PROJECT: PP- PE PILOT PLANT		client:	ayo.
TITLE: DATA SHEET FOR REFRIG	ERATED WATER PUMP(P-021)		شرکت ملی صنایع پتروش شرکت پژوهش و فناوری پتر
DA	Document No.:		Rev.: 0
	Owner Job No.:		Type:DAS
			Page A

PROJECT	: PP- P	E PILO	T PLAN	IT							client:						6	28.	2	
TITLE: DA	ATA SH	EET FO	OR REF	RIGER	ATED V	VATER	PUMP(P	-021)									بتروشیمی ی پتروشیمی	ملی صنایع <sub>ب</sub> هش و فناور:		
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Client:



### TITLE: DATA SHEET FOR REFRIGERATED WATER

PU	شرکت پژوهش و فناوری پتروشیمی (P-021)													
					ENTRIFUGA			SHEET	, SI UI	NIT				
l I	APPLICABLE	O: PROPO		O PURCHA	SE	AS BUI								Rev
l I	FOR	NDO DO	NPC		IDAN	***************************************	UNIT		DEF				(D. 004)	
1	SITE			E - ARAK -	IKAN		SREVICE		KEF	RIGERATEL	J WA	ATER PUMP(	(P-021)	
l i	No. of Req'd:	RMATION BELOW TO	: 1 / Star		O BY PURCH	JASED		DV MANILIEA	CTUDE	R D 1	DV M	ANILIEACTURE	D OD DI IDCUASED	
6	NOTES: INFO	RIMATION BELOW TO	BE COMPL			HASER	BY MANUFACTURER BY MANUFACTURER OR PURCHASER REVISIONS							
7		ITEM NO.	ATTACHE		DATA SHEETS REV  ITEM NO. ATTACHED ITEM NO. ATTACHED NO. DATE							BY		
l i	PUMP	P-021					_		-	0	1			***************************************
9	MOTOR	PM-021				C				0	2			
10	GEAR		0			C	)			0	3			*************
11	TURBINE									0	4			
12	APPLICABLE (	OVERLAY STANDARD	(-)	SO							5			*************
13		OPERATIN				( 3n )				LIQUID	_			
	FLOW, NORM	AL 15		and a	16.5	(m³/h)	_	YPE OR NAI				+ 20% GLY0		
	OTHER	SSURE MAX / RATED		ote 11) 0.81 /	2.5	(bara)	HAZA	ARDOUS		FLAMMABLE MIN.	:	TOXIC NORMAL	(5.1.5) MAX.	
	DISCHARGE F		- 10	4.6	2.5	(bara) (bara)	DUMDING	S TEMP (°C)		0	-	NORWAL 2	10	
		L PRESSURE		2.1				PRESS . (ba		0.006		0.007	0.012	***************************************
1 1	DIFF. HEAD		(m) NPSI	HA >	10 (Note 9)	(m)		E DENSITY (		1.04		1.05	1.05	
		RIATIONS (5.1.4)	. ,				VISCOSI			2.5		2.36	1.9	
		NDITIONS (5.1.4)	C	LOSED DEL	IVERY VALVE			CHEAT, C <sub>P</sub>			3	.82	(kj/kg .k.)	***************************************
22	SERVICE:	CONT O INT	TERMITTEN	NT (STARTS/	DAY)		CHLC	ORIDE CON	CENTRA	ATION (6.5.2.4	)	N/A	(mg/kg)	
H	O PARALLE	L OPERATION REQ'D					H₂S (	CONCENTR	ATION	N/A (mol	fraction	on)	WET (5.12.1.12c)	
24		SIT	TE DATA	(5.1.3)			CORROS	SIVE / EROS	VE AGE				(5.12.1.9)	
	LOCATION: (5	_					MATERIAL				***************************************			
26	INDOOR	•	~	DOOR 🛑 I	JNHEATED		Ŧ					S-5 (Note		
27 28	_	CAL AREA CLASSIFICA			2 (Note 2)		_				*********	(5.40.4.40)	(°C)	
28		I GR ZATION REQ D.					_			MATERIALS RE			c.s	
	SITE DATA (5.		FICALIZATIO	N KEQ D.		_		*****	RINGS		C.S		*************	
31	ALTITUD		OMETER	810	(mbar)	SHAF			ARABARARA	ISI 4			***************************************	
32	RANGE C	(°C)	DIFF											
33	Ξ	HUMIDITY:MIN / MAX			/ 44	(%)				PERFOR	RMA	NCE		***************************************
34	UNUSUAL CO	NDITIONS: (5.1.30)	(	DUST	FUMES		PROPOS	AL CURVE	NO.				(r/min)	
35	OTHER .		COR	ROSIVE	-		☐ IMPE	LLER DIA R	ATED	MAX	ζ.	MIN	(mm)	
36							_	LLER TYPE				CLOSE		
37	_			YPE			-		*******		EFFI	CIENCY	(%)	
38	_	~	) STEAM T		○ GEAR		_	MUM CONTI		_			/3,\	
39 40	OTHER		(N	ote 1)				ERRED OP	*****	(m³/h) STA	BLE	ТО	(m³/h) (m³/h)	
41		MOTOR	DRIVER (	6.1.1 / 6.1.4	)		_	WABLE OP		************		TO	(m³/h)	
42	MANUFA				<u> </u>			HEAD @ R					(m)	
43			<i>I</i> ) $\Box$		(	(r/min)	_	POWER @					(kw)	************
44	FRAME		ENCI	LOSURE			NPSH	HR AT RATE	D FLOV	/			(m) (5.1.10)	
45	HORIZON	ITAL VERTIC	AL	SERVICE	FACTOR	***************************************		SUCTION S		AL	13	3000 M3/Hr,N	<b>I,RPM</b> (5.1.11)	***************************************
46	VOLTS / F	PHASE / HERTZ	400	/ 3	/ 50					VEL REQ. D		85	(dba) (5.1.16)	
	TYPE			HRONOUS				MAX. SOUN		*********			(dba) (5.1.16)	
		STARTING VOLTAGE					EST	MAX. SOUN			NO.	E 4 0) (NOTE	(dba) (5.1.16)	
	INSULAT		TEMP. RI	ISE			EL FOTE:				N2 (	5.1.3) (NOTE	-	***************************************
	FULL LO	AD AMPS ROTOR AMPS	*******			***************************************	ELECTRI DRIV		V	400		PHASE 3	HERTZ 50	
	STARTIN			D.O.	L		HEAT			700		J	50	
	LUBE	E1110D		5.0.		***************************************		TEM VOLTAG	GE DIP	O80%	,	OTHER	(6.1.5)	***************************************
		/PE / NUMBER) :					STEAM	MAX. F		MAX. TEM		MIN. PRES	1	
55	RADIAL	,	/			***************************************	DRIVERS							***************************************
56	THRUST		1				HEATING	;						
57	_	L THRUST CAPACITY						3 WATER:	(5.1.19)	_				***************************************
58	UP	(N)	DOWN			(N)	SUPPLY					TURN TEMP.	(°C)	
59							NORM. P	ALALALALALA	*******			PRESS.	(bar)	***************************************
60 61								. PRESS. DE CONCEN	TDATIO		x. ALI	LOW. D.P.	(bar)	
62							CHLORIL	DE CONCEN	IRAIIO	IN :			(mg/kg)	
02				Documen	nt No.:								Rev.: 0	
				Owner Jo	b No.:								Type:DAS	
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# Client:

	E: DATA SH	EET FOR	REFRIGE	RATED WA	TER		شر کت ملی صنایع پتروشیمی							
JUIVI	IP(P-021)						ن و فناوری پتروشیمی	شركت پژوهش						
				CEN	ITDIELICAI	DLIM	D DATA CHEET CLIINIT							
1			CONSTRU		ITRIFUGAL	L P U IVI	P DATA SHEET, SI UNIT  SURFACE PREPARATION AND PAINT	Rev						
2	ROTATION : (VIE	WED FROM			cw 🔲	CCW								
3	PUMP TYPE : (4.		_	_			SPECIFICATION NO. 900-SPC-A4-PD-0002							
4	CASING MOUNTI		OH6	OTHER		~~~~~~~~	PUMP:  PRIMER	annominanenenenenenenenenenenenenen en en en en						
6	CASING MOUNT		LINE	OTHER			FINISH COAT							
7							BASEPLATE: (6.3.1.7)							
8	CASING TYPE :			_	_		PRIMER							
9	SINGLE VOL	_	ILTIPLE VOLUT	E _	DIFFUSER		FINISH COAT							
11	OH6 PUMP S		GION DESIGNE	ED FOR MAWP (5	5.3.6)		DETAILS OF LIFTING DEVICES (6.3.20)  SHIPMENT: (7.4.1)							
12	l —					(bar)	● DOMESTIC ● EXPORT ● EXPORT BOXING REQUIF	RED						
13		100	(°C)				OUTDOOR STORAGE MORE THAN 6 MONTHS							
14	I=			1.5 x MA\	WP	(bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR:							
15 16	NOZZLE CO	SIZE	FLANGE	(Note 7)	POSITION	$\neg$	HORIZONTAL STORAGE VERTICAL STORAGE  TYPE OF SHIPPING PREPARATION	***************************************						
17		SIZE	RATING	1 400	1 00111014		HEATING AND COOLING							
18	SUCTION	2"	150#	RF			HEATING JACKET REQ D. (5.8.9)							
	DISCHARGE	1 1/2"	150#	RF			COOLING REQ D.	annonement of the second						
20	PDEOGLIDE	0401110 4111	/ OONINEOTION	10 . (5 4 0)			COOLING WATER PIPING PLAN (6.5.3.1)	namenanamenanamenanamenanananananananana						
21 22	PRESSURE	CASING AUX	NO.	SIZE (DN)	TYPE		C.W. PIPING:    PIPE   TUBING: FITTINGS							
23	DRAIN			1/2"	VALVED		C.W. PIPING MATERIALS:							
24	VENT			1/2"	VALVED		S.STEEL C.STEEL GALVANIZED							
25	WARM-UP						COOLING WATER REQUIREMENTS:	(311.)						
26 27	MACHINED A	AND STUDDE	D CONNECTIO	NS · (5 4 3 8)			BEARING HOUSING HEAT EXCHANGER	(m³/h) (m³/h)						
28							TOTAL COOLING WATER	(m <sup>3</sup> /h)						
29	ROTOR:						HEAT MEDIUM: O STEAM O OTHER							
30	COMPONEN		TO ISO 1940 G	1.0 (5.9.4.4)			HEATING PIPING : O TUBING O PIPE							
31 32	COUPLINGS :(6.2 MANUFACTU		VTA	MODEL SE	PACER (Type	TSK)	BEARING AND LUBRICATION BEARING (TYPE / NUMBER ) (5.10.1) :							
	1			WODEL OF	AOLIT (Type	, 1010	RADIAL /	A section and a section of the secti						
34	_		TA (mm)	SERVIC	E FACT.		THRUST /							
35	COUPLING E						LUBRICATION (5.11.3,5.11.4):	***************************************						
36	<u> </u>			PING DEVICE (6.2	2.1.1)		GREASE OIL  PURGE OIL MIST  PURGE OIL MIST	y annual						
37 38	COUPLING F						PURGE OIL MIST OPURE OIL MIST  CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):	COMPANION CONTRACTOR C						
39	COUPLING F			ASME B	3151		OIL VISC. ISO GRADE							
40	NON SPARK	COUPLING	GUARD (6.2.14	C)			INSTRUMENTATION							
	COUPLING (	GUARD STAN	IDARD PER			(6.2.14a)	ACCELEROMETER (6.4.2.1)	100 and all all all all all all all all all al						
42	BASEPLATES:				(ANNEX D	0)	PROVISION FOR MOUNTING ONLY (5.10.2.11)  FLAT SURFACE REQ D (5.10.2.12)							
	NON-GROUT	T CONSTRUC	CTION (6.3.13)			,	TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)							
	OTHER						O PRESSURE GAUGE TYPE							
	MECHANICAL SE		(Note 4	& 5)										
48	CATEGORY						REMARKS:							
49	1=													
50	PLAN			01			MASSES							
51							MASS OF PUMP (kg)							
52 53							MASS OF BASEPLATE (kg)  MASS OF DRIVER (kg)							
54							TOTAL MASS (kg)							
55														
56														
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PROJECT: PP- PE PILOT PLANT

PROJECT: PP- PE PILOT PLANT
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## TITLE: DATA SHEET FOR REFRIGERATED WATER PUMP(P-021)

	CENTRIFUGA					
	TS (TABLE 18)		QA INSPECTION AN		•	
START-UP NORMAL M			TEST	NON-WIT	WIT	OBSERVE
OTHERS 2 YEARS OF OPERA			HYDROSTATIC (7.3.2)	$\circ$		0
•	ER REQUIREMENTS		PERFORMANCE (7.3.3)	Ó		$\circ$
COORDINATION MEETING REQUIRE	, ,		O RETEST ON SEAL	0	$\circ$	$\circ$
MAXIMUM DISCHARGE PRESSURE T	O INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)	_	_	_
MAX RELATIVE DENSITY			NPSH (7.3.4.2)	Ō	•	Q
O MAX DIA. IMPELLERS AND / OR N	IO OF STAGES		TRUE PEAK VELOCITY	0	$\circ$	$\circ$
OPERATION TO TRIP SPEED			DATA (7.3.3.4D)			
OH3 BEARING HS6 LIFTER (8.1.2.6)			COMPLETE UNIT TEST (7.3.4.3)	0	$\circ$	$\circ$
CONNECTION DESIGN APPROVAL (5	5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	0		$\circ$
TORSIONAL ANALYSIS REQUIRED (	5.9.2.1)		CLEANLINESS PRIOR TO		$\circ$	0
TORSIONAL ANALYSIS REPORT (5.9	0.2.6)		FINAL ASSEMBLY (7.2.2.2)			
PROGRESS REPORTS (9.3.3)			NOZZLE LOAD TEST (6.3.6)	0	0	0
OUTLINE OF PROCEDURES FOR OF	TIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	Õ	Õ	Õ
ADDITIONAL DATA REQUIRING 20 YE			MOUNTING PAD SURFACE (6.3.3)	•	•	0
	PPURTENANCES		O MECHANICAL RUN UNIT OIL	0	$\circ$	0
ANIFOLD PIPING TO SINGLE CONNECT			TEMP P. STABLE (7.3.4.7.1)	$\circ$	$\overline{}$	$\sim$
	<b>-</b> ` ′		1 _	$\circ$	$\bigcirc$	$\circ$
	COOLING WATER		4 HR. MECHANICAL RUN AFTER	O	$\circ$	0
MOUNT SEAL RESERVOIR OFF BAS	· ·		OIL TEMP STABLE (7.3.4.7.3)	_		
FLANGES REQ D IN PLACE OF SOCI	, ,		4 HR. MECH. RUN TEST (7.3.4.7.2)	Ö		O
INSTALLATION LIST IN PROPOSAL (9	.2.3L)		O BRG HSG RESONANCE	0	$\circ$	$\circ$
ONNECTION BOLTING			TEST (7.3.4.6)	_	_	_
OPTFE COATING OASTM	A153 GALVANIZED		O AUXILIARY EQUIPMENT	0	$\circ$	$\circ$
O PAINTED SS			TEST (7.3.4.5)			
QA INSPECTION	ON AND TESTING		IMPACT TESTING (5.12.4.3)	0	0	0
SHOP INSPECTION (7.1.4)	(Note 6)		O PER EN 13445		_	_
) PERFORMANCE CURVE APPROVAL			O PER ASME V III			
TEST WITH SUBSTITUTE SEAL (7.3.3	.2B)			0	$\bigcirc$	0
MATERIAL CERTIFICATION REQUIRE			O VENDOR KEEP REPAIR AND HT RE	•	_	$\circ$
CASING IMPELLER	SHAFT		VENDOR SUBMIT TEST PROCEDUI			
OTHER SHAFT SLEEVES, INTER	_	CEAL DADTO				
<del>-</del>		. SEAL PARTS	~		5 (7.3.3.3⊑)	
CASTING REPAIR PROCEDURE APP			INCLUDE PLOTTED VIBRATION SPI			
INSPECTION REQUIRED FOR CONN	, ,		SUBMIT INSPECTION CHECK LIST	(7.1.6)		
	QUID PENETRANT					
	TRA SONIC					
INSPECTION REQUIRED FOR CASIN	,					
MAG PARTICLE LIG	QUID PENETRANT					
	TRA SONIC					
HARDNESS TEST REQUIRED :		(7.2.2.3)				
ADDITIONAL SUBSURFACE EXAMINA	TION FOR 7.21.3					
FOR						
METHOD						
		REMARKS				
				***************************************		******************************
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PROJECT: PP- PE PILOT PLANT		client:	<b>*</b>
TITLE: DATA SHEET FOR REFRIGERA	ATED WATER PUMP(P-021)	يمى وشيمى	شرکت ملی صنایع پتروش شرکت پژوهش و فناوری پتر
Note 1: ALL ELECTRICAL MOTORS SHAL	L BE IN ACCORDANCE WITH "TECHNICAL SPECIFIC	CATION FOR LV MOTOR" DOC.No.	
900-SPC-A4-EE-0005 MOTOR E	NCLOSURES SHALL BE OF TOTALLY ENCLOSED FAI	N-COOLED (TEFC)	
Note 2: TYPE OF PROTECTION SHALL BE	Aexd		
Note 3: DRY, FLEXIBLE , MULTI DISK ,S.S	MEMBRANE SPACER TYPE COUPLING SHALL BE	JSED.	
DRIVER HALF COUPLING SHALL	BE MOUNTED BY PUMP MFR.		
Note 4: MECHANICAL SEAL SHALL BE AS	S PER API 682 / ISO 21049 3rd EDITION :2004. VE	NDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEE	Г
FOR MECHANICAL SEALS.			
Note 5: VENDOR IS REQUIRED TO REVIE	EW AND CONFIRM.		
Note 6: REFERE TO "INSPECTION & TEST	F PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC	C.No.: 900-ITP-A4-RE-0001.	
Note 7: ALLOWABLE LOAD AND MOME	NTS ON NOZZLES AND FLANGES SHALL BE AS PER	ISO STANDARD.	
Note 8: SPECIAL TOOLS SHALL BE SUPPL	LIED BY VENDOR IF REQUIRED FOR PRE-COMMISI	ONNING,COMMISIONING,START-UP AND	
MAINTANANCE PERIOD.			
Note 9: NPSH REQUIRED FOR SELECTED	PUMP SHALL BE AT LEAST 1 METER LESS THAN N	IPSHA.	
Note 10: DESIGN TEMPRATURE RANGE IS	S: -30 /100 °C.		
Note 11: ESTIMATED SHUT-OFF PRESSUR	E IS 5.52 BARA.		
Note 12: Ex-group: ExdIIBT4			
Note 13:REFERE TO "UTILITY CONDITION	N" DOC.No.: 900-SPC-A4-PR-0006.		
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	Document No.:		Rev.: 0
	Owner Job No.:		Type:DAS

