Centrifugal pump process data sheet —

PAGE _____ OF _____

JOB NO. _____ ITEM NO.(S) _____

REQ./SPEC. NO. _____ / _____

PURCH. ORDER NO. _____ DATE _____

ENQUIRY NO. _____ BY _____

APPLICABLE TO: ○ PROPOSALS ○ PURCHASE ◙ AS BUILT

FOR _____ UNIT _____

SITE _____ SERVICE _____

NOTES: INFORMATION BELOW TO BE COMPLETED: ○ BY PURCHASER ☐ BY MANUFACTURER ◙ BY MANUFACTURER OR PURCHASER

○ DATASHEETS

	ITEM NO.	QT'Y	Attached	ITEM NO.	QT'Y	Attached	ITEM NO.	QT'Y	Attached
PUMP			○			○			○
MOTOR			○			○			○
GEAR			○			○			○
TURBINE			○			○			○

APPLICABLE OVERLAY STANDARD(S):

REVISIONS

NO.	DATE	BY
1		
2		
3		
4		
5		

○ OPERATING CONDITIONS (5.1.3)

FLOW, NORMAL _____ (m3/h) RATED _____ (m3/h)

OTHER _____

SUCTION PRESSURE MAX./RATED _____ / _____ (kPa)

DISCHARGE PRESSURE _____ (kPa)

DIFFERENTIAL PRESSURE _____ (kPa)

DIFF.HEAD _____ (m) NPSHA _____ (m)

PROCESS VARIATIONS (5.1.4) _____

STARTING CONDITIONS (5.1.4) _____

SERVICE: ○ CONT. ○ INTERMITTENT(STARTS/DAY) _____

○ PARALLEL OPERATION REQ'D (5.1.13)

○ SITE DATA (5.1.3)

LOCATION (5.1.30):

○ INDOOR ○ HEATED ○ OUTDOOR ○ UNHEATED

○ ELECTRICAL AREA CLASSIFICATION (5.1.24 / 6.1.4)

CL _____ GR _____ DIV _____

○ WINTERIZATION REQ'D. ○ TROPICALIZATION REQ'D.

SITE DATA (5.1.30):

○ ALTITUDE _____ (m) BAROMETER _____ (kPaA)

○ RANGE OF AMBIENT TEMPS: MIN. / MAX. _____ / _____ (℃)

○ RELATIVE HUMIDITY: MIN. / MAX. _____ / _____ (%)

UNUSUAL CONDITIONS: (5.1.30) ○ DUST ○ FUMES

○ OTHER _____

○ DRIVER TYPE

○ INDUCTION MOTOR ○ STEAM TURBINE ○ GEAR

○ OTHER _____

○ MOTOR DRIVER (6.1.1/6.1.4)

◙ MANUFACTURER _____

☐ _____ (kW) ☐ _____ (r / min)

☐ FRAME _____ ◙ ENCLOUSURE _____

◙ HORIZONTAL ◙ VERTICAL ◙ SERVICE FACTOR _____

◙ VOLTS / PHASE / HERTZ _____ / _____ / _____

○ TYPE _____

○ MINIMUM STARTING VOLTAGE (6.1.5) _____

◙ INSULATION _____ ○ TEMP. RISE _____

◙ FULL LOAD AMPS _____

◙ LOCKED ROTOR AMPS _____

◙ STARTING METHOD _____

◙ LUBE _____

BEARING (TYPE / NUMBER):

☐ RADIAL _____ /

☐ THRUST _____ /

☐ VERTICAL THRUST CAPACITY

UP _____ (N) DOWN _____ (N)

○ LIQUID (5.1.3)

LIQUID TYPE OR NAME _____

○ HAZARDOUS ○ FLAMMABLE ○ _____ (5.1.5)

		MIN.	NORMAL	MAX.
PUMPING TEMP.	(℃)			
VAPOUR PRESS.	(kPaA)			
RELATIVE DENSITY (SG):				
VISCOSITY	(cP)			

SPECIFIC HEAT, Cp _____ (kJ/kg·K)

○ CHLORIDE CONCENTRATION (6.5.2.4) _____ (ppm)

