HOJA DE DATOS PARA BOMBA DE TORNILLO DOBLE (EF)

REV.	FECHA	PÁG	DESCRIPCIÓN	ELAB	REV. / APROB.	APROB. ICHQ	APROB. PSSA
0	28/12/2012	4	EMISIÓN FINAL	GXD	ZYB/XGK		
A	24/05/2012	4	EMISIÓN PARA COMENTARIOS	GXD	ZYB/XGK		

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PDVSA
PETROLERA
SINOVENSA

DESARROLLO DE LA INGENIERÍA CONCEPTUAL Y B
ÁSICA DEL PROYECTO DE EXPANSIÓN DE
PRODUCCIÓN DE
105 MBD A 160 MBD

PDVSA
INGENIERÍA Y CONSTRUCCIÓN
HQCEC

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SCREW PUMP DATA SHEET

APPLICABLE TO: O PROPOSAL ● PURCHASE O AS BUILT — ITEM TAG: 0002-P-1002A/B/C/D/E
CLIENT: PSSA — PLANT: FS
SITE: MORICHAL — NO. OF PUMPS REQUIRED: FOUR (4) OPERATING AND ONE (1) SPARE
SERVICE: WDEHO TRANSFER PUMPS — SIZE AND TYPE: HORIZONTAL TWIN-SCREW PUMP
MANUFACTURER — SERIAL NO.

LEYEND: O INDICATES INFORMATION TO BE COMPLETED BY PURCHASER — ☐ BY MANUFACTURER

GENERAL

NO. MOTORS DRIVEN:		OTHER DRIVER TYPE			
PUMP ITEM NO'S:	0002-P-1002A/B/C/D/E	PUMP ITEM NO'S			
MOTOR ITEM NO'S:		DRIVER ITEM NO'S		GEAR ITEM NO'S	
MOTOR PROVIDED BY:		DRIVER PROVIDED BY		GEAR PROVIDED BY	
MOTOR MOUNTED BY:		DRIVER MOUNTED BY		GEAR MOUNTED BY	
MOTOR DATA SHEET NO.:		DRIVER DATA SHEET NO.		GEAR DATA SHEET NO.	

OPERATING CONDITIONS

- ● CAPACITY @ PT (GPM US):
  RANGE NORMAL 2145 RATED 2359.5
- ● DISCHARGE PRESSURE (psig):
  MAXIMUM: 383.7 MINIMUM: 281.0
- ● SUCTION PRESSURE (psig):
  MAXIMUM: 14.4 MINIMUM: 3.5
- ● DIFFERENTIAL PRESSURE (psi):
  MAXIMUM: 380.2 MINIMUM: 266.6
- ● NPSH AVAILABLE (ft.) 8.54 (NOTE2)
- ● SERVICE ● CONTINUOUS O INTERMITTENT

LIQUID

- ● TYPE OR NAME OF LIQUID: WET DILUENT EXTRA HEAVY OIL (NOTE3)
- ● PUMPING TEMPERATURE (°F):
  NORMAL: 100 MAX: 120 MIN: 90
- ● SPECIFIC GRAVITY: NORMAL 0.953 MAXIMUM 1 MINIMUM 0.94
- ● SPECIFIC HEAT Btu/lb °F
- ● VISCOSITY (cP): 442@ 100 °F MINIMUM 640.4@ 90 °F MAXIMUM
- ● VAPOR PRESSURE@ P.T. (psia) 14.7@ 100 °F
- O CORROSIVE/EROSIVE AGENTS:
- ● CHLORIDE CONCENTRATION (PTB) NaCl: 689 ~ 848 PTB
- O H_2S CONCENTRATION (PPM)
- LIQUID: O TOXIC ● FLAMMABLE O OTHER