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PROJECT: PP- PE PILOT PLANT		client:	
TITLE: DATA SHEET FOR RCW PUMP	(P-031)		شر <i>ک</i> ت ملی صنایع پتروشیم شر کت پژوهش و فناوری پتروش
	Cument No.:	CW PUMP (P-031)	Rev.: 0
<u> </u>	ner Job No.:		Type:DAS
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PROJECT	ROJECT: PP- PE PILOT PLANT										client:						6	SXC	2		
TITLE: DA	ATA SH	EET FO	OR RCV	V PUMF	P (P-031	)											بتروشیمی ی پتروشیمی	ملی صنایع پ وهش و فناور:	شرکت شرکت پژو		
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									ی پتروشیمی	شرکت پژوهش و فناور			
_	4 DDI 10 4 DI E :		0.41	CENTRIFUG			SHEET, SI U	JNIT			In		
1	APPLICABLE TOR	TO: PROPOS	SAL () NPC R&	PURCHASE T	AS BU	ILT UNIT		QED\/II	CES (000)		Rev		
3	SITE	NPC R&		ARAK - IRAN	***************************************	SREVICE			I PUMP (P-031)				
4	No. of Req'd:		1 / Stand b										
5	NOTES : INFO	RMATION BELOW TO I	BE COMPLET	ED O BY PURC	CHASER	ВУ	MANUFACTURE	R D E	BY MANUFACTUR	ER OR PURCHASER			
6				DATA SHEETS	3		RE	VISIONS					
7		ITEM NO.	ATTACHED	ITEM NO.		ACHED	ITEM NO.	ATTACHED	NO. DATE	BY	****************		
8	PUMP	P-031						$\frac{1}{2}$	1		_		
9	MOTOR GEAR	PM-031				_			3				
	TURBINE		Ö		-	5		$\frac{1}{0}$	4		**************		
12		OVERLAY STANDARD(	S): ISO	STANDARD					5		<u> </u>		
13		OPERATIN	G CONDITION	ONS (5.1.3)				LIQUID	(5.1.3)	,	**************		
14	FLOW, NORM	AL 80	(m³/h) RAT	ED 88	(m³/h)	LIQUID TYP	E OR NAME	WA	TER + 20% GLY	COLE	************		
	OTHER		(Note		***************************************	HAZAR	DOUS (	FLAMMABLE	TOXIC	(5.1.5)			
		SSURE MAX / RATED	10.8		(bara)		.0	MIN.	NORMA		_		
	DISCHARGE I	***********	*******************	4	(bara)	PUMPING T		25	35	45			
		L PRESSURE 15.4	(m) NDCHA	1.5 >10 (Note 9)	(bar)		RESS . (bara) DENSITY (SG):	0.006 1.04	0.007 1.05	0.012 1.05	-		
	DIFF. HEAD	15.4 RIATIONS (5.1.4)	(III) INPSHA	> 10 (Note 3)	(m)	VISCOSITY	, ,	2.5	2.36	1.05	***************************************		
		ONDITIONS (5.1.4)	CLO	SED DELIVERY VALV	/E	SPECIFIC F		2.0	3.82	(kj/kg .k.)			
		CONT INT					RIDE CONCENTE	RATION (6.5.2.4)					
23	_	EL OPERATION REQ'D (		<u> </u>		H₂S CO	NCENTRATION	N/A (molf	fraction)				
24		SIT	E DATA (5.1	1.3)		CORROSIV	E / EROSIVE AG	ENT N/A		(5.12.1.9)	*****************		
	LOCATION: (5	,		_				MATERIAL	. ,				
26	_	HEATED	$\overline{}$	•					S-5 (Note	9 5)			
27	_	CAL AREA CLASSIFICA					SIGN METAL TE			(°C)	***********		
28 29	CL	l GR ZATION REQ D.	C,T4 DIV	2 (Note 2) ALIZATION REQ D.		© REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)  BARREL / CASE C.S IMPELLER C.S							
	SITE DATA (5.		O IROPIC	ALIZATION REQ D.		_	IMPELLER WEA		C.S				
31		E <b>1889</b> (m)	BAROM	ETER <b>810</b>	(mbar)	SHAFT		***********	ISI 4140		*************		
32	_	OF AMBIENT TEMPS:MII		-28 / 44		DIFFUS							
33	RELATIV	E HUMIDITY:MIN / MAX		/ 86	(%)			PERFOR	MANCE				
34	UNUSUAL CO	NDITIONS: (5.1.30)	•	DUST FUMES		PROPOSAL	CURVE NO.	****		(r/min)			
35	OTHER		CORRO	SIVE		IMPELL	ER DIA RATED	MAX	MIN	l(mm)	*************		
36			DIVED TVD			IMPELL			CLOSE				
37	A INDUST		RIVER TYP			1 =			EFFICIENCY	(%)	***************		
38 39	OTHER	ON MOTOR (	STEAM TUR	0		_	JM CONTINUOU IAL	_	BI E	(m³/h)			
40	Onnek		(14010	, 1)	***************************************		RRED OPER. RE	and the same of th	TO	(m³/h)	*************		
41		MOTOR I	DRIVER (6.1	.1 / 6.1.4)		<del>-</del> -	ABLE OPER. RE	***********	то	(m³/h)			
42	MANUFA	CTURER				☐ MAX. H	EAD @ RATED I	MPELLER		(m)			
43			) [		(r/min)		OWER @ RATE			(kw)			
44	FRAME		ENCLOS				AT RATED FLO			(m) (5.1.10)			
45	HORIZON			SERVICE FACTOR	***************************************	MAX SUCTION SPECIFIC SPEED: 13000 M3/Hr,M,RPM (5.1.11)							
	=	PHASE / HERTZ	400 /		50		SOUND PRESS L		85	(dba) (5.1.16)			
	TYPE MINIMUM	I STARTING VOLTAGE	ASYNCHR	UNUUS			AX. SOUND PRE AX. SOUND POW	***********		(dba) (5.1.16)			
	INSULAT		(6.1.5) TEMP. RISE			EST IVIE			NS (5.1.3) (NOTE	(dba) (5.1.16)			
	FULL LO		, INIOE			ELECTRICI		/OLTAGE	PHASE	HERTZ	************		
51	LOCKED	ROTOR AMPS				DRIVER		400	3	50	****************		
52	STARTIN	G METHOD		D.O.L		HEATIN	IG						
53	LUBE					SYSTE	M VOLTAGE DIP	○80%	OTHER	(6.1.5)			
		YPE / NUMBER) :	and the second			STEAM	MAX. PRESS.	MAX. TEM	P MIN. PRES	SS. MIN. TEMP			
55	RADIAL					DRIVERS					***************************************		
56	THRUST		/			HEATING	MATED: (5.4.10	0011005			-		
57 58	UP VERTICA	L THRUST CAPACITY (N)	DOWN		(N)	SUPPLY TE	VATER: (5.1.19 MP		. RETURN TEMP.	(°C)			
59	J1	(14)	20111		(17)	NORM. PRE			SIGN PRESS.	(bar)			
60						MIN. RET. F	******************	anana .	K. ALLOW. D.P.	(bar)	****************		
61							CONCENTRATI	and the same of th		(mg/kg)			
62			<del></del>										
			Do	cument No.:						Rev.: 0			
			Ov	vner Job No.:						Type:DAS			
										Page 1 of 4			

PROJECT: PP- PE PILOT PLANT	Client:	
TITLE: DATA SHEET FOR RCW PUMP (P-031)		شر کت ملی صنایع پتروشیمی شر کت پژوهش و فناوری پتروشیمی

ITI E. DATA CHEET FOR DOWN	IMD (D 024)		<b>◎</b> 36 €	
TLE: DATA SHEET FOR RCW PU	IMP (P-031)		شر کت ملی صنایع پتروشیمی ِکت پژوهش و فناوری پتروشیمی	شر
	CENTRIFICAL	DUM	D DATA QUEET QUINIT	
CONSTR		_ PUM	P DATA SHEET, SI UNIT SURFACE PREPARATION AND PAINT	Rev
2 ROTATION : (VIEWED FROM COUPLING EN		CCW	MANUFACTURER'S STANDARD OTHER SEE BELOW	Ket
3 PUMP TYPE : (4.1) ISO			SPECIFICATION NO. 900-SPC-A4-PD-0002	
4 OH1 OH3 OH6	OTHER		PUMP:  PRIMER	annonement of the second
5 CASING MOUNTING : 6 CENTERLINE IN-LINE	OTHER		FINISH COAT	
7	<u> </u>		BASEPLATE: (6.3.1.7)	
8 CASING TYPE :			PRIMER	
9 SINGLE VOLUTE MULTIPLE VOLUTION CASE PRESSURE RATING:	TE DIFFUSER		FINISH COAT  DETAILS OF LIFTING DEVICES (6.3.20)	
11 O OH6 PUMP SUCTION REGION DESIGN	IED FOR MAWP (5.3.6)		DETAILS OF LIFTING DEVICES (6.3.20) SHIPMENT: (7.4.1)	
12 MAX. ALLOWABLE WORKING PRESSU		(bar)	● DOMESTIC ■ EXPORT ■ EXPORT BOXING REQUIRED	
13 @ 100 (°C)	4 8		OUTDOOR STORAGE MORE THAN 6 MONTHS	
14 HYDRO TEST PRESSURE 15 NOZZLE CONNECTIONS : (5.4.2)	1.5 x MAWP (Note 7)	(bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR:  HORIZONTAL STORAGE  VERTICAL STORAGE	-
16 SIZE FLANGE		$\neg$	O TYPE OF SHIPPING PREPARATION	
17 RATING	i	_	HEATING AND COOLING	
18 SUCTION 6" 150#	RF	_	HEATING JACKET REQ D. (5.8.9)	
19 DISCHARGE 4" 150#	RF		COOLING REQ D. COOLING WATER PIPING PLAN (6.5.3.1)	de la company de
21 PRESSURE CASING AUX. CONNECTION	DNS : (5.4.3)		C.W. PIPING:	enconcon
22 NO.	SIZE (DN) TYPE		PIPE TUBING: FITTINGS	
23 DRAIN	1/2" VALVED	_	C.W. PIPING MATERIALS:	
24 VENT 25 WARM-UP	1/2" VALVED	$\dashv$	S.STEEL C.STEEL GALVANIZED	
26	1		BEARING HOUSING (m³/h)	
27 MACHINED AND STUDDED CONNECTION	ONS: (5.4.3.8)		HEAT EXCHANGER (m³/h)	
28 CYLINDRICAL THREADS REQUIRED (5	.4.3.3)		TOTAL COOLING WATER (m³/h)	enonenenenen
29 ROTOR: 30 COMPONENT BALANCE TO ISO 1940 (	2 1 0 (5 9 4 4)		HEAT MEDIUM: O STEAM O OTHER HEATING PIPING: O TUBING PIPE	
31 COUPLINGS :(6.2.2)	J 1.0 (0.0. <del>1.1</del> )		BEARING AND LUBRICATION	
32 MANUFACTURER VTA	MODEL SPACER (Type	TSK)	BEARING (TYPE / NUMBER ) (5.10.1) :	
RATING (kw per100 r/min)	O SEDVICE FACT		RADIAL /	
34 SPACER LENGTH VTA (mm) 35 COUPLING BALANCED TO ISO 1940-1	SERVICE FACT.  G 6.3 (6.2.3)		THRUST / LUBRICATION (5.11.3,5.11.4) :	
36 O COUPLING WITH PROPRIETARY CLAW			GREASE OIL	
37 COUPLING PER ISO 14691 (6.2.4)			PURGE OIL MIST OPURE OIL MIST	
38 COUPLING PER ISO 10441 (6.2.4)	O AOME DATE		CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):	_
39 COUPLING PER ISO STANDARD 40 NON SPARK COUPLING GUARD (6.2.1)	ASME B151 4C)		OIL VISC. ISO GRADE  INSTRUMENTATION	
41 COUPLING GUARD STANDARD PER	,	(6.2.14a)	ACCELEROMETER (6.4.2.1)	
42 BASEPLATES:	0.00.00.00.00.00.00.00.00.00.00.00.00.0		PROVISION FOR MOUNTING ONLY (5.10.2.11)	
43 API BASEPLATE NUMBER 44 NON-GROUT CONSTRUCTION (6.3.13)	(ANNEX D	0)	FLAT SURFACE REQ D (5.10.2.12)	
45 OTHER			TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)  PRESSURE GAUGE TYPE	
46 MECHANICAL SEAL : (5.8.1) (Note 4	l & 5)			
47 CATEGORY				
48 ARRENGMENT 49 TYPE			REMARKS :	
49 1 1YPE 50 PLAN	01		MASSES	
51			MASS OF PUMP (kg)	
52			MASS OF BASEPLATE (kg)	
53 54			MASS OF DRIVER (kg)  TOTAL MASS (kg)	anana a
55			TOTAL WAGO (kg)	
56				
	Document No.:		Rev.: 0	
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( FRI FI	FIIGAI PIIMP	DATA SHEET, SI UNIT				
CDADE DADTO /TADLE 40\	OGAL PUNIP	QA INSPECTION A	ND TESTIN	C (CONT	1	
2 START-UP NORMAL MAINTENANCE		TEST	NON-WIT	WIT	OBSERVE	+
3 OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	0	<u></u>	O	-
OTHER PURCHASER REQUIREMENTS	3	PERFORMANCE (7.3.3)	Ö		Õ	
5 COORDINATION MEETING REQUIRED (9.1.3)	-	O RETEST ON SEAL	$\tilde{\circ}$	Ŏ	Õ	
6 MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)	0		0	-
7 OMAX RELATIVE DENSITY		NPSH (7.3.4.2)	0		0	-
8 MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCITY	$\tilde{\circ}$		$\tilde{c}$	-
9 OPERATION TO TRIP SPEED		DATA (7.3.3.4D)		0	0	
10 OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.3)	0	0	0	-
11 CONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	ŏ			-
12 TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		$\overline{}$	0	-
TORSIONAL ANALYSIS REPORT (5.9.2.6)		FINAL ASSEMBLY (7.2.2.2)		$\circ$	0	-
PROGRESS REPORTS (9.3.3)		NOZZLE LOAD TEST (6.3.6)	0	$\bigcirc$	0	-
15 OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	Ö	$\sim$	$\sim$	-
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.	1f)	MOUNTING PAD SURFACE (6.3.3)	0	$\circ$	$\circ$	no.
DIDING AND ADDUCTENANCES	. 11)	<b>-</b>	0	0	$\circ$	-
		MECHANICAL RUN UNIT OIL	0	$\circ$	$\circ$	-
18 MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)  19 PAIN TO COOLING WATER		TEMP P. STABLE (7.3.4.7.1)	$\circ$	$\bigcirc$	$\bigcirc$	-
		4 HR. MECHANICAL RUN AFTER	O	0	0	+
MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)	2.0)	OIL TEMP STABLE (7.3.4.7.3)	$\circ$		$\overline{}$	- }
21 FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5) 22 NI INSTALLATION LIST IN PROPOSAL (9.2.3L)	.2.0)	4 HR. MECH. RUN TEST (7.3.4.7.2) BRG HSG RESONANCE	0		0	- }
1 <del></del>		_	0	$\circ$	$\circ$	
CONNECTION BOLTING		TEST (7.3.4.6)	$\circ$	$\bigcirc$	$\circ$	
24 OPTFE COATING ASTM A153 GALVANIZED 25 OPAINTED SS		O AUXILIARY EQUIPMENT	0	0	$\circ$	-
OA INCOPPORTION AND TRATING		TEST (7.3.4.5)	$\circ$	$\circ$		-
QA INSPECTION AND TESTING 27 SHOP INSPECTION (7.1.4) (Note 6)		MPACT TESTING (5.12.4.3)   PER EN 13445	0	$\circ$	0	-
		PER ASME V III				~
<u>~</u>			$\circ$			-
TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		0	0	0	0	-
MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT RI				-
CASING IMPELLER SHAFT		VENDOR SUBMIT TEST PROCEDU				-
OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS,				S (7.3.3.3E	)	-
33 CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)		INCLUDE PLOTTED VIBRATION SP				-
INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.	4e)	SUBMIT INSPECTION CHECK LIST	(7.1.6)			-
MAG PARTICLE LIQUID PENETRANT  BIOMAGORAPHIC ULTRA SONIC						
						-
						-
						-
89 ☐ RADIOGRAPHIC ■ ULTRA SONIC 10 ☐ HARDNESS TEST REQUIRED :	(7.2.2.3)					·
	(1.2.2.3)					·
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4						-
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PROJECT: PP- PE PILOT PLANT		client:	<b>*</b>
TITLE: DATA SHEET FOR RCW PUMP	P (P-031)	يمى وشيمى	شرکت ملی سنایع پتروش شرکت پژوهش و فناوری پتر
Note 1: ALL ELECTRICAL MOTORS SHAL	L BE IN ACCORDANCE WITH "TECHNICAL SPECIFIC	CATION FOR LV MOTOR" DOC.No.	
900-SPC-A4-EE-0005 MOTOR EI	NCLOSURES SHALL BE OF TOTALLY ENCLOSED FAI	N-COOLED (TEFC)	
Note 2: TYPE OF PROTECTION SHALL BE			
	5 MEMBRANE SPACER TYPE COUPLING SHALL BE	USED.	
DRIVER HALF COUPLING SHALL			_
	S PER API 682 / ISO 21049 3rd EDITION :2004. VE	NDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEE	Т
FOR MECHANICAL SEALS.	EW AND CONFIDM		
Note 5: VENDOR IS REQUIRED TO REVIE	EW AND CONFIRM. T PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC	No · 900-ITP-A/L-PF-0001	
	ENTS ON NOZZLES AND FLANGES SHALL BE AS PER		
	LIED BY VENDOR IF REQUIRED FOR PRE-COMMISI		
	PUMP SHALL BE AT LEAST 1 METER LESS THAN N	IPSHA	
Note 10: DESIGN TEMPRATURE RANGE IS			
Note 11: ESTIMATED SHUT-OFF PRESSUR			
Note 12: Ex-group: ExdIIBT4			
Note 13:REFERE TO "UTILITY CONDITION	N" DOC.No.: 900-SPC-A4-PR-0006.		
	Document No.:		Rev.: 0
	Owner Job No.:		Type:DAS
			Page 4 of 4