○ H2S CONCENTRATION _____ (ppm) WET (5.12.1.12.c)

CORROSIVE / EROSIVE AGENT _____ (5.12.1.9)

MATERIALS (5.12.1.1)

○ ANNEX H CLASS (5.12.1.1) _____

○ MIN DESIGN METAL TEMP (5.12.4.1) _____ (℃)

○ REDUCED HARDNESS MATERIAL REQ'D (5.12.1.12)

☐ BARREL/CASE _____ IMPELLER _____

☐ CASE/IMPELLER WEAR RINGS _____ /

☐ SHAFT _____

☐ DIFFUSERS _____

☐ PERFORMANCE:

PROPOSAL CURVE NO. _____ ☐ _____ r / min

☐ IMPELLER DIA. RATED _____ MAX. _____ MIN. _____ (mm)

☐ IMPELLER TYPE _____

☐ RATED POWER _____ (kW) EFFICIENCY _____ (%)

☐ MINIMUM CONTINUOUS FLOW:

THERMAL _____ (m3/h) STABLE _____ (m3/h)

☐ PREFERRED OPER. REGION _____ TO _____ (m3/h)

☐ ALLOWABLE OPER. REGION _____ TO _____ (m3/h)

☐ MAX. HEAD @ RATED IMPELLER _____ (m)

☐ MAX. POWER @ RATED IMPELLER _____ (kW)

☐ NPSHR AT RATED FLOW _____ (m) (5.1.10)

◙ MAX SUCTION SPECIFIC SPEED: (m3/h, m, rpm) (5.1.11)

◙ MAX. SOUND PRESS. LEVEL REQ'D _____ (dBA) (5.1.16)

◙ EST. MAX. SOUND PRESS. LEVEL _____ (dBA) (5.1.16)

◙ EST. MAX. SOUND POWER LEVEL (dBA) (5.1.16)

○ UTILITY CONSUMPTIONS (5.1.3)

ELECTRICITY	VOLTAGE	PHASE	HERTZ
DRIVERS			
HEATING			

SYSTEM VOLTAGE DIP ○ 80% ○ OTHER _____ (6.1.5)

STEAM	MAX.PRESS	MAX.TEMP.	MIN.PRESS	MIN. TEMP.
DRIVERS				
HEATING				

COOLING WATER: (5.1.19) SOURCE _____

SUPPLY TEMP. _____ (℃) MAX.RETURN TEMP. _____ (℃)

NORM. PRESS. _____ (kPa) DESIGN PRESS _____ (kPa)

MIN. RET. PRESS. _____ (kPa) MAX ALLOW.D.P. _____ (kPa)

CLORHIDE CONCENTRATION: _____ (ppm)

		REMARKS
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Centrifugal pump data sheet — Between bearings(type BB) —

PAGE _____ OF _____

JOB NO. _____ ITEM NO.(S) _____

REQ./SPEC. NO. _____ / _____

PURCH. ORDER NO. _____ DATE _____

ENQUIRY NO. _____ BY _____

CONSTRUCTION

ROTATION: (VIEWED FROM COUPLING END) ☐ CW ☐ CCW

PUMP TYPE: (4.1)

☒ BB1 ☒ BB2 ☒ BB3 ☒ BB5

CASING MOUNTING:

☐ CENTERLINE ☐ NEAR CENTERLINE

☐ FOOT

CASING SPLIT:

☒ AXIAL ☒ RADIAL

CASING TYPE:

☐ SINGLE VOLUTE ☐ MULTIPLE VOLUTE ☐ DIFFUSER

☐ BETWEEN BEARINGS ☒ BARREL

CASE PRESSURE RATING:

☐ MAX. ALLOWABLE WORKING PRESSURE _____ (kPa)

@ _____ (℃)

☐ HYDROTEST PRESSURE _____ (kPa)

○ SUCTION PRESS. REGIONS MUST BE DESIGNED FOR MAWP (5.3.6)

☐ **NOZZLE CONNECTIONS: (5.4.2)**

	SIZE (DN)	FLANGE RATING	FACING	POSITION
SUCTION				
DISCHARGE				
BALANCE DRUM				

PRESSURE CASING AUX. CONNECTIONS: (5.4.3)