PERFORMANCE

- ☐ RATED CAPACITY (GPM US)
- ☐ NPSH REQUIRED (ft.)
- ☐ RATED SPEED (RPM)
- ☐ DISPLACEMENT (GPM)
- ☐ VOLUMETRIC EFFICIENCY (%)
- ☐ MECHANICAL EFFICIENCY (%)
- ☐ BHP @ MAXIMUM VISCOSITY
- ☐ BHP @ RELIEF VALVE SETTING
- ☐ MAXIMUM ALLOWABLE SPEED (RPM)
- ☐ MINIMUM ALLOWABLE SPEED (RPM)

SITE AND UTILITY DATA (NOTE 1)

LOCATION: O INDOOR ● OUTDOOR O SUN
O HEATED ● UNHEATED O UNDER ROOF
● ELECTRICAL AREA CLASS 1 GROUP D DIV: 2
O WINTERIZATION REQD ● TROPICALIZATION REQD
SITE DATA :
O RANGE OF AMBIENT TEMPS:MIN/MAX : / °F
UNUSUAL CONDITIONS
O DUST O FUMES ● SALTY ATMOSPHERE
O OTHER
O UTILITY CONDITIONS

CONSTRUCTION

CONNECTIONS	SIZE	RATING	FACING	POSITION
SUCTION				
DISCHARGE				
GLAND FLUSH				
DRAINS				
VENTS				
JACKET				

PUMP TYPE:
☐ INTRN'L GEAR ■ TWIN-SCREW ☐ VANE
☐ EXTRN'L GEAR ☐ 3-SCREW ☐ PROGRESSING CAVITY

GEAR TYPE
☐ SPUR ■ HELICAL
☐ OTHER

	DRIVERS	HEATING	CONTROL	SHUTDOWN
ELECTRICITY				
VOLTAGE				
HERTZ				
PHASE				

COOLING WATER	INLET	RETURN	DESIGN	MAX Δ
TEMP °F	MAX			
PRESS. (psig)	MIN			
SOURCE				

INSTRUMENT AIR PRESSURE (psig) MAX MIN

APPLICABLE SPECIFICATIONS:

- ● API 676 POSITIVE DISPLACEMENT PUMPS - ROTARY (latest edition)
- ● PDVSA GA-202
- ● OTHERS SPECIFIED IN THE MATERIAL REQUISITION

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CONSTRUCTION (CONTINUED)

CASING (NOTE7)

- ☐ MAXIMUM ALLOWABLE PRESSURE: _____ kPa @ ____ °F
- ☐ HYDROSTATIC TEST PRESSURE: _____ kPa @
- ☐ STEAM JACKET PRESSURE: _____ kPa @ ____ °C

ROTOR MOUNT: ☐ BTWN. BEARINGS ☐ OVERHUNG

TIMING GEARS ☐ YES ☐ NO

BEARING TYPE: ☐ RADIAL _____ ☐ THRUST ____

LUBRICATION TYPE: ■ CONSTANT LEVEL OILERS

- ☐ PUMPED FLUID ☐ RING OIL ☐ OIL MIST
- ■ EXTERNAL ■ OIL FLOOD ☐ GREASE

- ☐ LUBRICANT TYPE:
- ● MECHANICAL SEALS: YES
- ☐ MANUFACTURER AND MODEL
- ☐ MANUFACTURER CODE
- ■ API 610 SEAL FLUSH PLAN 32+61 (NOTE5)
- ☐ API 610 SEAL CODE
- ○ PACKING: ☐ LANTERN RING
- ○ MFR. AND TYPE _____ ○ NO. OF RINGS ____

DRIVE MECHANISM

■ DIRECT-COUPLED ☐ V-BELT ☐ GEAR

☐ COUPLING MANUFACTURER

DRIVERS

MOTOR :

- ☐ MANUFACTURER
- ☐ TYPE
- ☐ FRAME NO.
- ☐ NEMA DESIGN
- ☐ APPROVAL, LISTED OR CERTIFIED BY:
- ○ CONSTANT SPEED
- ○ VARIABLE SPEED
- ☐ HP _____ RPM
- ● VOLTS 4160 PHASE 3
- ● HERTZ 60 SERVICE FACTOR
- ● ENCLOSURE TEFC
- ○ MINIMUM STARTING VOLTAGE
- ● STARTING METHOD Automatic
- ○ INSULATION _____ ○ TEMPERATURE CLASS
- ☐ CONSECUTIVE STARTS
- ☐ MOTOR WINDING MATERIAL