PROJECT: PP- PE PILOT PLANT	client:	
TITLE: DATA SHEET FOR E-411 COOLING PUMP (P-034)	ى	شر کت ملی صنایع پتروشیمی شر کت پژوهش و فناوری پتروشیم
DATA SHEET FOR E-411 034		Rev.: 0
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PROJECT	: PP- P	'E PILO	T PLAN	١T							client:						6	CXC	2	
TITLE: DA	NTA SH	IEET FO	OR E-41	11 COO	LING P	UMP (P	'-034)										پتروشیمی ی پتروشیمی	ملی صنایع پ وهش و فناور و		
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TITLE: DATA 034)	A SHEET FOR E	E-411 COO	LING PUMP (P-					پتروشیمی	شرکت ملی صنایع شرکت پژوهش و فناو	
			CENTRIFUG	L AL PUMI	P DATA S	SHEET, SI UI	TIV	G .	, , , ,	
1 APPLICABLE 2 FOR 3 SITE	NPC R	NPC R8 &T CENTRE -	ARAK - IRAN	AS BU	UNIT SREVICE	E		CES (000) NG PUMP (P-03	4)	Rev
4 No. of Req'd: 5 NOTES : INFO	2 Service	BE COMPLET			Ву	MANUFACTURER	≳ 🔲 в		ER OR PURCHASER VISIONS	*************
7 PUMP	ITEM NO. P-034	ATTACHED	ITEM NO.	ATTA	ACHED	ITEM NO.	ATTACHED	NO. DATE	BY	
8 PUMP 9 MOTOR	PM-034	+ -					Ö	2		
10 GEAR		Ō					Ŏ	3		
1 TURBINE		0					0	4		4
3 APPLICABLE	OVERLAY STANDARD  OPERATI		STANDARD ONS (5.1.3)				LIQUID	5 (5.1.3)		
4 FLOW, NORM		(m³/h) RA		(m³/h)	LIQUID TYF	PE OR NAME		ΓER + 20% GLY	COLE	
5 OTHER		(Note			HAZAR	DOUS	FLAMMABLE	TOXIC	(5.1.5)	
6 SUCTION PRI	ESSURE MAX / RATED	10.8	5 / 2.5 4	(bara) (bara)	PUMPING 1	TEMP (°C)	MIN. 55	NORMAL 70	. MAX.	-
	L PRESSURE		1.5	(bara)		RESS . (bara)	- 33	0.48	- 00	**********
	15.3	(m) NPSHA	>10 (Note 9)	(m)		DENSITY (SG):		0.96		
	RIATIONS (5.1.4)				VISCOSITY			0.54		
	ONDITIONS (5.1.4)  CONT IN		SED DELIVERY VALV	E	SPECIFIC H		TION (8 F 2 4)	3.82 N/A	(kj/kg .k.)	
_	EL OPERATION REQ'E		STARTS/DAY)		_	NCENTRATION	-		(mg/kg) WET (5.12.1.12c)	
4		ITE DATA (5.	1.3)		<del>,</del> –	/E / EROSIVE AGE		,	(5.12.1.9)	
5 LOCATION: (5	· _		_				MATERIALS	· ·		
T	O HEATED	_	_			( H CLASS (5.12.1.			(°C)	
_	CAL AREA CLASSIFIC I GR	C,T4 DIV			_	ESIGN METAL TEM CED HARDNESS M	-		(°C)	
_	IZATION REQ D.		ALIZATION REQ D.		_			LLER	c.s	
SITE DATA (5	.1.30)	Ü				IMPELLER WEAR	RINGS	C.S		
1 ALTITUD				(mbar)	SHAFT		A	ISI 4140		
=	OF AMBIENT TEMPS:N E HUMIDITY:MIN / MA		-28 / 44 / 86	(°C)	DIFFUS	SERS	PERFOR	MANCE		
_	E HUMIDITY:MIN / MA. DNDITIONS: (5.1.30)		DUST FUMES	(%)	PROPOSAL	CURVE NO.	PERFOR	MANCE	(r/min)	_
OTHER	,	CORRO	_			ER DIA RATED	MAX	. MIN		
6					IMPELL			CLOSE		
7 INDUST		DRIVER TYP			1 —	POWER V	***************************************	EFFICIENCY	(%)	
<u> </u>	ON MOTOR (	STEAM TUR Note)	_		_	JM CONTINUOUS MAL	_	BLE	(m³/h)	
						RRED OPER. REG		TO	(m³/h)	
1		DRIVER (6.1	.1 / 6.1.4)		-	ABLE OPER. REG		то	(m³/h)	
2 MANUFA				(-/i-)		IEAD @ RATED IM	to the second se	***************************************	(m)	
3 FRAME	VIA (K	w)   ENCLOS	SURE	(r/min)		OWER @ RATED R AT RATED FLOW			(kw) (m) (5.1.10)	
5 HORIZOI	NTAL VERTION		SERVICE FACTOR		=	JCTION SPECIFIC	************	13000 M3/Hr,N	<b>//,RPM</b> (5.1.11)	
1=	PHASE / HERTZ	400 /	3 / 5	0		SOUND PRESS LE		85	(dba) (5.1.16)	
7 TYPE	4 074 071 10 1/01 74 01	ASYNCHR	ONOUS			AX. SOUND PRESS			(dba) (5.1.16)	MANAGAN.
	STARTING VOLTAGI	E (6.1.5) TEMP. RISE			ESI MA	AX. SOUND POWE		IS (5.1.3) (NOTE	(dba) (5.1.16)	-
FULL LO					ELECTRICI	- I	DLTAGE	PHASE	HERTZ	
1 C LOCKED					DRIVE	RS	400	3	50	
	G METHOD		D.O.L		HEATIN		O		(2.1.7)	
LUBE	YPE / NUMBER) :				SYSTE	M VOLTAGE DIP MAX. PRESS.	○80% MAX. TEMI	OTHER  MIN. PRES	(6.1.5) S. MIN. TEMP	+
RADIAL	II E / NOWDER).	1			DRIVERS	IVIAA. PRESS.	IVIMA. I EIVII	WIIIN, FRES	O. IVIIIN. I EIVIP	
THRUST		1			HEATING					
_	L THRUST CAPACITY					WATER: (5.1.19)	SOURCE			
B UP	(N)	DOWN		(N)	SUPPLY TE NORM. PRI			RETURN TEMP.	(°C)	
0					MIN. RET. F	*****************		. ALLOW. D.P.	(bar) (bar)	
1 2						CONCENTRATIO			(mg/kg)	
		Do	cument No.:		•				Rev.: 0	
		Ov	vner Job No.:						Type:DAS	
									Page 1 of 4	

PROJECT: PP- PE PILOT PLANT	Client:	
TITLE: DATA SHEET FOR E-411 COOLING PUMP (P-		245 <b>49</b>

STEP.
شركت ملى صنايع پتروشيمي
شرکت پژوهش و فناوری پتروشیمی

LE: DATA SH )	IEET FOR	R E-411 COO	LING PUN	IP (P-		يمى	شرکت ملی صنایع پتروش
						وشيمى	شرکت پژوهش و فناوری پتر
			CEN	TRIFLIGAL	PHM	P DATA SHEET, SI UNIT	
		CONSTRUC		TIMI OUAL	1 0141	SURFACE PREPARATION AND P	PAINT
ROTATION : (VIE	.1) ISO	COUPLING END)		cw 🔲 co	CW	<ul> <li>MANUFACTURER'S STANDARD</li> <li>SPECIFICATION NO.</li> <li>900-SPC-A4-PD</li> </ul>	ER SEE BELOW
CASING MOUNT		OH6	OTHER		~~~~~	PUMP:  PRIMER	
CENTERLIN	IE IN-L	LINE	OTHER			FINISH COAT BASEPLATE: (6.3.1.7)	
CASING TYPE :	_		_			PRIMER	
SINGLE VOI	_	LTIPLE VOLUTE	Ш	DIFFUSER		● FINISH COAT  ■ DETAILS OF LIFTING DEVICES (6.3.20)	
		GION DESIGNED KING PRESSURE	FOR MAWP (5	.3.6)	(bar)	SHIPMENT: (7.4.1)  DOMESTIC EXPORT EXPORT BOX	(ING REQUIRED
<u> </u>	100	(°C)	4		was a	OUTDOOR STORAGE MORE THAN 6 MONTHS	
HYDRO TES			1.5 x MAV lote 7)	VP	(bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR:  HORIZONTAL STORAGE  VERTICAL ST	OPAGE
NOZZEL CC	SIZE	FLANGE	FACG	POSITION		O TYPE OF SHIPPING PREPARATION	ONAGE
OLIOTIO:	0"	RATING	DE.		-	HEATING AND COOLING	
SUCTION	3" 2 1/2"	150# 150#	RF		-	HEATING JACKET REQ D. (5.8.9)	
DISCHARGE	2 1/2"	150#	RF			COOLING REQ D.  COOLING WATER PIPING PLAN (6.5.3.1)	
PRESSURE	CASING ALIX	. CONNECTIONS	: (5.4.3)			C.W. PIPING:	
	2,1010 / 10/	NO.	SIZE (DN)	TYPE		PIPE TUBING: FITTINGS	
DRAIN			1/2"	VALVED		C.W. PIPING MATERIALS:	
VENT			1/2"	VALVED		S.STEEL C.STEEL GALVANI	ZED
WARM-UP						COOLING WATER REQUIREMENTS :	2
						BEARING HOUSING	(m³/h)
		ED CONNECTIONS				HEAT EXCHANGER	(m³/h)
_	AL THREADS I	REQUIRED (5.4.3	.3)			TOTAL COOLING WATER	(m³/h)
ROTOR:						HEAT MEDIUM: O STEAM O OTHER	
-		TO ISO 1940 G 1.0	0 (5.9.4.4)			HEATING PIPING: TUBING PIPE  BEARING AND LUBRICATIO	N
COUPLINGS :(6.  MANUFACTI		VTA •	MODEL SP	ACER (Type T	rsk)	BEARING (TYPE / NUMBER ) (5.10.1):	
RATING (kw			MODEL GI	ACLIT (Type I	011,	RADIAL /	
SPACER LE		TA (mm)	SERVICI	E FACT.		THRUST /	
_		O ISO 1940-1 G 6.				LUBRICATION (5.11.3,5.11.4) :	
_		RIETARY CLAMPIN		2.1.1)		GREASE OIL	
COUPLING	PER ISO 1469	91 (6.2.4)				PURGE OIL MIST PURE OIL MIST	
COUPLING	PER ISO 104	141 (6.2.4)				CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):	
COUPLING	PER ISO		O ASME B	151		OIL VISC. ISO GRADE	
		GUARD (6.2.14C)				INSTRUMENTATION	
COUPLING	GUARD STAN	IDARD PER		(6.	.2.14a)	ACCELEROMETER (6.4.2.1)	
BASEPLATES:  API BASEPL	ATE NI IMPE	5		(ANNEX D)		PROVISION FOR MOUNTING ONLY (5.10.2.11)  FLAT SURFACE REQ D (5.10.2.12)	
O NON-GROU				(ANNLA D)		TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)	
OTHER		(0.0.10)				PRESSURE GAUGE TYPE	
MECHANICAL SE	EAL : (5.8.1)	(Note 4 &	5)		***********		
CATEGORY		,	*				
ARRENGME	NT					REMARKS :	
TYPE							
PLAN	nerver server		01			MASSES	
						MASS OF PUMP (kg)	
						MASS OF BASEPLATE (kg)	
						MASS OF DRIVER (kg)	
						TOTAL MASS (kg)	
		D	ocument N	No.:			Rev.: 0
		-	wner Job				Type:DAS
		F					Page 2 of 4
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TITLE: DATA SHEET FOR E-411 COOLING PUMP



SPARE PAR	TS (TABLE 18)		QA INSPECTION AN	ID TESTIN	IG (CONT.)	
START-UP NORMAL MA	INTENANCE		TEST	NON-WIT	WIT	OBSERVE
OTHERS 2 YEARS OF OPERA	TION LIST (Note 8)		HYDROSTATIC (7.3.2)	0	•	$\overline{}$
OTHER PURCHAS	ER REQUIREMENTS		PERFORMANCE (7.3.3)	Ō	Ŏ	Ō
COORDINATION MEETING REQUIRED	(9.1.3)		O RETEST ON SEAL	Ô	Ó	Ó
MAXIMUM DISCHARGE PRESSURE TO	• •		LEAKAGE (7.3.3.2D)	Ŭ	_	_
O MAX RELATIVE DENSITY	, ,		NPSH (7.3.4.2)	$\circ$		0
O MAX DIA. IMPELLERS AND / OR NO	O OF STAGES		TRUE PEAK VELOCITY	Ŏ	Õ	$\tilde{\circ}$
OPERATION TO TRIP SPEED			DATA (7.3.3.4D)	0		
OH3 BEARING HS6 LIFTER (8.1.2.6)			COMPLETE UNIT TEST (7.3.4.3)	0	$\bigcirc$	0
CONNECTION DESIGN APPROVAL (5.	12 3 4)		SOUND LEVEL TEST (7.3.4.4)	Õ		0
TORSIONAL ANALYSIS REQUIRED (5	*		CLEANLINESS PRIOR TO			$\sim$
			_		$\circ$	0
TORSIONAL ANALYSIS REPORT (5.9.	2.0)		FINAL ASSEMBLY (7.2.2.2)	$\bigcirc$	$\bigcirc$	$\bigcirc$
PROGRESS REPORTS (9.3.3)			NOZZLE LOAD TEST (6.3.6)	$\circ$	$\circ$	$\sim$
OUTLINE OF PROCEDURES FOR OPT	, ,		CHECK FOR CO-PLANNER	0	$\circ$	$\circ$
ADDITIONAL DATA REQUIRING 20 YEA			MOUNTING PAD SURFACE (6.3.3)	$\sim$		$\sim$
	PURTENANCES		MECHANICAL RUN UNIT OIL	0	0	0
NIFOLD PIPING TO SINGLE CONNECTI			TEMP P. STABLE (7.3.4.7.1)	_	_	_
	COOLING WATER		4 HR. MECHANICAL RUN AFTER	0	$\circ$	$\circ$
MOUNT SEAL RESERVOIR OFF BASE	PLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)	_	_	_
FLANGES REQ D IN PLACE OF SOCK	ED WELD UNIONS (6.5.2.8)		4 HR. MECH. RUN TEST (7.3.4.7.2)	0		Q
INSTALLATION LIST IN PROPOSAL (9.	2.3L)		O BRG HSG RESONANCE	0	$\circ$	$\circ$
NNECTION BOLTING			TEST (7.3.4.6)			
OPTFE COATING ASTM A	153 GALVANIZED		O AUXILIARY EQUIPMENT	0	$\circ$	$\circ$
O PAINTED SS			TEST (7.3.4.5)			
QA INSPECTIO	N AND TESTING		IMPACT TESTING (5.12.4.3)	0	0	0
SHOP INSPECTION (7.1.4)	(Note 6)		O PER EN 13445	•	•	
PERFORMANCE CURVE APPROVAL			O PER ASME V III			
TEST WITH SUBSTITUTE SEAL (7.3.3.	2B)			0	$\circ$	0
MATERIAL CERTIFICATION REQUIRED			O VENDOR KEEP REPAIR AND HT RE	•	_	0
CASING IMPELLER	SHAFT		VENDOR SUBMIT TEST PROCEDUR			
OTHER SHAFT SLEEVES, INTERI	•	H. SFAL PARTS	I			
CASTING REPAIR PROCEDURE APPR		0=/.= . /	O INCLUDE PLOTTED VIBRATION SPE		(7.0.0.02)	
INSPECTION REQUIRED FOR CONNE			SUBMIT INSPECTION CHECK LIST (			
	UID PENETRANT		30BWIT INSPECTION CHECK EIST	(7.1.0)		
	TRA SONIC					
INSPECTION REQUIRED FOR CASING						
	UID PENETRANT					
	TRA SONIC	(7.0.0.0)				
HARDNESS TEST REQUIRED :		(7.2.2.3)				
) ADDITIONAL SUBSURFACE EXAMINAT	ION FOR 7.21.3					
FOR		ana .				
METHOD		979				
		REMARKS	3			
				**********		
					***************************************	
		*************************		***		****
	Document	No.:			Rev.:	0
	Owner Jol	b No.:			Type:	:DAS