	No.	SIZE (DN)	TYPE
☒ DRAIN			
☒ VENT			
☒ PRESS. GAUGE			
☒ TEMP. GAUGE			
☒ WARM-UP			
☒ BALANCE / LEAK-OFF			

☒ MACHINED AND STUDDED CONNECTIONS (5.4.3.8)

○ CYLINDRICAL THREADS REQUIRED (5.4.3.3)

ROTOR:

○ COMPONENT BALANCE TO ISO 1940 G1.0 (5.9.4.4)

○ SHRINK FIT - LIMITED MOVEMENT IMPELLERS (8.2.2.3)

COUPLINGS: (6.2.2)

○ MANUFACTURER _____ ☒ MODEL _____

☐ RATING (kW per 100 r / min) _____

☒ SPACER LENGTH _____ (mm) ☒ SERVICE FACTOR _____

DRIVER HALF COUPLING MOUNTED BY:

○ PUMP MFR. ○ DRIVER MFR. ○ PURCHASER

○ COUPLING WITH HYDRAULIC FIT (6.2.10)

○ COUPLING BALANCED TO ISO 1940 -1 G6.3 (6.2.3)

○ COUPLING PER ISO 14691 (6.2.4)

○ COUPLING PER ISO 10441 (6.2.4)

○ COUPLING PER API 671 (6.2.4)

○ NON-SPARK COUPLING GUARD (6.12.14c)

○ COUPLING GUARD STANDARD PER _____ (6.2.14.a)

BASEPLATES:

☐ API BASEPLATE NUMBER _____ (ANNEX D)

○ NON-GROUT CONSTRUCTION(6.3.13)

○ OTHER _____

MECHANICAL SEAL: (5.8.1)

○ SEE ATTACHED ISO 21049 / API 682 DATA SHEET

SURFACE PREPARATION AND PAINT

○ MANUFACTURER'S STANDARD ○ OTHER (SEE BELOW)

○ SPECIFICATION No. _____

PUMP:

○ PUMP SURFACE PREPARATION _____

○ PRIMER _____

○ FINISH COAT _____

BASEPLATE: (6.3.17)

○ BASEPLATE SURFACE PREPARATION _____

○ PRIMER _____

○ FINISH COAT _____

○ DETAILS OF LIFTING DEVICES (6.3.20) _____

SHIPMENT: (7.4.1)

○ DOMESTIC ○ EXPORT ○ EXPORT BOXING REQUIRED

○ OUTDOOR STORAGE MORE THAN 6 MONTHS

SPARE ROTOR ASSEMBLY PACKAGED FOR:

○ SHIPING CONTAINER (8.2.8.3) ○ VERTICAL STORAGE(8.2.8.2)

○ TYPE OF SHIPPING PREPARATION ○ N2 PURGE(8.2.8.4)

HEATING AND COOLING

○ HEATING JACKET REQ'D (5.8.9) ☒ COOLING REQ'D

☒ COOLING WATER (C.W.) PIPING PLAN (6.5.3.1) _____

C.W. PIPING:

☒ PIPE ☒ TUBING; FITTINGS _____

C.W. PIPING MATERIALS:

☒ S.STEEL ☒ C.STEEL ☒ GALVANIZED

COOLING WATER REQUIREMENTS:

☐ BEARING HOUSING _____ (m3/h) @ _____ (kPa)

☐ HEAT EXCHANGER _____ (m3/h) @ _____ (kPa)

STEAM PIPING: ○ TUBING ○ PIPE

BEARINGS AND LUBRICATION

BEARING (TYPE / NUMBER) (5.10.1):

☐ RADIAL _____ /

☐ THRUST _____ /

LUBRICATION (5.11.3, 5.11.4):

☒ RING OIL ☒ HYDRODINAMIC ☐ FLOOD ☐ FLINGER

○ PURGE OIL MIST ○ PURE OIL MIST

○ CONSTANT LEVEL OILER PREFERENCE (5.10.2.2): _____

○ PRESSURE LUBE SYS. ISO 10438-3 ○ ISO 10438-2 (8.2.6.1/8.2.6.5)

☒ OIL VISCOSITY ISO GRADE _____

○ OIL PRESS. TO BE GREATER THAN COOLANT PRESSURE

○ REVIEW AND APPROVE THRUST BEARING SIZE [8.2.5.2.4.d)]

☒ OIL HEATER REQUIRED: ○ STEAM ○ ELECTRIC

INSTRUMENTATION (6.4.2)

○ SEE ATTACHED API 670 DATASHEET

○ ACCELEROMETER(S) (6.4.2.1) _____

○ PROVISION FOR VIBRATION PROVES (6.4.2.2)

○ RADIAL _____ PER BRG. ○ AXIAL _____ PER BRG.

