ENERGY INFRASTRUCTURES Ltd

Terminal Kyriat - Haim

T-136

CRUDE TANK MIXERS SPECIFICATION

(Version 002)

SCOPE:

This document covers the technical requirements for design; fabrication, supply, and delivery of **Gear** Mixer that will be installed at Tank Nº 136.
The tank contains crude oil.
The mixer purpose: Blending tank product.

The tank was design according to API 650, checked and repaired according to API 653.
Attached are the following documents:

1. Mixer Data Sheet.
2. Tank's layout and the manhole's location drawing.
3. Nozzles dimension specification and floating roof legs orientation drawing.

The suppliers shall quote their offer for the mixers according to that orientation and sections
The vendor shall be the only responsible for the mixer work to guaranty a full blending procedure.

LIQUIDS PROPERTIES:

Example of fluid specification

Test	Unit	Method	Results
Density at 15 oC	kg/l	ASTM D 1298	0.9388
Viscosity at 80 oC	mm2/s	ASTM D 445	40.79
Viscosity at 80 oC	o E	Calculated	5.44
Viscosity at 50 oC	mm2/s	ASTM D 445	172.0
Water by distillation	mass %	ASTM D 95	0.20
Flash Point	oC	ASTM D 93/B	180.0
Flash Point	oC	ASTM D 92	210
Nitrogen	mkg/g	*ASTM D 5762	2300
Sulphur	mass %	ASTM D 4294	0.997
Pour point (upper)	oC	**ASTM D 97	Plus 15
P-value		SMS 1600	2.80
Bromine number on OVHD up to 360 o C	g Br2/100g	ASTM D 1159/1160	1.5
Vacuum Distillation (2 mm Hg)	vol %	ASTM D 1160	
recovered up to 360 oC		(Automatic)	7
Xylene equivalent		BP Method 230	11/15
Toluene equivalent	vol %	Exxon 79-004	15
Total sediment existent	mass %	IP 375	0.01
Total sediment accelerated	mass %	IP 390/B	0.01
Vacuum Distillation (2 mm Hg)		ASTM D 1160	
IBP	oC	(Automatic)	278
5 % recovered	oC		346
10 % recovered	oC		377
20 % recovered	oC		416
30 % recovered	oC		442
40 % recovered	oC		464
50 % recovered	oC		497
60 % recovered	oC		537
70 % recovered	oC		575
Recovered at 357 oC	vol %		6
Recovered at 583 oC	vol %		72
Seal Number of Stored Sample: 541 658			

SITE CONDITIONS:

1. Site altitude is about 2 m' above sea level.
2. Ambient temperature varies between 0^0C- 45^0C.
3. Relative humidity varies between 45% - 95%.
4. **The site is very close to the sea shore and corrosive industrial atmosphere.**
5. Rain falls around 550 mm' / year.

TANK DISCRIPTION:

1. Tank diameter: ~61 m'.
2. Tank height: ~ 20 m'.
3. Low legs position near tank shell: 1.30m'.
4. High legs position near tank shell 2.10 m'.
5. Distance from manhole center line to tank bottom plate: ~770-780 mm'.
6. Manhole Diameter: 30"

SIDE ENTRY VARI-ANGLE MIXERS Requirements:

1. **Technical Specification**:
   1.1 The mixer shall be a gear mixer type for rugged environmental installation fitted with two swivel hinge bearing angle option.
   1.2 The mixers shall be helical pitch type impeller for three dimension mixing action so to reduce work time, and to minimize the electricity demand.
   1.3 Each impeller shall be cast as one-piece component.
   The mixer shall be supply with swivel angle option sealed with hydraulic ball seal for zero leakage.
   1.4 All unit bearing shall be "grease pocket, sealed for life" capable for at least 40,000 hours of working.
   1.5 Materials:

Propeller:	ASTM A-536, Ductile Iron.
Shaft:	AISI 304, Stainless Steel.
Seal Mounting Flange:	ASTM A-36 & AISI 316L.
Mixer Frame:	ASTM A-48 Gr. 30.
Tank Adaptor:	ASTM A516 Gr. 70.

1.6 Paint: **Epoxy paint for Industrial areas with high humidity and aggressive atmosphere and coastal areas with high salinity environment**

Motor: IEC TEFC Eex. N, Category IIC, Temp T3,
ATEX/NEMA Complaint; 400V, 3HP, 50Hz, IP55, IE2 Efficiency. Motor manufacturer.

TAG AND MARKING:

The equipment shall bear name plate made of stainless steel.
The plate thickness shall be 1.5 mm'.
The plate shall contain the following data:

- Manufacturer name & country.
- Year of production
- Equipment model & Size
- Manufacturer item number.

PACKING:

1. All machined surfaces shall be greased.
2. All ports and opening shall be blanked off.
3. The goods shall be packed of in containers or wooden boxes with water repellent materials.
4. The package shall be suitable for export and capable of withstanding rough handing – marine package.
5. The vendor shall quote the list of all items in each box.

INSPECTION AND TESTING:

1. The vendor shall provide within 2 weeks from order all detailed, manufacturing program – time schedule.
2. The vendor shall issue formal test certification for all kind of performed tests.

GENERAL TERMS:

In order to evaluate the tender's quotations, the following information shall be given:

- Clearance dimensions from the tank floor and the floating roof bottom plate to the impeller.
- **Energy consumption for one hour of operation**.
- Mixer drawings including: unit dimension, nozzle drawings, mechanical seal arrangement drawing and unit weights.
- Motor dimension and wiring diagram.
- Data sheet for all the goods.
- Detailed description of the proposed equipment.
- Accessories drawings.
- ATEX/NEMA certificate & motor hazardous area certification.
- Test inspection
- Assembly, installation, operation and maintenance instructions.
- Fabrication schedule.
- Price listing of the offer.
- The price should include the packing and preparation for seaworthy transportation.

Attached drawings:
Tank layout and nozzles orientation.