		client:	
PROJECT: PP- PE PILOT PLANT		unora.	<u>≜</u>
TITLE: DATA SHEET FOR E-411 COOL	LING PUMP (P-034)	يمي وشيمي	شرکت ملی صنایع پتروش شرکت پژوهش و فناوری پتر
Note 1: ALL ELECTRICAL MOTORS SHAL	L BE IN ACCORDANCE WITH "TECHNICAL SPECIFIC	CATION FOR LV MOTOR" DOC.No.	
900-SPC-A4-EE-0005 MOTOR EI	NCLOSURES SHALL BE OF TOTALLY ENCLOSED FA	N-COOLED (TEFC)	
Note 2: TYPE OF PROTECTION SHALL BE	Aexd		
Note 3: DRY, FLEXIBLE , MULTI DISK ,S.S	MEMBRANE SPACER TYPE COUPLING SHALL BE	USED.	
DRIVER HALF COUPLING SHALL	BE MOUNTED BY PUMP MFR.		
Note 4: MECHANICAL SEAL SHALL BE AS FOR MECHANICAL SEALS.	S PER API 682 / ISO 21049 3rd EDITION :2004. VE	ENDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEE	Т
Note 5: VENDOR IS REQUIRED TO REVIE	EW AND CONFIRM.		
Note 6: REFERE TO "INSPECTION & TEST	T PLAN FOR CENTRIFUGAL PROCESS PUMPS" DO	C.No.: 900-ITP-A4-RE-0001.	
Note 7: ALLOWABLE LOAD AND MOME	NTS ON NOZZLES AND FLANGES SHALL BE AS PER	R ISO STANDARD	
Note 8: SPECIAL TOOLS SHALL BE SUPPI MAINTANANCE PERIOD.	LIED BY VENDOR IF REQUIRED FOR PRE-COMMIS	IONNING,COMMISIONING,START-UP AND	
Note 9: NPSH REQUIRED FOR SELECTED	PUMP SHALL BE AT LEAST 1 METER LESS THAN I	NPSHA.	
Note 10: DESIGN TEMPRATURE RANGE I	S: -30 /100 °C.		
Note 11: ESTIMATED SHUT-OFF PRESSUR	RE IS 4.8 BARA.		
Note 12: Ex-group: ExdIIBT4			
Note 13:REFERE TO "UTILITY CONDITION	N" DOC.No.: 900-SPC-A4-PR-0006.		
	Document No.:		Rev.: 0
	Owner Job No.:		Type:DAS
			Page 4 of 4

PROJECT: PP- PE PILOT PLANT	client:			
TITLE: DATA SHEET FOR E-421 COOLING PUMP (P-035)		شر کت ملی صنایع پتروشیمو شر کت پژوهش و فناوری پتروش		
DATA SHEET FOR E-421 035		Rev.: 0		
Owner Job No.:		Type:DAS		
		Page A		

PROJECT	ECT: PP- PE PILOT PLANT  : DATA SHEET FOR E-421 COOLING PUMP (P-035)											client:									
	ATA SH	EET FO	OR E-42	21 COO	LING P	UMP (P	-035)											شرکت ملی صنایع پتروه شرکت پژوهش و فناوری پت			
REV.	0	1	2	3	4	5	REV.	0	1	2	3	4	5	REV. PAGE	0	1	2	3	4	5	
Α	Х																				
В	Х																				
1	X																				
3	x																				
4	x																				
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5																					
3																					
2																					
1																					
0	12	2/30/20	21			K.A					M.N				AA.S	н			IFA		
Rev	Date Prepareed By							CI	necked	ву			Approv	ed by			Statu	s			
									Docu	ment R	evision										
						Docun	nent No.	:										Rev.: 0			
						Owner	Job No.	.:										Type:DAS			
												Page B									



03		SHEET FOR E-	421 000	LING PUMP (P-		شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی							
	•			CENTRIFUG	L AL PUMI	DATA S	SHEET, SI U	NIT		<u> </u>	10 33. 1		
1	APPLICABLE '	TO: PROPOS	SAL C	PURCHASE	AS BUI	LT	,					Rev	
	FOR	NDO DO	NPC R	RT - ARAK - IRAN		UNIT		SERVI					
	SITE No. of Reg'd:		1 / Stand I			SREVICE		E-421 COOLI	NG P	UNIP (P-035)			
5		RMATION BELOW TO			CHASER	□ву	MANUFACTURE	r 🖸 e	BY MAI	NUFACTURER	OR PURCHASER		
6				DATA SHEETS							SIONS		
7		ITEM NO.	ATTACHED	ITEM NO.		CHED	ITEM NO.	ATTACHED		DATE	BY		
	PUMP MOTOR	P-035 PM-035						0	2				
	GEAR	FIWI-035	0										
	TURBINE		Ŏ					Ŏ	3			***************************************	
12	APPLICABLE (	OVERLAY STANDARD(	-,	STANDARD	•				5				
13		OPERATIN		· ,	. 3	LIQUID (5.1.3)							
	FLOW, NORM OTHER	AL 50	(m³/h) RA ( <b>Note</b> )	************************	(m³/h)	HAZAR	PE OR NAME	) FLAMMABLE		TOXIC	(5.1.5)	************	
		ESSURE MAX / RATED	10.8		(bara)	HAZAR	0003	MIN.		NORMAL	(5.1.5) MAX.		
	DISCHARGE I			4	(bara)	PUMPING 1	EMP (°C)	55		70	80		
18	DIFFERENTIA	L PRESSURE		1.5	(bar)	VAPOUR P	RESS . (bara)			0.48			
	DIFF. HEAD		(m) NPSHA	>10 (Note 9)	(m)		DENSITY (SG):		$\dashv$	0.96			
		RIATIONS (5.1.4) ONDITIONS (5.1.4)	CLC	SED DELIVERY VALV	/F	VISCOSITY SPECIFIC F	` '		3.8	0.54	(kj/kg .k.)	***************************************	
		CONT (5.1.4)			_		RIDE CONCENTR	ATION (6.5.2.4)			(KJ/Kg .K.) (mg/kg)		
		EL OPERATION REQ'D				_	NCENTRATION				VET (5.12.1.12c)		
24		SIT	E DATA (5.	1.3)		CORROSIV	E / EROSIVE AGE				(5.12.1.9)		
	LOCATION: (5		0 000					MATERIAL			`	**************	
26 27	~	○ HEATED CAL AREA CLASSIFICA	~	•		_	H CLASS (5.12.1 SIGN METAL TEI			S-5 (Note 5	(°C)		
28	_	I GR				$\sim$				5.12.1.12)	( 0)		
29		ZATION REQ D.				© REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)  ■ BARREL / CASE C.S IMPELLER C.S							
30	SITE DATA (5.		_			CASE / IMPELLER WEAR RINGS C.S							
31	_	E 1889 (m)			(mbar)	SHAFT		Α	ISI 41	40			
32	Ξ	OF AMBIENT TEMPS:MI E HUMIDITY:MIN / MAX		-28 / 44 / 86	(°C) (%)	DIFFUS	SERS	PERFOR	MANI	CE			
	_	NDITIONS: (5.1.30)		DUST FUMES	(70)	PROPOSAL	. CURVE NO.	FERIOR	INIMIA		(r/min)		
35	OTHER		CORRO				ER DIA RATED	MAX		MIN	(mm)	***************************************	
36						■ IMPELL				LOSE			
37	_		RIVER TYP			1 =	POWER V		EFFIC	IENCY	(%)	***********	
38 39	OTHER	_	STEAM TUR	_		MINIMUM CONTINUOUS FLOW:  THERMAL (m³/h) STABLE (m²/h)							
40	OTTIER		(1401)	5 1)		THERMAL (m³/h) STABLE (m³/h)  PREFERRED OPER. REGION TO (m³/h)							
41		MOTOR I	DRIVER (6.	1.1 / 6.1.4)		ALLOWABLE OPER. REGION TO (m³/h)							
42	MANUFA						EAD @ RATED IN				(m)		
43		VTA (kw)			(r/min)	MAX. POWER @ RATED IMPELLER (kw)							
44 45	FRAME HORIZON	NTAL VERTICA	ENCLO	SURE SERVICE FACTOR		NPSHR AT RATED FLOW (m) (5.1.10)  MAX SUCTION SPECIFIC SPEED: 13000 M3/Hr.M.RPM (5.1.11)							
			400 /	-	0	MAX SUCTION SPECIFIC SPEED: 13000 M3/Hr,M,RPM (5.1.11) MAX . SOUND PRESS LEVEL REQ. D 85 (dba) (5.1.16)							
	TYPE		ASYNCHE			MAX . SOUND PRESS LEVEL REQ. D 85 (dba) (5.1.16)  EST MAX. SOUND PRESS LEVEL (dba) (5.1.16)							
		STARTING VOLTAGE				EST MA	XX. SOUND POW				(dba) (5.1.16)		
49	INSULAT		TEMP. RISE			FLECTRIC		Y CONDITION	·		•	***************************************	
	FULL LO	AD AMPS ROTOR AMPS				ELECTRICI DRIVER		OLTAGE 400	ı	PHASE 3	HERTZ 50	***************************************	
52	STARTIN			D.O.L		HEATIN				-			
	LUBE	ASSESSED					M VOLTAGE DIP	○80%	(	OTHER	(6.1.5)		
	_	YPE / NUMBER) :	and the second			STEAM	MAX. PRESS.	MAX. TEM	Р	MIN. PRESS	MIN. TEMP		
55 56	RADIAL		1			DRIVERS			+				
56 57	THRUST VERTICA	L THRUST CAPACITY				HEATING COOLING V	VATER: (5.1.19)	SOURCE					
58	UP	(N)	DOWN		(N)	SUPPLY TE				JRN TEMP.	(°C)		
59						NORM. PRI		(bar) DES		RESS.	(bar)		
60						MIN. RET. PRESS. (bar) MAX. ALLOW. D.P. (bar)							
61						CHLORIDE CONCENTRATION :(mg/kg)							
62			Do	ocument No.:							Rev.: 0		
			$\vdash$	wner Job No.:							Type:DAS		
1											Page 1 of 4		

PROJECT: PP- PE PILOT PLANT	Client:	
TITLE: DATA SHEET FOR E-421 COOLING PUMP (P-		کے گاہی۔ شرکت ملی صنایع پتروشیمی

ITLE: DATA SH	HEET FOR	R E-421 COO	LING PUMP (	P-		وکار کار کار کار کار کار کار کار کار کار					
35)						شرکت پژوهش و فناوری پتروش					
				FUGAL PU	MP DATA SHEET, SI UNIT						
1	EWED EDOM	CONSTRUCT			SURFACE PREPARATION AND						
2 ROTATION : (VIE 3 PUMP TYPE : (4		COUPLING END)	☐ CW	ccw	<ul><li>✓ MANUFACTURER'S STANDARD</li><li>✓ SPECIFICATION NO.</li><li>900-SPC-A4-</li></ul>	THER SEE BELOW PD-0002					
		ОН6	OTHER		PUMP :						
5 CASING MOUNT	_				PRIMER	one-money and the second secon					
6 CENTERLIN	NE 🔲 IN-I	LINE	OTHER		FINISH COAT						
7					BASEPLATE : (6.3.1.7)						
8 CASING TYPE :					PRIMER						
9 SINGLE VOI	_	LTIPLE VOLUTE	DIFF	USER	● FINISH COAT  ■ DETAILS OF LIFTING DEVICES (6.3.20)						
_		GION DESIGNED I	FOR MAWP (5.3.6)		SHIPMENT : (7.4.1)						
		KING PRESSURE		(ba		OXING REQUIRED					
13 @	100	(°C)			OUTDOOR STORAGE MORE THAN 6 MONTHS	anamanana 					
14 HYDRO TES			1.5 x MAWP	(ba	ar) SPARE ROTOR ASSEMBLY PACKAGED FOR :						
15 NOZZLE CO			ote 7)		HORIZONTAL STORAGE OVERTICAL	STORAGE					
16	SIZE	FLANGE RATING	FACG F	OSITION	TYPE OF SHIPPING PREPARATION     HEATING AND COOLIN	G					
17 18 SUCTION	4"	150#	RF		HEATING AND COOLIN						
19 DISCHARGE	3 1/2"	150#	RF		COOLING REQ D.	and the second s					
20		1			COOLING WATER PIPING PLAN (6.5.3.1)	denominano					
21 PRESSURE	CASING AUX	. CONNECTIONS	: (5.4.3)		C.W. PIPING:						
22		NO.	SIZE (DN)	TYPE	PIPE TUBING: FITTINGS	0.000,000,000					
23 DRAIN			+ + + + + + + + + + + + + + + + + + + +	ALVED	C.W. PIPING MATERIALS:	on an armony and a second and a					
24 VENT			1/2" \	ALVED	S.STEEL C.STEEL GALVA	ANIZED					
25 WARM-UP					COOLING WATER REQUIREMENTS:	(m <sup>3</sup> /h)					
26 MACHINED	AND STUDDE	D CONNECTIONS	5 : (5 4 3 8)		BEARING HOUSING HEAT EXCHANGER	(m <sup>3</sup> /h) (m <sup>3</sup> /h)					
28 O CYLINDRICA					TOTAL COOLING WATER	(m <sup>3</sup> /h)					
29 ROTOR :		(20.			HEAT MEDIUM: O STEAM OTHE	vannennennennennennennennennennen vannen vannen vannen vannen vannen vannen vannen van van van van van van van					
30 COMPONEN	NT BALANCE	TO ISO 1940 G 1.0	(5.9.4.4)		HEATING PIPING : O TUBING PIPE	None and a second					
31 COUPLINGS :(6.					BEARING AND LUBRICAT	ION					
32 MANUFACTI			MODEL SPACE	R (Type TSK		Assessment of the Contract of					
33 RATING (kw			C SERVICE FAC	۲T	RADIAL /						
34 SPACER LE 35 COUPLING			SERVICE FAC 3 (6.2.3)		LUBRICATION (5.11.3,5.11.4):						
36 COUPLING					GREASE OIL	, and an area					
37 O COUPLING			(0.2.1.1)		O PURGE OIL MIST OPURE OIL MIST	annoninen m					
38 O COUPLING					CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):						
39 COUPLING	PER ISO		ASME B151		OIL VISC. ISO GRADE						
40 NON SPARK		, ,			INSTRUMENTATION	e con de si con					
41 COUPLING	GUARD STAN	IDARD PER		(6.2.14	a) ACCELEROMETER (6.4.2.1)						
42 BASEPLATES: 43 API BASEPL	Ι ΔΤΕ ΝΙΙΙΜΩΕΓ	<b>&gt;</b>		(ANNEX D)	PROVISION FOR MOUNTING ONLY (5.10.2.11)	CARGOS CO.					
44 NON-GROU				(CININEV D)	FLAT SURFACE REQ D (5.10.2.12)  TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)	40.000.00					
45 OTHER		(0.0.10)			PRESSURE GAUGE TYPE						
46 MECHANICAL SE	EAL: (5.8.1)	(Note 4 & 5	5)								
47 CATEGORY	/										
48 ARRENGME	ENT				REMARKS :						
49 TYPE	***		04		MACCEC	And Andrew					
50 PLAN	ananananan		01	***************************************	MASS OF DIMP (kg)	10000000					
51 52					MASS OF PUMP (kg)  MASS OF BASEPLATE (kg)						
53					MASS OF DRIVER (kg)						
54					TOTAL MASS (kg)						
55											
56						(0.000 0.000					
		Do	ocument No.:			Rev.: 0					
		$\vdash$									
		O	wner Job No.	:		Type:DAS					
						Page 2 of 4					