○ PROVISION FOR MOUNTING ONLY (5.10.2.11)

○ FLAT SURFACE REQ'D (5.10.2.12)

○ RADIAL BEARING METAL TEMP. ○ THRUST BEARING METAL TEMP.

○ TEMP. GAUGES (WITH THERMOWELLS) _____

○ MONITORS AND CABLES SUPPLIED BY (6.4.2.4.) _____

REMARKS _____

MASSES (kg)

PUMP _____ BASEPLATE _____

DRIVER _____ TOTAL _____

GEAR _____

SPARE PARTS (TABLE 18)

○ START UP ○ NORMAL MAINTENANCE

○ SPECIFY _____

OTHER PURCHASER REQUIREMENTS

○ COORDINATION MEETING REQUIRED (9.1.3)

○ MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)

○ MAX RELATIVE DENSITY

○ MAX. DIA. IMPELLERS AND/OR No.OF STAGES

○ OPERATATION TO TRIP SPEED

○ CONNECTION DESIGN APPROVAL (5.12.3.4/8.2.1.4)

○ INERT GAS INHIBITED STORAGE-SPARE CARTRIDGE(8.2.8.4)

○ TORSIONAL ANALYSIS REQUIRED (5.9.2.1)

○ TORSIONAL ANALYSIS REPORT (5.9.2.6)

○ PROGRESS REPORTS(9.3.3)

○ OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)

○ ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.2.1f)

☒ LATERAL ANALYSIS REQUIRED(8.2.4.1/8.2.4.1.3)

☒ DYNAMIC BLANCE ROTOR (8.2.4.2)

MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)

☒ VENT ☒ DRAIN ☒ COOLING WATER

☒ MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)

☒ FLANGES REQ'D IN PLACE OF SOCKET WELD UNIONS (6.5.2.8)

CONNECTION BOLTING

○ PTFE COATING ○ ASTM A153 GALVANIZED

○ PAINTED ○ SS

☒ INSTALLATION LIST IN PROPOSAL (9.2.3 L)

QA INSPECTION AND TESTING

○ SHOP INSPECTION (7.1.4)

○ PERFORMANCE CURVE APPR.

☒ TEST WITH SUBSTITUTE SEAL (7.3.3.2)

○ MATERIAL CERTIFICATION REQUIRED (5.12.1.8)

○ CASING ○ IMPELLER ○ SHAFT

○ OTHER _____

○ CASTING REPAIR PROCEDURE APPROVAL REQ'D (5.12.2.5)

☒ INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4 e)

☒ MAG PARTICLE ☒ LIQUID PENETRANT

☒ RADIOGRAPHIC ☒ ULTRASONIC

☒ INSPECTION REQUIRED FOR CASTINGS (7.2.1.3/5.12.1.5)

☒ MAG PARTICLE ☒ LIQUID PENETRANT

☒ RADIOGRAPHIC ☒ ULTRASONIC

○ HARDNESS TEST REQUIRED: _____ (7.2.2.3)

○ ADDITIONAL SURFACE / SUBSURFACE EXAMINATION FOR (7.2.1.3)

FOR _____

METHOD _____

QA INSPECTION AND TESTING (CONT.)

