalent .

The mechanical seal shall be a complete unit including seal flush and external seal quench .

The replacement of the mechanical seal shall be done on both sides without having the need to disassemble the pump .


The unit shall include leak detection and alarm system contact .

Flange gaskets for cooling mechanical seal piping device shall be spiral wound type fitted with graphite

### Connection


- Suction and discharge branches shall be arranged inline flanges shall be raised face, class 150, according to ANSI B 16.5 . Suction line shall be of size 12", discharge line shall be of size 8".
- Gasket contact surface shall have serrated spinal grooves machined with a 0.8 mm' nominal radius rounded-nose tool producing a grooved pitch of 0.35-0.45 mm .'
- The resulting surface roughness of between Ra 3.2 and 6.3 micron .
- Any screwed pipe connections shall be to ANSI B2.1
- Auxiliary piping connection to the pump casing shall not be less than 3/4" and pipe thickness shall be not less than sch.80 .
- All valve shall be ball type



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### Painting

- All external surfaces, other than austenitic steel surface shall be coated by an Epoxy painting system with UV protection according to manufacturer standard .
- Dry painting shall be not less than 300 microns.

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### Baseplate

The pump and the motor shall be installed at common baseplate fabricated from heavy duty steel profiles, fitted with motor align devices

The pump shall have lifting lugs suitable for horizontal lifting.

### Coupling


The pump and motor shall be connected by "spacer" coupling and protected by non-sparking coupling guard.

The coupling materials should be resistible for liquid fuel.

The coupling shall allow complete removal of all parts as a unit, without removing the motor.

### Pump Design

- The pump impeller diameter shall not exceed 95% of the maximum impeller diameter allowed for the pump.
- The pump efficiency at the design point shall not be less than 75%.
- Pump shall be suitable for parallel operation
- The head performance curve shall rise continuously.
- The vendor shall quote the pump curve reference to diesel or gasoline including efficiency, power and NPSH.
- The pump duty point shall be to the left of B.E.P.
- The pump shall be selected that the duty points at the best efficiency point, at a satisfactory noise level (which should not exceed 85 dBa at 1 meter from the surface of the unit in the operating conditions) and without cavitation.
- The impellers shall be mounted on the shaft and dynamically balanced.
- Discharge head shall be fabricated of steel and hydrostatically tested according to API 610.

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- Oil lubricated system will include a sight level indication glass for checking the oil level
- All tapped holes shall be plugged including seal, vent and drain connection

### Materials

Materials of construction shall be according with API 610 standard recommendation table H-1, spec S-6

Pressure Casing: Carbon Steel

Shaft: AISI 410

Inner case parts: 12% chrome

Impeller: 12% chrome .

Case wear rings: 12% chrome .

Impeller wear ring: 12% chrome .


Casing gasket: Spiral wound 316 .

Material certificates: The vendor shall provide materials certification type including chemical composition and mechanical data EN 10204 3.1 type for all pressure contenting parts on pump .

Materials specification of all components listed in shall be clearly stated in supplier's proposal.

### Pump Weight

- The vendor shall quote the total pump, motor and baseplate weight as well as the main components weight such as but not limited: motor, pump fitted with all pump's axillary and the common base plate .
- No pump component such as motor; or the assembly of pump and baseplate shall weigh more than 3 tons each.

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### Nameplate

The pump and motor shall bear an individual nameplate of at least 16-gauge stainless steel. Nameplate shall follow manufacturer's standard and contain the following data:

#### Pump

Name of manufacturer	P-14
Year of manufacture	Model number
Important equipment data (working point, shut-off pressure, RPM)	

#### Motor

Name of manufacturer	Rated power (kW)
Year of manufacture	Insulating class
AORL item number	RPM
Model number	Enclosure

#### Packing

Prior to packing, the pump shall be cleaned both internally and externally, and the interior protected by a suitable rust preventative, and all openings sealed with either plastic plugs or plywood covers securely bolted to flanges. Pumps are to be dowelled to baseplate.


Vulnerable threaded parts are to be coated with anti-corrosive paste and protected by suitable tape.

Pump assemblies are to be packed and firmly fixed in wooden crates suitable for ocean shipment.

#### Tests

Tests to be performed as specified in the attached datasheets (Appendix B).

Test procedures shall be in accordance with American Hydraulic Institute standards.