TITLE: DATA SHEET FOR E-421 COOLING PUMP (P-035)



(P-035) CENTRIFUGAL PUMP DATA SHEET, SI UNIT **SPARE PARTS (TABLE 18)** QA INSPECTION AND TESTING (CONT.) NON-WIT START-UP NORMAL MAINTENANCE TEST WIT OBSERVE OTHERS 2 YEARS OF OPERATION LIST (Note 8) HYDROSTATIC (7.3.2)  $\bigcirc$  $\circ$ OTHER PURCHASER REQUIREMENTS 0 0 PERFORMANCE (7.3.3) 0 0 0 COORDINATION MEETING REQUIRED (9.1.3) O RETEST ON SEAL 6 MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2) LEAKAGE (7.3.3.2D) O MAX RELATIVE DENSITY NPSH (7.3.4.2) MAX DIA. IMPELLERS AND / OR NO OF STAGES Ò TRUE PEAK VELOCITY OPERATION TO TRIP SPEED DATA (7.3.3.4D) 10 OH3 BEARING HS6 LIFTER (8.1.2.6) 0 OCMPLETE UNIT TEST (7.3.4.3)  $\bigcirc$ 11 CONNECTION DESIGN APPROVAL (5.12.3.4) SOUND LEVEL TEST (7.3.4.4)  $\circ$ 12 TORSIONAL ANALYSIS REQUIRED (5.9.2.1) CLEANLINESS PRIOR TO 13 O TORSIONAL ANALYSIS REPORT (5.9.2.6) FINAL ASSEMBLY (7.2.2.2) 14 PROGRESS REPORTS (9.3.3) O NOZZLE LOAD TEST (6.3.6) 15 OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5) CHECK FOR CO-PLANNER 16 ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f) MOUNTING PAD SURFACE (6.3.3) PIPING AND APPURTENANCES 0 0 0 MECHANICAL RUN UNIT OIL 18 MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6) TEMP P. STABLE (7.3.4.7.1) VENT DRAIN COOLING WATER  $\circ$ 0 4 HR. MECHANICAL RUN AFTER  $\bigcirc$ 20 MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4) OIL TEMP STABLE (7.3.4.7.3) 21 FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8) 4 HR. MECH. RUN TEST (7.3.4.7.2) 0 22 INSTALLATION LIST IN PROPOSAL (9.2.3L) O BRG HSG RESONANCE 23 CONNECTION BOLTING TEST (7.3.4.6) OPTFE COATING ASTM A153 GALVANIZED O AUXILIARY EQUIPMENT 0 0 0 24 25 OPAINTED ss TEST (7.3.4.5) **QA INSPECTION AND TESTING** IMPACT TESTING (5.12.4.3)  $\circ$  $\circ$  $\circ$ SHOP INSPECTION (7.1.4) (Note 6) O PER EN 13445 28 PERFORMANCE CURVE APPROVAL O PER ASME V III 29 TEST WITH SUBSTITUTE SEAL (7.3.3.2B) 0 0 30 MATERIAL CERTIFICATION REQUIRED (5.12.1.8) O VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1C) IMPELLER ● VENDOR SUBMIT TEST PROCEDURES (7.3.1.2 / 9.2.5) CASING SHAFT ● OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS ○ VENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E) 33 CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5) O INCLUDE PLOTTED VIBRATION SPECTRA (A 34 INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e) ■ SUBMIT INSPECTION CHECK LIST (7.1.6) MAG PARTICLE LIQUID PENETRANT RADIOGRAPHIC ULTRA SONIC 37 INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5) MAG PARTICLE LIQUID PENETRANT RADIOGRAPHIC ULTRA SONIC 40 HARDNESS TEST REQUIRED : (7.2.2.3)41 ADDITIONAL SUBSURFACE EXAMINATION FOR 7.2..1.3 42 43 METHOD 44 45 REMARKS 47 48 49 50 51 52 53 54 55 **Document No.:** Rev.: 0 Owner Job No.: Type:DAS Page 3 of 4

		Leant	
PROJECT: PP- PE PILOT PLANT		client:	
TITLE: DATA SHEET FOR E-421 COOL	LING PUMP (P-035)	يمى وشيمى	شرکت ملی صنایع پتروش شرکت پژوهش و فناوری پتر
Note 1: ALL ELECTRICAL MOTORS SHALE	L BE IN ACCORDANCE WITH "TECHNICAL SPECIFIC	CATION FOR LV MOTOR" DOC.No.	
900-SPC-A4-EE-0005 MOTOR E	NCLOSURES SHALL BE OF TOTALLY ENCLOSED FAI	N-COOLED (TEFC)	
Note 2: TYPE OF PROTECTION SHALL BE			
	S MEMBRANE SPACER TYPE COUPLING SHALL BE I	JSED.	
DRIVER HALF COUPLING SHALL			_
	S PER API 682 / ISO 21049 3rd EDITION :2004. VE	NDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEE	Т
FOR MECHANICAL SEALS.  Note 5: VENDOR IS REQUIRED TO REVIE	TWAND CONFIDM		
	T PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC	No : 900-ITP-4/1-RE-0001	
	INTS ON NOZZLES AND FLANGES SHALL BE AS PER		
	LIED BY VENDOR IF REQUIRED FOR PRE-COMMISI		
	PUMP SHALL BE AT LEAST 1 METER LESS THAN N	PSHA	
Note 10: DESIGN TEMPRATURE RANGE IS			
Note 11: ESTIMATED SHUT-OFF PRESSUR			
Note 12: Ex-group: ExdIIBT4			
Note 13:REFERE TO "UTILITY CONDITION	N" DOC.No.: 900-SPC-A4-PR-0006.		
	Document No.:		Rev.: 0
	Owner Job No.:		Type:DAS
			Page 4 of 4

PROJECT: PP- PE PILOT PLANT		client:	<u>♣</u>
TITLE: DATA SHEET FOR JACKET RV	VA PUMP (R251) (P-022)	می شیمی	شرکت ملی صنایع پتروشی شرکت پژوهش و فناوری پترو
	DATA SHEET FOR		
	PUMP (R251	l) (P-022)	
	Document No.: 000-DAS-A4-RE-0002		Rev.: 0
	Owner Job No.:		Type:DAS
			Page A

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PRO.	JECT:	PP.	PF	PII	OT	PI	$\Delta N$



TIT	TLE: DATA SHEET FOR JACKET RWA PUMP (R251) (P-022)														
				CENTRIFU	GAL PUM	P DATA	SHEET	, SI UI	NIT						
1	APPLICABLE	ETO: PROF	POSAL O	PURCHASE	AS B	UILT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						Rev		
	FOR	NDO	NPC R			UNIT		14.0	SERVIC						
3	SITE  No. of Reg'd:		ce: 1 / Stand b	- ARAK - IRAN		SREVICE JACKET RWS PUMP (R251) (P-022)									
5				PLETED O BYP	URCHASER	В	′ MANUFA(	CTURER	R D BY	MAN	UFACTUREF	R OR PURCHASER	1		
6				DATA SHE								ISIONS			
7		ITEM NO.	ATTACHED	ITEM NO.		ACHED	ITEM N	0.	ATTACHED	-	DATE	BY			
8	PUMP	P-022				0			0	1					
9	MOTOR GEAR	PM-022				$\stackrel{\circ}{\sim}$			$\sim$	3					
	TURBINE		Ŏ			<del>ŏ  </del>									
12	APPLICABLE	E OVERLAY STANI	DARD(S): ISO	STANDARD				************							
13	-	OPERAT				LIQUID (5.1.3)									
	FLOW, NOR	MAL 15	(m³/h) RA1	*************************	(m³/h)	LIQUID TYI		energen and a contract of		*****	20% GLYC				
	OTHER SUCTION P	RESSURE MAX / R	(Not ATED 10.8	<b>-</b>	<b>5</b> (bara	HAZAF	RDOUS	0	FLAMMABLE MIN.	1	TOXIC NORMAL	(5.1.5) MAX.			
		E PRESSURE		4.6		PUMPING	TEMP (°C)		10	_	25	55			
18	DIFFERENT	IAL PRESSURE		2.1	(bar)	VAPOUR P	RESS . (ba	ıra)	0.012		0.031	0.154			
	DIFF. HEAD	**********************	(m) NPSHA	>10 (Note 9	<b>9)</b> (m)	RELATIVE		SG):	1.01		1.03	1.04			
		ARIATIONS (5.1.4)		SED DELIVERY V	AT VE	VISCOSITY SPECIFIC I			1.93	2.3	1.38	0.78	-		
		CONDITIONS (5.1.4		SED DELIVERY V (STARTS/DAY)	~LVĽ			CENTRA	ATION (6.5.2.4	~~~~~	N/A	(kj/kg .k.) (mg/kg)			
23	_	EL OPERATION R				_			<b>N/A</b> (mol			WET (5.12.1.12c)			
24			SITE DATA (5	.1.3)		CORROSIN	/E / EROSI					(5.12.1.9)			
	LOCATION: (5.1.30) MATERIALS (5.12.1.1)														
26 27	_	R HEATED RICAL AREA CLASS	_	•			1) IP (5.12.4.1)	~~~~~	S-5 (Note	<b>5)</b> (°C)					
28	CL				2)	_				EQ D	. (5.12.1.12)	( 0)			
29	_			ALIZATION REQ D.		REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)  BARREL / CASE C.S IMPELLER C.S									
30	SITE DATA (	(5.1.30)	-			CASE	IMPELLER	R WEAR	RINGS		C.S	***************************************			
31	_	DE <b>1889</b> (1			(mbar)	SHAFT	~~~~~~~~~	~~~~~~~~~		c.s	~~~~		***********		
32	I	OF AMBIENT TEM		-28 /	44 (°C)	☐ DIFFU:	SERS		PERFORM	ANC	·E				
33 34	_	VE HUMIDITY:MIN A CONDITIONS: (5.1.3		DUST FUM	86 (%) FS	PROPOSA	L CURVE N		F LIKI OKW	AIVO		(r/min)			
35	OTHER		CORR	_		l	LER DIA RA	energen announcement	MAX	ζ.	MIN	(mm)	***************************************		
36						IMPELLER TYPE									
37			DRIVER TY	_		RATED POWER (kw) EFFICIENCY (%)									
38 39	OTHER		STEAM TUR	BINE GEA te 1)	R	MINIMUM CONTINUOUS FLOW:									
40	OTHER		(NO	le i)		THERMAL (m³/h) STABLE (m³/h)  PREFERRED OPER. REGION TO (m³/h)									
41		МОТО	R DRIVER (6.	1.1 / 6.1.4)		=	VABLE OPE				ТО	(m³/h)			
42	MANUF	ACTURER				MAX. F	IEAD @ RA	ATED IM	PELLER			(m)			
43		2.2 (	(w)		(r/min)	1=	_		IMPELLER			(kw)			
44 45	☐ FRAME	NTAL VERT	ENCLOS	SURE SERVICE FACTOR		_	R AT RATE		SPEED:	120	00 M3/U+ M	(m) (5.1.10) I,RPM (5.1.11)			
		PHASE / HERTZ			50				VEL REQ. D	.50	85	(dba) (5.1.11)			
47	TYPE	enene	ASYNCH			_	AX. SOUNI					(dba) (5.1.16)			
		M STARTING VOL				EST M	AX. SOUNI					(dba) (5.1.16)			
49	INSULA		TEMP. RISE			EL FOTDIO	ITV		TY CONDIT		<del></del>	LICOTZ			
		DAD AMPS  ROTOR AMPS				ELECTRIC DRIVE	l l		LTAGE 400		PHASE 3	HERTZ 50			
52	=	NG METHOD		D.O.L		HEATI	- t				-				
	LUBE						M VOLTAG	E DIP	○80%		OTHER	(6.1.5)			
		(TYPE / NUMBER) :				STEAM	MAX. P	RESS.	MAX. TEM	ΡŢ	MIN. PRES	S. MIN. TEMP			
55 56	RADIAL		1			DRIVERS				$\dashv$			-		
56 57	THRUST VERTIC	I AL THRUST CAPA				HEATING COOLING	WATER: (	5.1.19)	SOURCE				************		
58	_	(N)	DOWN		(N)	SUPPLY TE			0		TURN TEMP.	(°C)			
59						NORM. PR			(bar) DES	SIGN	PRESS.	(bar)			
60						MIN. RET. I				X. AL	LOW. D.P.	(bar)			
61 62						CHLORIDE	CONCEN	TRATIO	N:		**********************	(mg/kg)	************		
02				No: 000-D	00-DAS-A4-RE-0002 Rev.: 0										
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PROJECT: PP- PE PILOT PLANT  ITLE: DATA SHEET FOR JACKET RWA PUMP (R251) (P-022)	Client:	
TITLE: DATA SHEET FOR JACKET RWA PUMP (R251) (P-022)		شر کت ملی صنایع پتروشیمی شر کت پژوهش و فناوری پتروشیمی

	CENTRIFUGAL PUMP	MP DATA SHEET, SI UNIT				
CONSTRUCTION		SURFACE PREPARATION AND PAINT R				
2 ROTATION : (VIEWED FROM COUPLING END)		MANUFACTURER'S STANDARD OTHER SEE BELOW				
3 PUMP TYPE : (4.1)		SPECIFICATION NO. 900-SPC-A4-PD-0				
4 OH1 OH3 OH6 OT	HER	PUMP :				
5 CASING MOUNTING :		PRIMER				
6 CENTERLINE IN-LINE OT	HER	FINISH COAT				
7		BASEPLATE: (6.3.1.7)				
8 CASING TYPE :		PRIMER				
9 SINGLE VOLUTE MULTIPLE VOLUTE	DIFFUSER	FINISH COAT				
10 CASE PRESSURE RATING :		DETAILS OF LIFTING DEVICES (6.3.20)				
11 O OH6 PUMP SUCTION REGION DESIGNED	FOR MAWP (5.3.6)	SHIPMENT : (7.4.1)				
12 MAX. ALLOWABLE WORKING PRESSURE	(bar)	O DOMESTIC EXPORT EXPORT BOXIN	G REQUIRED			
13 @ <b>100</b> (°C)		OUTDOOR STORAGE MORE THAN 6 MONTHS				
14 HYDRO TEST PRESSURE	1.5 x MAWP (bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR:				
15 NOZZLE CONNECTIONS : (5.4.2) (Note	7)	O HORIZONTAL STORAGE OVERTICAL STOR	RAGE			
	FACG POSITION	O TYPE OF SHIPPING PREPARATION				
17 RATING		HEATING AND COOLING				
18 SUCTION 2" 150#	RF	HEATING JACKET REQ D. (5.8.9)				
19 DISCHARGE 1 1/2" 150#	RF	COOLING REQ D.				
20		COOLING WATER PIPING PLAN (6.5.3.1)				
21 PRESSURE CASING AUX. CONNECTIONS	<del>` ` ` </del>	C.W. PIPING:				
<u> </u>	ZE (DN) TYPE	PIPE TUBING: FITTINGS				
23 DRAIN	1/2" VALVED	C.W. PIPING MATERIALS:				
24 VENT	1/2" VALVED	S.STEEL C.STEEL GALVANIZE	:D			
25 WARM-UP		COOLING WATER REQUIREMENTS :	. 3			
26		BEARING HOUSING	(m³/h)			
27 MACHINED AND STUDDED CONNECTIONS		HEAT EXCHANGER	(m³/h)			
28 CYLINDRICAL THREADS REQUIRED (5.4.3	.3)	TOTAL COOLING WATER	(m³/h)			
29 ROTOR :		HEAT MEDIUM: STEAM OTHER				
30 COMPONENT BALANCE TO ISO 1940 G 1.0	(5.9.4.4)	HEATING PIPING: O TUBING O PIPE				
31 COUPLINGS :(6.2.2)		BEARING AND LUBRICATION				
32 MANUFACTURER MO	DEL	BEARING (TYPE / NUMBER ) (5.10.1):				
33 RATING (kw per100 r/min)		RADIAL /				
	SERVICE FACT.	THRUST				
35 COUPLING BALANCED TO ISO 1940-1 G 6.	, ,	LUBRICATION (5.11.3,5.11.4) :				
36 COUPLING WITH PROPRIETARY CLAMPIN	G DEVICE (6.2.1.1)	GREASE OIL				
37 O COUPLING PER ISO 14691 (6.2.4)		PURGE OIL MIST PURE OIL MIST  CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):				
38 COUPLING PER ISO 10441 (6.2.4)	1 4 0 1 5 B 4 5 4	CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):				
🖺	ASME B151	OIL VISC. ISO GRADE				
40 NON SPARK COUPLING GUARD (6.2.14C)	(0.0.44=)	INSTRUMENTATION				
41 COUPLING GUARD STANDARD PER	(6.2.14a)					
42 BASEPLATES:	(ANNEY D)	PROVISION FOR MOUNTING ONLY (5.10.2.11)	$\vdash$			
43 API BASEPLATE NUMBER  44 NON-GROUT CONSTRUCTION (6.3.13)	(ANNEX D)	FLAT SURFACE REQ D (5.10.2.12)	<del>                                     </del>			
45 OTHER		TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6) PRESSURE GAUGE TYPE				
46 MECHANICAL SEAL : (5.8.1) (Note 4 & 5	<u> </u>	O FILESTORE GAUGE TIPE				
47 CATEGORY	·1		——————————————————————————————————————			
48 ARRENGMENT		REMARKS:				
49 TYPE			———— <u> </u>			
50 PLAN	01	MASSES				
51	_ <del></del> -	MASS OF PUMP (kg)				
52		MASS OF BASEPLATE (kg)				
53		MASS OF DRIVER (kg)	——————————————————————————————————————			
54		TOTAL MASS (kg)	——————————————————————————————————————			
55						
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	Document No.: 000	-DAS-A4-RE-0002	Rev.: 0			
	Owner Job No.:		Type:DAS			