MAIN JUNCTION BOX:

- ○ CONDUIT INPUT _____ ☐ QUANTITY
- ☐ SIZE

SPACE HEATERS JUNCTION BOX:

- ○ CONDUIT INPUT _____ ☐ QUANTITY
- ☐ SIZE
- ○ STEAM TURBINE

REMARKS

OTHER PURCHASER REQUIREMENTS

NAMEPLATE UNITS ● ENGLISH ○ SI

● RELIEF VALVES BY PUMP MFRG ○ INTERNAL ● EXTRNL (NOTE4)

PIPING FOR SEAL FLUSH FURNISHED BY:

● PUMP VENDOR ○ OTHERS

PIPING FOR COOLING/HEATING FURNISHED BY:

○ PUMP VENDOR ○ OTHERS

○ PROVIDE TECHNICAL DATA MANUAL

MATERIALS (NOTE6)

- ☐ CASING CS
- ☐ STATOR
- ☐ COMMON BASE PLATES
- ☐ ROTOR (S) CS
- ☐ VANES
- ☐ SHAFT
- ☐ SLEEVE (S)
- ☐ GLAND (S)
- ☐ BEARING HOUSING
- ☐ TIMING GEARS
- ○ SPECIAL MATERIAL TESTS (2.9.1.3)
- ○ LOW AMBIENT TEMP. MATERIALS TESTS (2.9.5)

QA INSPECTION AND TEST

- ● COMPLIANCE WITH INSPECTORS & TEST PLAN
- ○ CERTIFICATION OF MATERIALS
- ○ FINAL ASSEMBLY CLEARANCES
- ○ SURFACE AND SUBSURFACE EXAMINATIONS
  - ○ RADIOGRAPHY
  - ○ ULTRASONIC
  - ○ MAGNETIC PARTICLE
  - ○ LIQUID PENETRANT
- ○ CLEANLINESS PRIOR TO FINAL ASSEMBLY
- ○ HARDNESS OF PARTS, WELDS & HEAT AFFECTED ZONES
- ○ FURNISH PROCEDURES FOR OPTIONAL TESTS

TESTS	REQ'D	WIT	OBS
HYDROSTATIC	○	○	○
MECHANICAL RUN	○	○	○
PERFORMANCE	○	○	○
NPSH	○	○	○

PREPARATION FOR SHIPMENT

○ DOMESTIC ● EXPORT

● OUTDOOR STORAGE MORE THAN 6 MONTHS

WEIGHTS (kg)

☐ PUMP _____ ☐ BASE _____ ☐ DRIVER _____

☐ COUPLING ☐ ACCESSORIES

BASEPLATE

● BY PUMP MANUFACTURER ○ SUITABLE FOR EPOXY GROUT

○ EXTENDED FOR

● COMMON PLATES BY PUMP MANUFACTURER

○ DRAIN ☐ DRAIN-RIM ■ DRAIN-PAN

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NOTES

1 See Document "PROCESS DESIGN BASIS FOR MORICHAL" for detail. Because no cooling water is applicable, vendor shall consider air cooling for pump bear housing and flushing plan etc., where cooling is necessary. Tropicalization is required.

2 For the value of NPSHa, the pumps shall be able to operate with 0.5%(mol) disolved gas.

3 WDEHO is a mixture of extra heavy oil, diluent(naphtha) and water 12%(V), it is flammable. The fluid containing sands.

4 External safety valves shall be supplied by vendor, the design pressure of downstream pipe is 429 Psig.

5 The mechanical seal flushing plan shall be confirmed by vendor.

6 The material shall be confirmed by vendor.

7 Pump casing drain shall be connected to the edge of baseplate with block valve.

8 The estimated hydraulic power is 516.4 HP.