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### Spare Parts

The supplier shall specify the spare part needed including the following:

- Body gasket cut with bolts holes, 1 set for pump
- Glass for lubricating bearing oil, 5 sets for pump
- Lubricant filter element, 10 sets

#### **4. Electrical requirements (Drivers)**

- 4.1 Vertical electric motor, three phase, cast iron, epoxy painted, squirrel cage, solid shaft, suitable for driving the centrifugal pump described under paragraph 3 for the complete range of the Q.H. curves and specific gravity of liquid handled, under environmental conditions as detailed in this inquiry.
- 4.2 The vertical electric motor shall comply with requirements of API Std. 610, paragraph. 3.1.
- 4.3 Power supply: 400V; 3 phase; 50 Hz; soft start starting at 300 to 400V.
- 4.4 Motor performance shall be according to IEC publication No. 34.
- 4.5 Motor dimensions shall be according to IEC publication No. 72-1.
- 4.6 Explosion proof for hazardous location to NEC 501, Class 1, Div. 2 Group D, temperature identification number T2C or EExdIIAT3 - EN50018.  
 Outdoors weather protected, at least IP55. Tropical insulation moisture and fungus proof, classes F or better; maximum temperature rises according to class B.
- 4.7 Winding ends are to be brought out to terminals in the terminal box.
- 4.8 Self-cooling by ambient air; positive precaution to prevent reverse mounting of fan.

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4.9 Information required with the quotation:

- 4.9.1 Motor rating at ambient temperature of 45°.
- 4.9.2 Efficiency and power factor curves.
- 4.9.3 Detailed description of motor construction, standards followed for manufacture, particulars as to kind of enclosure, class, group, etc.
- 4.9.4 Dimension drawing, typical cross-section and other relevant drawings.
- 4.9.5 Testing authority to certify the explosion proof and weather protected construction.


4.10 The motor shall be able to provide the following information:

- 4.10.1 Temperature of the upper seal. – 1 PT100 at least
- 4.10.2 Temperature of the lower seal. – 1 PT100 at least
- 4.10.3 Temperature of the coils. – 6 PT100, two for each phase

## 5. Documentation

The vendor's proposal shall be written in English and shall include all items specified in "Documentation Requirements", Appendix "C".

Manufacturers certificates are to be submitted giving details of all tests undertaken.

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## 6. Guarantee


### Mechanical

Unless the vendor in his proposal records exception, it shall be understood that the vendor agrees to the guarantees specified in items 1 and 2 below.

1. The vendor shall guarantee against defective materials, design, and workmanship all equipment and component parts for 1 year after being placed in service (but not more than 18 months after date of shipment).
2. If any mal performance or defects occurs during the guarantee period, the vendor shall make all necessary alterations, repairs, and replacements free of charge, free on board factory. Field labor charges, if any, shall be subject to negotiation between the Vendor and the Purchaser.

### Performance

The equipment shall be guaranteed for satisfactory performance at all operating conditions specified on the datasheet. Field checks on performance, when made by the Purchaser, shall be made within 60 days of initial operation.

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## Appendix "A"

### Site Conditions

Temperature:                    minimum 0°C  
    maximum 45°C


Relative Humidity:            minimum. 25%  
    maximum. 99%

Elevation:                        5 (m) above sea level

Site: Eastern Mediterranean terminal with corrosive industrial atmosphere, close to the shoreline. Sandstorms carrying fine dust are possible.


Rain Average:                    470 mm / year



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**Appendix "B"**

**Data Sheets**

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## Appendix "C"

### Documentation Requirements

Vendor's proposal as per paragraph 6.2.1 and 6.2.4 of API Std. 610.

The following table specifies the documents required at the various stages of supply.

Column A: Shows documents to be submitted with bids.

Column B: Shows documents to be submitted for approval with in two (2) weeks of the issue of the purchase order.

Column C: Shows final and certified documents to be submitted on delivery of the pump.

Item	Document	A	B	C
1	General outline dimensions	5		
2	Foundation requirements and loads		2	
3	Cross section of pumps with complete list of parts, parts description and material specification.	5		
4	Completed pump data sheets	5		
5	Performance data for pressure, power and flow	5		
6	Installation operating and maintenance instructions including allowable nozzle loads and moments			6
7	List of any special tools required	2		
8	List of spare parts recommended for two (2) years operation with itemized prices	2		
9	Test certificates			3

Note: number in table refers to number of copies to be transmitted.