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	CENTRIFUG	AL PUMP	DATA SHEET, SI UNIT				
1	SPARE PARTS (TABLE 18)		QA INSPECTION AN	ID TESTING	(CONT	.)	Rev.
2	START-UP NORMAL MAINTENANCE		TEST	NON-WIT	WIT	OBSERVE	
3	OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	0		$\overline{}$	
4	OTHER PURCHASER REQUIREMENTS		PERFORMANCE (7.3.3)	Ó		Ó	
5	COORDINATION MEETING REQUIRED (9.1.3)		O RETEST ON SEAL	0	$\circ$	$\circ$	
6	MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)				
7	O MAX RELATIVE DENSITY		NPSH (7.3.4.2)	0		$\circ$	
8	O MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCITY	0	$\circ$	$\circ$	
9	OPERATION TO TRIP SPEED		DATA (7.3.3.4D)				
10	OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.3)	0	$\circ$	$\circ$	
11	CONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	0		$\circ$	
12	TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		$\circ$	$\circ$	
13	O TORSIONAL ANALYSIS REPORT (5.9.2.6)		FINAL ASSEMBLY (7.2.2.2)				
14	PROGRESS REPORTS (9.3.3)		O NOZZLE LOAD TEST (6.3.6)	$\circ$	$\circ$	$\circ$	
15	OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	$\circ$	$\circ$	$\circ$	
16	ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f)		MOUNTING PAD SURFACE (6.3.3)	_		_	
17	PIPING AND APPURTENANCES		MECHANICAL RUN UNIT OIL	0	$\circ$	$\circ$	
18	MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		TEMP P. STABLE (7.3.4.7.1)	_		_	
19	VENT DRAIN COOLING WATER		4 HR. MECHANICAL RUN AFTER	0	$\circ$	$\circ$	
20	MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)		_	_	
21	FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)		4 HR. MECH. RUN TEST (7.3.4.7.2)	O		O	
22	INSTALLATION LIST IN PROPOSAL (9.2.3L)		O BRG HSG RESONANCE	O	$\circ$	O	
23	CONNECTION BOLTING		TEST (7.3.4.6)		$\overline{}$		
24	PTFE COATING ASTM A153 GALVANIZED		O AUXILIARY EQUIPMENT	O	$\circ$	O	
25	QA INSPECTION AND TESTING		TEST (7.3.4.5)	$\sim$	$\overline{}$		
26			IMPACT TESTING (5.12.4.3)	O	$\circ$	$\circ$	
27 28	SHOP INSPECTION (7.1.4) (Note 6)  PERFORMANCE CURVE APPROVAL		PER EN 13445 PER ASME V III				
	<u> </u>			$\circ$	$\overline{}$		
29	TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		O VENDOD VEED DEDAID AND LIT DE	•	0	0	
30	MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT RE	•			
31	<ul> <li>CASING</li> <li>■ IMPELLER</li> <li>■ SHAFT</li> <li>■ OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MEC</li> </ul>	CH CEAL DADT	VENDOR SUBMIT TEST PROCEDUR	•	-	`	
	CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)	on. SEAL PART	S VENDOR SUBMIT TEST DATA WITH    O INCLUDE PLOTTED VIBRATION SPE		1.3.3.3⊑	)	
33 34	INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)		SUBMIT INSPECTION CHECK LIST (				
35	MAG PARTICLE LIQUID PENETRANT		30BWIT INSPECTION CHECK LIST	(7.1.0)			
36	RADIOGRAPHIC ULTRA SONIC						
37	INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)						
38	MAG PARTICLE LIQUID PENETRANT						
39	RADIOGRAPHIC ULTRA SONIC						***********
40	ARDNESS TEST REQUIRED :	(7.2.2.3)					
41	ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3						
42	FOR						
43	METHOD	and					
44		name.					
45		REMARKS	S				
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	client:	
PROJECT: PP- PE PILOT PLANT		<u>\$</u>
TITLE: DATA SHEET FOR JACKET RWA PUMP (R251) (P-022)	ىيمى وشيمى	شرکت ملی صنایع پتروش شرکت پژوهش و فناوری پتر
lote 1: ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH "TE	CHNICAL SPECIFICATION FOR LV MOTOR" DOC.No.	
900-SPC-A4-EE-0005 MOTOR ENCLOSURES SHALL BE OF TOTAL	LY ENCLOSED FAN-COOLED (TEFC)	
Note 2: TYPE OF PROTECTION SHALL BE Aexd		
Note 3: DRY, FLEXIBLE , MULTI DISK ,S.S MEMBRANE SPACER TYPE COU	IPLING SHALL BE USED.	
DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR.		
Note 4: MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 3rd E	DITION :2004. VENDOR SHALL FILL OUT API 682 (3rd E	D.) DATA SHEET
FOR MECHANICAL SEALS.		
Note 5: VENDOR IS REQUIRED TO REVIEW AND CONFIRM.		
Note 6: REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL PROC	CESS PUMPS" DOC.No.: 900-ITP-A4-RE-0001.	
Note 7: ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLANGES	SHALL BE AS PER ISO STANDARD.	
Note 8: SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIRED FOR MAINTANANCE PERIOD.	OR PRE-COMMISIONNING,COMMISIONING,START-UP	AND
Note 9: NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST 1 MI	ETER LESS THAN NPSHA.	
lote 10: DESIGN TEMPRATURE RANGE IS: -10 /100 °C.		
lote 11: ESTIMATED SHUT-OFF PRESSURE IS 5.52 BARA.		
Note 12 Ex-group: ExdIIBT4		
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PROJECT: PP- PE PILOT PLANT	client:	STORES
TITLE: DATA SHEET FOR JACKET RWA PUMP (R261) (P-023)	نیمی نیمی	شرکت ملی صنایع پتروشیه شرکت پژوهش و فناوری پترود
DATA SHEET FOR	S JACKET RWA	
PUMP (R261		
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PROJEC1	Г: PP- I	PE PIL	OT PL	ANT							client:								2	
TITLE: D	LE: DATA SHEET FOR JACKET RWA PUMP (R261) (P-023)										کت ملی صنایع پتروشیمی ب پژوهش و فناوری پتروشیمی									
REV.	0	1	2	3	4	5	PAGE	0	1	2	3	4	5	REV.	0	1	2	3	4	5
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B 1	X																			
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Rev	Date Prepareed By				C	hecked				Ap	proved b	у		Status						
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						Docui	ment No.	.: 000-E	AS-A4-	RE-0003	3						Rev.:	0		
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ΤI	TLE: DATA	SHEET FOR JAC	KET RWA P	PUMP (R261) (P-023)		شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی								
				CENTRIF	UGAL	PUMP	DATA S	HEET,	SI	UNIT				
	APPLICABLE FOR	E TO: PROPO	SAL O	PURCHASE &T	AS B	UILT UNIT				SERVICES	(00	0)		Rev
	SITE	NPC R8	T CENTRE	SREVICE		JA	CK			R261) (P-023)				
4	No. of Req'd:	: 1 Service												
5	NOTES: INF	FORMATION BELOW	TO BE COMP	PLETED O BY PUR	CHASER		BY MANUFA	ACTURER			BYI	MANUFACTURE	ER OR PURCHASER	
6				DATA SHE	ETS							RE	VISIONS	
7		ITEM NO.	ATTACHED	ITEM NO.	ATT	ACHED	ITEI	M NO.		ATTACHED	NO.	DATE	BY	
8	PUMP	P-023			(	$\circ$				0	1			
9	MOTOR	PM-023			- (	$\circ$				0	2			
#	GEAR		0		(	$\circ$				0	3			
#	TURBINE		0		(	$\circ$				0	4			
#	APPLICABLE	E OVERLAY STANDA	RD(S): ISO	STANDARD							5			
#		OPERATIN	NG CONDIT	IONS (5.1.3)						LIQUID (	5.1.	3)		
#	FLOW, NOR	RMAL 25	(m³/h) RA1	ED <b>27.5</b>	(m <sup>3</sup> /h)	LIQUID T	YPE OR NA	AME		WATER	+ 2	0% GLYCOLE		
#	OTHER		(Note	e 11)		● HAZA	ARDOUS	0		FLAMMABLE		TOXIC	(5.1.5)	
#	SUCTION PR	RESSURE MAX / RAT	TED 10.8	1 / 2.5	(bara	)				MIN.		NORMAL	MAX.	
#	DISCHARGE	PRESSURE		4.6	(bara	PUMPING	3 TEMP (°C	()		10		25	55	
#	DIFFERENTI	IAL PRESSURE		2.1	(bar)	VAPOUR	PRESS . (b	oara)		0.012		0.031	0.154	
#	DIFF. HEAD	20.0	(m) NPSHA	>10 (Note 9)	(m)	RELATIV	E DENSITY	(SG):		1.01		1.03	1.04	
#	PROCESS V	/ARIATIONS (5.1.4)				VISCOSI	TY (cP)			1.93		1.38	0.78	
		CONDITIONS (5.1.4)	~~~~~~~~~~~~~	SED DELIVERY VALV	/E		CHEAT, C	· ·			2.36		(kj/kg .k.)	***********
	_	● CONT ○ INT		(STARTS/DAY)		_	ORIDE CON		TIOIT			N/A	(mg/kg)	-
#	○ PARALL	EL OPERATION REC				_	CONCENTE			N/A (mo			ET (5.12.1.12c)	
#		-	TE DATA (5.	1.3)		CORROS	SIVE / EROS	SIVE AGE			N/A		(5.12.1.9)	
	LOCATION:	`	_	_						MATERIALS	(5.1			
#	_	_	_	OR UNHEATED		_	EX H CLAS			**********		S-5 (Note 5)		***********
#	•	RICAL AREA CLASSIF				_	DESIGN ME						(°C)	
#	CL		C,T4 DIV			REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)  BARREL / CASE  C.S  IMPELLER  C.S								
#	-	RIZATION REQ D.	TROPIC	ALIZATION REQ D.						*******	ELLI		C.S	
	SITE DATA (						E / IMPELLE	R WEAR	RIN		_	C.S		
#	_	DE <b>1889</b> (m)			(mbar)	SHAI	*********			C.:	S			
#	Ξ.	OF AMBIENT TEMPS		-28 / 44		☐ DIFF	USERS			DEDEODA	/ A NI	CE		_
#	-	VE HUMIDITY:MIN / N		/ 86	(%)			<u> </u>		PERFORM	IAN	CE	( ( ) )	
		CONDITIONS: (5.1.30)	CORR	DUST FUMES		_	AL CURVE	energen en e					(r/min)	
#	OTHER_		CORR	JOIVE		IMPELLER DIA RATED   MAX.   MIN   MIN						(mm)		
#		_ г	ORIVER TYP	)F									************	
#	INDUCT		STEAM TUR			☐ NATED POWER (kw) EFFICIENCY (%) ☐ MINIMUM CONTINUOUS FLOW:								
#	OTHER	_	(Not	_		_	MOM COM	1110003		2	ABLE		(m <sup>3</sup> /h)	
#	OTTILL		(1101				ERRED O	PER. REG			,DLL	TO	(m³/h)	
#		MOTOR	DRIVER (6.	1.1 / 6.1.4)			WABLE OF					TO	(m³/h)	
#	MANUFA					. —	. HEAD @ F					-	(m)	
#			)		(r/min)		. POWER @						(kw)	
	FRAME	,	ENCLOS	SURE	•		HR AT RAT						(m) (5.1.10)	
		NTAL VERTIC		SERVICE FACTOR			SUCTION			EED :	13	000 M3/Hr,M,F	WINDOWS .	
	_	PHASE / HERTZ	400 /	3 / 5	50	MAX	. SOUND P	RESS LEV	/EL	REQ. D		85	(dba) (5.1.16)	
#	TYPE	**************************************	ASYNCHE	RONOUS		EST MAX. SOUND PRESS LEVEL (dba) (5.1.16)							(dba) (5.1.16)	
#	O MINIMUN	M STARTING VOLTA	GE (6.1.5)			EST	MAX. SOUN						(dba) (5.1.16)	
	INSULAT	***************************************	TEMP. RISE						UTI	LITY CONDI	TIOI	NS (5.1.3)		
	FULL LC					ELECTRI	CITY		VOL	TAGE		PHASE	HERTZ	_
#		ROTOR AMPS				DRIV	ERS		4	100		3	50	
#	_	NG METHOD		D.O.L		HEA <sup>-</sup>								
#	LUBE					SYS1	TEM VOLTA	GE DIP		○80%	6	OTHER	(6.1.5)	
		(TYPE / NUMBER) :				STEAM		X. PRESS.		MAX. TEM	P	MIN. PRESS.	MIN. TEMP	
#	RADIAL		1			DRIVERS	-						1	_
#	THRUST				***********	HEATING		, <u> </u>						**********
#	VERTICAL THRUST CAPACITY						3 WATER:	(5.1.19)		SOURCE			/00	
#							TEMP.					ETURN TEMP.	(°C)	
#							RESS.					I PRESS.	(bar)	
#							. PRESS.	NTDATION	al r	(bar) MA	A. Al	LLOW. D.P.	(bar)	
#						CHLORIE	DE CONCE	NIKAIIO	N :				(mg/kg)	****************
				Document No	o.: 000-l	DAS-A	1-RE-00	03					Rev.: 0	
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PROJECT: PP- PE PILOT PLANT	Client:
TITLE: DATA SHEET FOR JACKET RWA PUMP (R261) (P-023)	شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

				CENT	DIELICAL DUM	DATA SHEET SHINIT		
_			CONSTRUCT		RIFUGAL PUIVI	DATA SHEET, SI UNIT	RATION AND PAIN	T Pov
7	POTATION: (V/IF	EWED FROM COU			cw ccw	MANUFACTURER'S STANDARD		SEE BELOW Rev
	PUMP TYPE : (4.		FLING END)	Ь	CW LCCW	SPECIFICATION NO.	900-SPC-A4-PD-0	AND
4			ОН6	OTHER		PUMP:		
5	CASING MOUNT	ING :				PRIMER		
6	CENTERLIN	E 🖸	IN-LINE	OTHER		FINISH COAT		
7						BASEPLATE : (6.3.1.7)		
8	CASING TYPE :	_				PRIMER		
9	I —	_	MULTIPLE VOL	UTE	DIFFUSER	FINISH COAT	***************************************	
	CASE PRESSUR					DETAILS OF LIFTING DEVICES	(6.3.20)	
11		SUCTION REGION		OR MAWP (5.3.		SHIPMENT: (7.4.1)	A EVDODE DOVIN	0.05011050
12 13	@	VABLE WORKING 100	(°C)	****	(Dar	<ul><li>DOMESTIC</li><li>EXPORT</li><li>OUTDOOR STORAGE MORE THAN</li></ul>	EXPORT BOXIN	G REQUIRED
14		T PRESSURE	( 0)	1.5 x M	AWP (har	SPARE ROTOR ASSEMBLY PACKAGED		
15	I=	NNECTIONS : (5.4	1.2) (1	lote 7)	(our	HORIZONTAL STORAGE	O VERTICAL STOR	RAGE
16		SIZE	FLANGE	FACG	POSITION	O TYPE OF SHIPPING PREPARATION	0.2	
17			RATING				ND COOLING	
18	SUCTION	2 1/2"	150#	RF		HEATING JACKET REQ D. (5.8.9)		
19	DISCHARGE	2"	150#	RF		COOLING REQ D.		
20			_	· <u> </u>		COOLING WATER PIPING PLAN (6.5	5.3.1)	
21	PRESSURE	CASING AUX. CO			<del></del>	C.W. PIPING:		***************************************
22			NO.	SIZE (DN)	TYPE	PIPE TUBING:	FITTINGS	
23	DRAIN			1/2"	VALVED	C.W. PIPING MATERIALS:		
24	VENT			1/2"	VALVED	S.STEEL C.STEEL	GALVANIZE	:D
25 26	WARM-UP					COOLING WATER REQUIREMENTS :  BEARING HOUSING		(m³/h)
27	MACHINED	AND STUDDED C	ONNECTIONS	(5 4 3 8)		HEAT EXCHANGER		(m³/h)
28		AL THREADS REQ				TOTAL COOLING WATER		(m³/h)
	ROTOR:					HEAT MEDIUM: O STEAM	OTHER	
30	l <u> </u>	IT BALANCE TO IS	SO 1940 G 1.0 (	5.9.4.4)		HEATING PIPING : O TUBING	O PIPE	
	COUPLINGS :(6.						LUBRICATION	
32	MANUFACT	URER		MODEL		BEARING (TYPE / NUMBER ) (5.10.1) :		
33	RATING (kw	per100 r/min)	***************************************	***************************************		RADIAL	1	
34		-	(mm)	SERVIC	E FACT.	THRUS1	/	
35	_	BALANCED TO IS				LUBRICATION (5.11.3,5.11.4):		
36	_	WITH PROPRIETA		DEVICE (6.2.1	.1)	GREASE O		
37 38	_	PER ISO 14691 (6. PER ISO 14691 (6				PURGE OIL MIST PURE  CONSTANT LEVEL OILER PREFERE		
39	I <u>~</u>		10441 (0.2.4)	O ASME B	151	OIL VISC. ISO GRADE	_INOL (3.10.2.2) .	
40	l I	COUPLING GUA	RD (6.2.14C)	O . 101112 D			IENTATION	***************************************
41	COUPLING	GUARD STANDAR	RD PER		(6.2.14a)	ACCELEROMETER (6.4.2.1)		Managara and a same
	BASEPLATES:					O PROVISION FOR MOUNTING ONLY	(5.10.2.11)	
43	API BASEPL	ATE NUMBER	100000000000000000000000000000000000000		(ANNEX D)	FLAT SURFACE REQ D (5.10.2.12)		
44	O NON-GROU	T CONSTRUCTIO	N (6.3.13)			TEMP GAUGES (WITH THERMO WE	ELLS) (8.1.3.6)	
	OTHER				***************************************	PRESSURE GAUGE TYPE		
	MECHANICAL SI		(Note	4 & 5)				
47	CATEGORY	-			***************************************	DEMARKS		
48	ARRENGME TYPE	:NI		************************************		REMARKS:		
49 50	PLAN			01	***************************************	Па	SSES	
51	LAN	-		VI		MASS OF PUMP (kg)		AND CONTROL OF CONTROL
52						MASS OF BASEPLATE (kg)		
53						MASS OF DRIVER (kg)		***************************************
54						TOTAL MASS (kg)		
55						, and an		
56								
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			Own	er Job No	.:			Type:DAS