TEST	NON-WIT	WIT	OBSERVE
○ HYDROSTATIC (7.3.2)	○	○	○
○ PERFORMANCE (7.3.3)	○	○	○
○ NPSH (7.3.4.2)	○	○	○
○ RETEST ON SEAL L'KGE(7.3.3.2d)	○	○	○
○ RETEST REQUIRED AFTER FINAL HEAD ADJUSTMENT (7.3.3.5.b)	○	○	○
○ COMPLETE UNIT TEST (7.3.4.3)	○	○	○
○ SOUND LEVEL TEST (7.3.4.4)	○	○	○
○ CLEAN LINES PRIOR TO FINAL ASSEMBLY (7.2.2.2)	○	○	○
○ NOZZLE LOAD TEST (6.3.6)	○	○	○
○ CHECK FOR CO-PLANAR MOUNTING PAD SURFACES (6.3.3)	○	○	○
○ MECHANICAL RUN UNTIL OIL TEMP. STABLE (7.3.4.7.1)	○	○	○
○ 4 h MECHANICAL RUN AFTER OIL TEMP. STABLE (7.3.4.7.3)	○	○	○
○ 4 h MECH. RUN TEST(7.3.4.7.2)	○	○	○
○ TRUE PEAK VELOCITY DATA (7.3.3.4d)	○	○	○
○ BRG HSG RESONANCE TEST (7.3.4.6)	○	○	○
○ REMOVE/ INSPECT HYDRODYNAMIC BEARINGS AFTER TEST (8.2.7.5)	○	○	○
○ AUXILIARY EQUIPMENT TEST (7.3.4.5)	○	○	○
☒ CHARPY TEST (EN 13445/ASME VIII)	○	○	○
○ _____	○	○	○
○ _____	○	○	○
○ _____	○	○	○

○ VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1.c)

○ VENDOR SUBMIT TEST PROCEDURES (7.3.1.2 / 9.2.5)

○ VENDOR SUBMIT TEST DATA WITHIN 24h (7.3.3.3 e)

○ INCLUDE PLOTTED VIBRATION SPECTRA (5.9.3.3)

○ RECORD FINAL ASSEMBLY RUNNING CLEARANCES

○ COMPLETION OF INSPECTION CHECK LIST (7.1.6)

REMARKS

Centrifugal pump — References

PAGE _____ OF _____

JOB NO. _____ ITEM NO.(S) _____

REQ./SPEC. NO. _____ / _____

PURCH. ORDER NO. _____ DATE _____

ENQUIRY NO. _____ BY _____

☐ **PRESSURE DESIGN CODES**
○ **WELDING REQUIREMENTS**
◎ **PURCHASER-DEFINED MATERIAL INSPECTIONS**

APPLICABLE TO: ○ PROPOSALS ○ PURCHASE ◎ AS BUILT

FOR _____ UNIT _____

SITE _____ SERVICE _____

NOTES: INFORMATION BELOW TO BE COMPLETED: ○ BY PURCHASER ☐ BY MANUFACTURER ◎ BY MANUFACTURER OR PURCHASER

PRESSURE VESSEL DESIGN CODE REFERENCES.

☐ THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER

CASTING FACTORS USED IN DESIGN (5.3.4) (TABLE 3)	☐
SOURCE OF MATERIAL PROPERTIES	☐

WELDING AND REPAIRES (5.12.3)

THESE REFERENCES MUST BE LISTED BY THE PURCHASER (DEFAULT TO TABLE 10 IF NO PURCHASER REFERENCES IS STATED)

○ ALTERNATIVE WELDING CODES AND STANDARDS (5.12.3.1)

Welding Requirement (Applicable Code or Standard)	**Purchaser-defined**	**Default per Table 10**
Welder/Operator qualification	○	○
Welding procedure qualification	○	○
Non-pressure-retaining structural welding such as baseplates or supports	○	○
Magnetic particle or liquid penetrant examination of the plate edges	○	○
Postweld heat treatment	○	○
Postweld heat treatment of casing fabrication welds	○	○

MATERIAL INSPECTION (7.2.2.1) (7.2.1.3)

THESE REFERENCES MUST BE LISTED BY THE PURCHASER (DEFAULT TO TABLE 13 IF NO PURCHASER REFERENCES IS STATED)

○ ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 13)

Type of inspection	Methods	For fabrications	Castings
Radiography	○	○	○
Ultrasonic inspection	○	○	○
Magnetic particle inspection	○	○	○
Liquid penetrant inspection	○	○	○

REMARKS