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PROJECT: PP- PE PILOT PLANT	Client:	
TITLE: DATA SHEET FOR JACKET RWA PUMP (R261) (P-023)	شرکت ملی صنایع پتروشیمی	

CENTRIFUGAL PUMP DATA SHEET, SI UNIT											
1	SPARE PARTS (TABLE 18)		QA INSPECTION A	ND TESTING (	CONT.)		Rev.				
2	START-UP ONORMAL MAINTENANCE		TEST	NON-WIT	WIT	OBSERVE					
3	OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	0	•	0					
4	OTHER PURCHASER REQUIREMENTS		PERFORMANCE (7.3.3)	$\circ$		$\circ$					
5	COORDINATION MEETING REQUIRED (9.1.3)		O RETEST ON SEAL	0	$\circ$	$\circ$					
6	MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)								
7	O MAX RELATIVE DENSITY		NPSH (7.3.4.2)			0					
8	MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCITY	$\bigcirc$	$\circ$	0					
9	O OPERATION TO TRIP SPEED		DATA (7.3.3.4D)								
10	OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.3)	$\sim$	$\circ$	0					
11	CONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	$\leq$		0					
12 13	TORSIONAL ANALYSIS REQUIRED (5.9.2.1)  TORSIONAL ANALYSIS REPORT (5.9.2.6)		CLEANLINESS PRIOR TO		$\circ$	O					
14	PROGRESS REPORTS (9.3.3)		FINAL ASSEMBLY (7.2.2.2)  NOZZLE LOAD TEST (6.3.6)		$\circ$	0					
15	OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	$\sim$	$\sim$	$\sim$					
16	ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f)		MOUNTING PAD SURFACE (6.3.3)		0	0					
17	PIPING AND APPURTENANCES		MECHANICAL RUN UNIT OIL		$\bigcirc$	0	*************				
	MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		TEMP P. STABLE (7.3.4.7.1)		0	O					
19	VENT DRAIN COOLING WATER		4 HR. MECHANICAL RUN AFTER		$\circ$	0					
20	MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)			Ŭ					
21	FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)		4 HR. MECH. RUN TEST (7.3.4.7.2)			0					
22	INSTALLATION LIST IN PROPOSAL (9.2.3L)		BRG HSG RESONANCE		Ŏ	Õ					
23	CONNECTION BOLTING		TEST (7.3.4.6)								
24	OPTFE COATING ASTM A153 GALVANIZED		O AUXILIARY EQUIPMENT		$\circ$	$\circ$					
25	O PAINTED SS		TEST (7.3.4.5)								
26	QA INSPECTION AND TESTING		IMPACT TESTING (5.12.4.3)		$\circ$	$\circ$					
27	SHOP INSPECTION (7.1.4) (Note 6)		O PER EN 13445	_							
28	PERFORMANCE CURVE APPROVAL		O PER ASME V III		_	-					
29	TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		O		$\circ$	0					
30	MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT REC								
31	CASING IMPELLER SHAFT		VENDOR SUBMIT TEST PROCEDURE								
32	OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL	ALPARIS	O VENDOR SUBMIT TEST DATA WITHIN O INCLUDE PLOTTED VIBRATION SPEC		3.3E)						
33 34	CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)		SUBMIT INSPECTION CHECK LIST (7.								
35	MAG PARTICLE LIQUID PENETRANT		30BWIT INSPECTION CHECK LIST (7.	1.0)							
36	RADIOGRAPHIC ULTRA SONIC										
37	INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)										
38	MAG PARTICLE LIQUID PENETRANT										
39	RADIOGRAPHIC ULTRA SONIC										
40	HARDNESS TEST REQUIRED : (7.2.2.3	2.3)									
41	O ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3										
42	FOR										
43	METHOD										
44							_				
45	RE	REMARKS									
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		client:	4		
PROJECT: PP- PE PILOT PLANT		2826			
TITLE: DATA SHEET FOR JACKET RWA PUM	P (R261) (P-023)		شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی		
Note 1: ALL ELECTRICAL MOTORS SHALL BE IN A	CCORDANCE WITH "TECHNIC	CAL SPECIFICATION FOR LV MOTOR" DOC.No.			
900-SPC-A4-EE-0005 MOTOR ENCLOSUR	RES SHALL BE OF TOTALLY EN	CLOSED FAN-COOLED (TEFC)			
Note 2: TYPE OF PROTECTION SHALL BE Aexd.					
Note 3: DRY, FLEXIBLE , MULTI DISK ,S.S MEMBF	RANE SPACER TYPE COUPLING	G SHALL BE USED.			
DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR.					
Note 4: MECHANICAL SEAL SHALL BE AS PER API DATA SHEET FOR MECHANICAL SEALS.	682 / ISO 21049 3rd EDITIO	N :2004. VENDOR SHALL FILL OUT API 682 (3rd ED.)			
Note 5: VENDOR IS REQUIRED TO REVIEW AND	CONFIRM.				
Note 6: REFERE TO "INSPECTION & TEST PLAN F	OR CENTRIFUGAL PROCESS P	UMPS" DOC.No.: 900-ITP-A4-RE-0001.			
Note 7: ALLOWABLE LOAD AND MOMENTS ON	NOZZLES AND FLANGES SHAL	L BE AS PER ISO STANDARD.			
	'ENDOR IF REQUIRED FOR PR	E-COMMISIONNING,COMMISIONING,START-UP AND			
MAINTENANCE PERIOD.  Note 9: NPSH REQUIRED FOR SELECTED PUMP S	HALL RE AT LEAST 1 METER L	FSS THAN NPSHA			
Note 10: DESIGN TEMPRATURE RANGE IS: -10 /10					
Note 11: ESTIMATED SHUT-OFF PRESSURE IS 5.52					
Note 12 Ex-group: ExdIIBT4	DONA.				
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O	wner Job No.:		Type:DAS		

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	client:	
PROJECT: PP PILOT PLANT		<b>₹</b>
TITLE: DATA SHEET FOR PROPANE CONDENSED PUMP (P-361)	یمی روشیمی	سر کت ملی صنایع پتروس شر کت پژوهش و فناوری پتر
DATA SHEET FOR PR PUMP		Rev.: 0
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TITLE: DATA SHEET FOR PROPANE CONDENSED PUMP (P-361)



REV.	0	1	2	3	4	5	REV.	0	1	2	3	4	5	REV.	0	1	2	3	4	5
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Rev.			ate			Prep	ared By			Che	cked	Ву		Α	pprov	ed By	,		tatus	

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ΓLE: DAT <i>i</i> 1)	A SHEET FOR PROP	ANE CONDEN	SED PUMP (P-						وری پتروشیمی	شرکت پژوهش و فنا
		(	ENTRIFUGAL PL	JMP DATA	SHEET	, SI UNIT				
APPLICABLE	TO: PROPOSAL	O PU	RCHASE	AS BU	ILT					
FOR		NPC R&T		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	UNIT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	300	***************	
SITE		&T CENTRE - AR			SREVICE		PROPANE CO	OND	ENSED PUMP	•
No. of Req'd:	1 Service : 1	/ Stand by	_				-			
IOTES : INFO	DRMATION BELOW TO BE CO	OMPLETED	O BY PURCHAS	SER	LB/	/ MANUFACTU	RER D B	Y MAI		OR PURCHASER
			ATA SHEETS						REVIS	
	ITEM NO.	ATTACHED	ITEM NO.	ATT	ACHED	ITEM NO.	ATTACHED	_	DATE	BY
PUMP	P-361				$\frac{0}{0}$		${}$	1		
MOTOR	PM-361				$\stackrel{\circ}{\sim}$		0	2		
GEAR					$\frac{\circ}{}$		$+\stackrel{\circ}{\succ}$	3		
TURBINE	0.455.4.4.4.5.5.5.4.5.4.5.4.5.4.5.4.5.4.				0			4		
APPLICABLE	OVERLAY STANDARD(S):	ING CONDITIONS	(10TH EDITION)				LIQUID (	5		
LOW NORM		(m³/h) RATED	3.3	(m <sup>3</sup> /h)	LIQUID TV	DE OD NAME	LIQUID (			
LOW, NORM OTHER	TAL 3	(III/II) RAIED	3.3	(111 /11)	HAZAF	PE OR NAME	FLAMMABL	ALALALALALALA	Propane TOXIC	(F 1 F)
	ESSURE MAX / RATED	28	/ 19	(bara)	TIAZAI	NDO03	MIN.		NORMAL	(5.1.5) MAX.
DISCHARGE			2 (Note 3)	(bara)	PUMPING '	TEMP (°C)	IVIIIN.		30-40	IVIDA.
	AL PRESSURE		3	(bara) (bar)		RESS . (bara)			19	+
DIFF. HEAD		(m) NPSHA	<del>-</del>	(m)		DENSITY (SG):			0.485	+
	RIATIONS (5.1.4)	(, IN OHA	3 (11016 3)	(111)	VISCOSITY	, ,			0.063 at 40 °C	c
	ONDITIONS (5.1.4)	CLO	SED DELIVERY VALV	'E	SPECIFIC I	. ,		2.	85	(kj/kg .k.)
		INTERMITTENT (STA				,	TRATION (6.5.2.			(mg/kg)
_	EL OPERATION REQ'D (5.1.1;		,		_		N <b>N/A</b> (mo			
Ŭ		ITE DATA (5.1.3)			<del>-</del> -	/E / EROSIVE A			•	(5.12.1.9)
LOCATION: (5	5.1.30)						MATERIALS	(5.1	2.1.1)	
_	OHEATED	OUTDOOR	UNHEATED		ANNE	X H CLASS (5.1:	2.1.1)		A-7 (Note 5)	1
	ICAL AREA CLASSIFICATION		• • • • • • • • • • • • • • • • • • • •				TEMP (5.12.4.1)			(°C)
_	I GR	C,T4 DIV	2(Note 2)		_		S MATERIALS F			
	IZATION REQ D.	○ TROPICALIZ	**************		1 —	EL / CASE				S.S.
SITE DATA (5		O			_		AR RINGS			
	E 1889	(m) BAROMETE	R <b>810</b>	(mbar)	SHAFT		URLANDA MARIA	******		
_	OF AMBIENT TEMPS:MIN,MAX		28 / 44	(°C)	DIFFU			******		
Ξ	E HUMIDITY:MIN / MAX		/ 86	(%)			PERFORM	/IAN	CE	
UNUSUAL CO	ONDITIONS: (5.1.30)	● DU	ST FUMES		PROPOSA	L CURVE NO.			П	(r/min)
OTHER		CORROSIV	E		☐ IMPEL	LER DIA RATE	O MA	XX.	MIN	(mm)
_					IMPEL	LER TYPE		C	CLOSE	
		DRIVER TYPE			RATE	POWER	VTA (kw	v) EFF	FICIENCY	(%)
INDUCTION	ON MOTOR	STEAM TURBINI	GEAR		MINIM	UM CONTINUO	US FLOW:		**************************	
OTHER		(Note 1)			THERI	MAL	(m³/h) ST.	ABLE		(m³/h)
						ERRED OPER. F		******	то	(m³/h)
	MOTOF	R DRIVER (6.1.1 / 6	5.1.4)			VABLE OPER. F		******	то	(m³/h)
MANUFA					_	HEAD @ RATED				(m)
<u>•</u>	VTA	(kw)		(r/min)		POWER @ RAT				(kw)
FRAME		ENCLOSUR				R AT RATED FL				(m) (5.1.10)
_	NTAL VERTICAL		RVICE FACTOR	***************************************			FIC SPEED :	DESCRIPTION OF THE PARTY OF THE	000 M3/Hr,M,I	
_	PHASE / HERTZ		***********	60			LEVEL REQ. D		85	(dba) (5.1.16)
TYPE		ASYNCHRON	OUS			AX. SOUND PR				(dba) (5.1.16)
	STARTING VOLTAGE (6.1.5	-		**********************	EST M	AX. SOUND PO				(dba) (5.1.16)
INSULAT		TEMP. RISE					Y CONDITION	S (5.	<del> </del>	
FULL LO.					ELECTRIC	<b>—</b>	VOLTAGE		PHASE	HERTZ
_	ROTOR AMPS				DRIVE	<u> </u>	400		3	50
STARTIN	IG METHOD		D.O.L		HEATI		ID .		0.5711	
LUBE						M VOLTAGE D			OTHER	(6.1.5)
	YPE / NUMBER) :				STEAM	MAX. PRES	S. MAX. TEN	MP	MIN. PRESS.	MIN. TEMP
RADIAL		I		***************************************	DRIVERS	-				+
THRUST	***********************************	I			HEATING	L	0) 001151	25		1
	L THRUST CAPACITY	DOI:11		(81)		WATER: (5.1.1	0		TUDE TO S	(°C)
UP	(N)	DOWN		(N)	SUPPLY TE	***********	and a second		ETURN TEMP.	
					NORM. PR				N PRESS.	(bar)
						PRESS. CONCENTRAT		нλ. Α	LLOW. D.P.	(bar)
					OLILORIDE	OUNCENTRA	ION.			(mg/kg)
				Docum	ent No.:3	00-DAS-A4	I-RE-0033			Rev.: 0
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PROJECT: PP PILOT PLANT	Client:	<u>**</u>
TITLE: DATA SHEET FOR PROPANE CONDENSED PUMP (P-361)		شر کت ملی صنایع پتروشیمی شر کت پژوهش و فناوری پتروشیمی

			CENTRIF	UGAL PUMP D	ATA	SHEET, SI UNIT	
		CONSTR	UCTION			SURFACE PREPARATION AND PAINT	
ROTATION : (VIE	EWED FROM C	OUPLING END)		□ cw □ cc	w		E BELOW
PUMP TYPE : (4.	.1) API610					SPECIFICATION NO. 900-SPC-A4-PD-0002	2
	онз	он6 ОТ	HER			PUMP:	
CASING MOUNT		_				PRIMER	
CENTERLIN	IE 🔲 IN-LIN	NE OT	HER			FINISH COAT	
						BASEPLATE: (6.3.1.7)	
CASING TYPE :						PRIMER	
SINGLE VOL	_	TIPLE VOLUTE		DIFFUSER		FINISH COAT	
CASE PRESSUR						DETAILS OF LIFTING DEVICES (6.3.20)	
MAX. ALLOV		ION DESIGNED FO	R MAWP (5.3.6)		(bar)	SHIPMENT: (7.4.1)  DOMESTIC EXPORT EXPORT BOXING R	DECLUBED
@		(°C)			(Dai)	OUTDOOR STORAGE MORE THAN 6 MONTHS	REQUIRED
HYDRO TES		( 0)	1.5 x MAW	D	(har)	SPARE ROTOR ASSEMBLY PACKAGED FOR:	
NOZZLE CO		(5.4.2) (Note			(Dai)	HORIZONTAL STORAGE VERTICAL STORAGE	3E
NOZZEE OC	SIZE	FLANGE	FACG	POSITION	T	O TYPE OF SHIPPING PREPARATION	J_
	OIZL	RATING	17.00	roomon		HEATING AND COOLING	
SUCTION	2"	300#	RF		+	HEATING JACKET REQ D. (5.8.9)	
DISCHARGE	1"	300#	RF		†	COOLING REQ D. (5.8.9)	
00. I/ II (OL	<u> </u>	300#	151		7	COOLING WATER PIPING PLAN (6.5.3.1)	
PRESSURE	CASING ALIX	CONNECTIONS : (5	(43)			C.W. PIPING:	
	0,10111071071	NO.	SIZE (DN)	TYPE	1	PIPE TUBING: FITTINGS	
DRAIN			1/2"	VALVED	1	C.W. PIPING MATERIALS:	enchenomenenenenenenenenenenenenenene
VENT			1/2"	VALVED	1	S.STEEL C.STEEL GALVANIZED	
WARM-UP					1	COOLING WATER REQUIREMENTS :	
				•	-	BEARING HOUSING	(m <sup>3</sup> /h)
MACHINED	AND STUDDED	CONNECTIONS :	(5.4.3.8)			HEAT EXCHANGER	(m <sup>3</sup> /h)
○ CYLINDRIC	AL THREADS R	REQUIRED (5.4.3.3)				TOTAL COOLING WATER	(m <sup>3</sup> /h)
ROTOR:						HEAT MEDIUM: STEAM OTHER	
COMPONEN	NT BALANCE TO	O ISO 1940 G 1.0 (5	.9.4.4)			HEATING PIPING: O TUBING O PIPE	
COUPLINGS :(6.	.2.2) (Note	e 11)				BEARING AND LUBRICATION	
MANUFACT	URER	VTA MC	DDEL	SPACER(Type T	SK)	BEARING (TYPE / NUMBER ) (5.10.1):	
RATING (kw			VTA			RADIAL /	
SPACER LE			SERVICE FACTOR			THRUST /	
~		ISO 1940-1 G 6.3 (				LUBRICATION (5.11.3,5.11.4) :	
~		ETARY CLAMPING I	DEVICE (6.2.1.1)			GREASE OIL	
COUPLING						PURGE OIL MIST PURE OIL MIST	
COUPLING		_				CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):	
COUPLING	PER API 671 (6	5.2.4)	ASME B151			OIL VISC. ISO GRADE	
		UARD (6.2.14C)				INSTRUMENTATION	
COUPLING	GUARD STANE	DARD PER		(6.2	2.14a)	ACCELEROMETER (6.4.2.1)	
BASEPLATES:						PROVISION FOR MOUNTING ONLY (5.10.2.11)	
API BASEPL				(ANNEX D)		FLAT SURFACE REQ D (5.10.2.12)	
NON-GROU	IT CONSTRUCT	TION (6.3.13)				TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)	
OTHER	EAL (= 0 ::	/A1 / * * * =				PRESSURE GAUGE TYPE	
MECHANICAL SI		(Note 4 & 5	•				
CATEGORY			<b>2</b> 3		***	DEMADKS -	
ARRENGME TYPE			J			REMARKS:	
PLAN	100000000000000000000000000000000000000		52		***	MASSES	
Auxiliary Equip	ment:		(Note 13)		-	MASS OF PUMP (kg)	
ur y =quipi			(			MASS OF FOWE (kg)  MASS OF BASEPLATE (kg)	
						MASS OF DRIVER (kg)	
						TOTAL MASS (kg)	
				Document No.	: 300	-DAS-A4-RE-0033 R	ev. 0
				Owner Job No	.:	т	ype: DAS

۱۱۱: پرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

#### TITLE: DATA SHEET FOR PROPANE CONDENSED PUMP (P-361)

CENT	CIFUGAL PUMP DA	ATA SHEET, SI UNIT			
SPARE PARTS (TABLE 18)		QA INSPECTION AN	ND TESTING	(CONT.)	
START-UP ONORMAL MAINTENANCE		TEST	NON-WIT	WIT	OBSERVE
OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	0		$\circ$
OTHER PURCHASER REQUIREMENT	rs	PERFORMANCE (7.3.3)	$\circ$		$\circ$
COORDINATION MEETING REQUIRED (9.1.3)		O RETEST ON SEAL	0	$\circ$	$\circ$
MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)			
MAX RELATIVE DENSITY		NPSH (7.3.4.2)	0		$\circ$
MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCITY	0	$\circ$	$\circ$
OPERATION TO TRIP SPEED		DATA (7.3.3.4D)			
OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.3)	0	$\circ$	$\circ$
CONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	0		$\circ$
TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		$\circ$	0
TORSIONAL ANALYSIS REPORT (5.9.2.6)		FINAL ASSEMBLY (7.2.2.2)			
PROGRESS REPORTS (9.3.3)		NOZZLE LOAD TEST (6.3.6)	0	0	0
OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	Õ	Õ	Õ
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1)	f)	MOUNTING PAD SURFACE (6.3.3)	•	•	•
PIPING AND APPURTENANCES	<i>'</i>	O MECHANICAL RUN UNIT OIL	0	0	$\circ$
NIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		TEMP P. STABLE (7.3.4.7.1)	Ü	•	Ü
VENT DRAIN COOLING WATER		4 HR. MECHANICAL RUN AFTER	0	$\circ$	0
MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)	0	$\circ$	$\mathcal{L}$
FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2	0)	4 HR. MECH. RUN TEST (7.3.4.7.2)	0		0
	.0)		Ô	Ō	$\sim$
INSTALLATION LIST IN PROPOSAL (9.2.3L)		BRG HSG RESONANCE	U	$\cup$	$\cup$
NNECTION BOLTING  OPTE COATING  OSTM A153 GALVANIZED		TEST (7.3.4.6)	0		$\overline{}$
		AUXILIARY EQUIPMENT	O	$\circ$	0
QA INSPECTION AND TESTING		TEST (7.3.4.5)	0		
		IMPACT TESTING (5.12.4.3)	0	$\circ$	$\circ$
SHOP INSPECTION (7.1.4) (Note 6)		O PER EN 13445	····		
PERFORMANCE CURVE APPROVAL		O PER ASME V III		_	_
TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		Q	_ O	$\circ$	$\circ$
MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT RE	CORDS (7.2.1.	1C)	
CASING IMPELLER S	HAFT	VENDOR SUBMIT TEST PROCEDUR	RES (7.3.1.2 / 9	.2.5)	
OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, I	MECH. SEAL PARTS	VENDOR SUBMIT TEST DATA WITH	IN 24 HOURS (	(7.3.3.3E)	
CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)		O INCLUDE PLOTTED VIBRATION SPE	ECTRA (5 A		
INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e	e)	<ul> <li>SUBMIT INSPECTION CHECK LIST (</li> </ul>	7.1.6)		
MAG PARTICLE LIQUID PENETRANT					
RADIOGRAPHIC ULTRA SONIC					
INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)					
MAG PARTICLE LIQUID PENETRANT					
RADIOGRAPHIC ULTRA SONIC					
) HARDNESS TEST REQUIRED :	(7.2.2.3)				
) ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3	10. A A A A A A A A A A A A A A A A A A A				
FOR					
METHOD					
	REMAR	KS			
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	Owner Job No.:			Туре	: DAS
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Note 1:	61)	ىر كت ملى صنايع پتروشيمى ت پژوهش و فناورى پتروشيمى
	ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH	H "TECHNICAL SPECIFICATION FOR LV
	MOTOR" DOC.No.900-SPC-A4-EE-0005 MOTOR ENCLOSUR (TEFC)	RES SHALL BE OF TOTALLY ENCLOSED FAN-C
Note 2:	TYPE OF PROTECTION SHALL BE Aexd	
Note 3:	ESTIMATED SHUT-OFF PRESSURE IS 26.4 BARA.	
Note 4:	MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 682 (3rd ED.) DATA SHEET FOR MECHANICAL SEALS.	3rd EDITION :2004. VENDOR SHALL FILL OU
Note 5:	VENDOR IS REQUIRED TO REVIEW AND CONFIRM.	
Note 6:	REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL	PROCESS PUMPS"
	DOC.No.: 900-ITP-A4-RE-0001.	
Note 7:	ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLA	NGES SHALL BE AS PER API 610 (10TH ED.)
Note 8:	SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIF COMMISIONNING, COMMISIONING, START-UP AND	RED FOR PRE-
	MAINTANANCE PERIOD.	
Note 9:	NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST	T1 METER LESS THAN NPSHA.
Note 10:	DESIGN TEMPRATURE RANGE IS: -45 /100 °C. Also desig	n pressure is: 35 Barg.
Note 11:	DRY, FLEXIBLE , MULTI DISK ,S.S MEMBRANE SPACER TYPE	COUPLING SHALL BE USED.
	DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP IN	MFR.
Note 12:	REFERE TO "UTILITY CONDITION" DOC.No.: 900-SPC-A4-PF	R-0006.
Note 13:	IN PUMP SEAL POT SHALL BE INSTALLED TWO LEVEL SWIT	TCHES AND A PRESSURE TRANSMITTER
	TO CHECK OIL LEVEL AND PRESSURE; both instruments sh	all be supplied by
	Vendor and they shall be transmitted to DCS (item LSL360	06, LSH3605, PT-3607)

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	Document No : 300-DAS-A4-RE-0033	Rev. 0

PROJECT: PP PILOT PLANT	client:	*
TITLE: DATA SHEET FOR FRESH HEXANE PUMP (P-343)	نیچی روشیمی	شرکت ملی صنایع پترون شرکت پژوهش و فناوری پت
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PROJE						НЕХ	ANE PU	MP (P	-343)		client					ی	تروشیمی ن پتروشیم	ف ن صنایع پ ن و فناوری	ک شرکت ملو کت پژوهش	m
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#### TITLE: DATA SHEET FOR FRESH HEXANE PUMP (P-343)

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VOLTS / PHASE / HERTZ

INSULATION

LUBE

RADIAL THRUST

FULL LOAD AMPS

LOCKED ROTOR AMPS STARTING METHOD

BEARINGS (TYPE / NUMBER) :

VERTICAL THRUST CAPACITY

(N)

MINIMUM STARTING VOLTAGE (6.1.5)

**ASYNCHRONOUS** 

TEMP. RISE

DOWN

#### **CENTRIFUGAL PUMP DATA SHEET, SI UNIT** APPLICABLE TO: O PURCHASE AS BUILT Rev PROPOSAL FOR NPC R&T UNIT 300 HEXANE FRESH PUMP SITE NPC R&T CENTRE - ARAK - IRAN SREVICE Service : 1 / Stand by .... No. of Reg'd: 1 NOTES: INFORMATION BELOW TO BE COMPLETED O BY PURCHASER BY MANUFACTURER BY MANUFACTURER OR PURCHASER DATA SHEETS REVISIONS ITEM NO. ATTACHED ATTACHED ITEM NO. ATTACHED NO. P-343 PUMP 1 MOTOR PM-343 2 Ó Õ GEAR 3 0 TURBINE 4 APPLICABLE OVERLAY STANDARD(S): API 610 (10TH EDITION) **OPERATING CONDITIONS (5.1.3)** LIQUID (5.1.3) FLOW, NORMAL 5 (m<sup>3</sup>/h) RATED $(m^3/h)$ LIQUID TYPE OR NAME OPERATING TEMP. DENSITY @ OP. TEMP. **660** (Kg/m3) HAZARDOUS INFLAMMABLE TOXIC 16 VISCOSITY @ OP. TEMP. 0.3 (cp) Max. viscosity at min. temp. 0.6 (cp) Vapour pressure at op. Temp. 18 SUCTION PRESSURE MAX / NORMAL MIN. NORMAL MAX. 19 DISCHARGE PRESSURE 4.3 PUMPING TEMP (°C) 30-40 (bara) DIFFERENTIAL PRESSURE 0.41 3.2 VAPOUR PRESS . (bara) (bar) DIFF. HEAD 50.0 (m) NPSHA @ Q rated 10 (Note 9) RELATIVE DENSITY (SG): 0.66 VISCOSITY (cP) 0.3 at AMB MAX. HEAD @ Q=0 (m) PROCESS VARIATIONS (5.1.4) STARTING CONDITIONS (5.1.4) CLOSED DELIVERY VALVE SPECIFIC HEAT Co 2.17 (kj/kg .k.) SOLIDS: NO () YES Pressure at suction vessel 1.1 (bara) SERVICE: CONT CHLORIDE CONCENTRATION (6.5.2.4) INTERMITTENT (STARTS/DAY) (mg/kg) PARALLEL OPERATION REQ'D (5.1.13) H<sub>2</sub>S CONCENTRATION **N/A** (molfraction) WET (5.12.1.12c) SITE DATA (5.1.3) CORROSIVE / EROSIVE AGENT N/A (5.12.1.9)MATERIALS (5.12.1.1) LOCATION: (5.1.30) OINDOOR OHEATED OUTDOOR UNHEATED ANNEX H CLASS (5.12.1.1) A-7 (Note 5) ELECTRICAL AREA CLASSIFICATION (5.1.24 / 6.1.4) Exia IIB T4 MIN DESIGN METAL TEMP (5.12.4.1) CL I GR C,T4 DIV REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12) BARREL / CASE S.S. IMPELLER WINTERIZATION REQ D. TROPICALIZATION REQ D. SITE DATA (5.1.30) CASE / IMPELLER WEAR RINGS ALTITUDE 1889 BAROMETER 810 SHAFT (mbar) RANGE OF AMBIENT TEMPS:MIN,MAX. (°C) DIFFUSERS PERFORMANCE RELATIVE HUMIDITY:MIN / MAX (%) UNUSUAL CONDITIONS: (5.1.30) DUST FUMES PROPOSAL CURVE NO. OTHER CORROSIVE IMPELLER DIA RATED (mm) IMPELLER TYPE CLOSE DRIVER TYPE RATED POWER VTA (kw) EFFICIENCY STEAM TURBINE GEAR MINIMUM CONTINUOUS FLOW: INDUCTION MOTOR (m³/h) STABLE $(m^3/h)$ (Note 1) THERMAL (m<sup>3</sup>/h) PREFERRED OPER. REGION TO MOTOR DRIVER (6.1.1 / 6.1.4) (m<sup>3</sup>/h) ALLOWABLE OPER. REGION MANUFACTURER MAX. HEAD @ RATED IMPELLER (m) MAX. POWER @ RATED IMPELLER VTA 48 (kw) (r/min) (kw) FRAME ENCLOSURE NPSHR AT RATED FLOW (m) (5.1.10) SERVICE FACTOR / 3 / HORIZONTAL VERTICAL MAX SUCTION SPECIFIC SPEED : 13000 M3/Hr,M,RPM (5.1.11)

		1	UTILITY CONDITIONS (5.1.3) (Note 11)									
		ELECTRICIT	Υ	VC	LTAGE	PHASE	HERTZ					
		DRIVER	RS		400	3	50					
D.O.L		HEATIN	IG									
		SYSTEM	VOLTA	GE DIP	O 80%	OTHER	(6.1.5)					
		STEAM	MAX. F	RESS.	MAX. TEM	IP MIN. PRES	SS. MIN. TEMP					
		DRIVERS										
		HEATING										
		COOLING W	/ATER: (	5.1.19)	SOURC	Ε						
	(N)	SUPPLY TEN	MP.		(°C) MAX	K. RETURN TEMI	P. ( <sup>o</sup> C)					
	Docu	ment No.:	ent No.:									
	Owne	er Job No.:					Type: DA					
							Page 1 of					

MAX . SOUND PRESS LEVEL REQ. D.

EST MAX. SOUND PRESS LEVEL

EST MAX. SOUND POWER LEVEL

(dba) (5.1.16)

(dba) (5.1.16)

(dba) (5.1.16)

Client:	4
	2820
	شركت ملى صنايع پتروشيمي
	شرکت پژوهش و فناوری پتروشیمی

TITLE: DATA SHEET FOR FRESH HEXANE PUMP (P-343)

PROJECT: PP PILOT PLANT

				CENTRIF	FUGAL PUMP D	ATA	SHEET, SI UNIT	
			CONS	STRUCTION			SURFACE PREPARATION AND PAI	NT Rev
2 3 4	ROTATION : (VIE DESIGN TEMP.: PUMP TYPE : (4.1 OH2 CASING MOUNTI	-30/+180 1) API610 OH3	(°C) DES	GIGN PRESS.: 10 (barg)	□ cw □ cc	CW	MANUFACTURER'S STANDARD OTHER  SPECIFICATION NO. 900-SPC-A4-PD-( PUMP: PRIMER	SEE BELOW
	CENTERLINE			OTHER			FINISH COAT  BASEPLATE: (6.3.1.7)	
9 10	CASING TYPE : SINGLE VOL CASE PRESSURI	E RATING :			DIFFUSER		PRIMER     FINISH COAT     DETAILS OF LIFTING DEVICES (6.3.20)	
11 12 13 14		/ABLE WORKIN		FOR MAWP (5.3.6)  1.5 x MAW	'D	(bar)	SHIPMENT: (7.4.1)  DOMESTIC EXPORT EXPORT BOXIN  OUTDOOR STORAGE MORE THAN 6 MONTHS  SPARE ROTOR ASSEMBLY PACKAGED FOR:	IG REQUIRED
15 16	I=	NNECTIONS : (5	.4.2) (No	ote 7)	POSITION	(bar)	O TYPE OF SHIPPING PREPARATION  HEATING AND COOLING	RAGE
19	SUCTION DISCHARGE	3" 2"	150# 150#	RF RF		1	HEATING JACKET REQ D. (5.8.9) COOLING REQ D.	
20 21 22		CASING AUX. C	ONNECTIONS NO.	SIZE (DN)	TYPE	]	C.W. PIPING:  TUBING:  TUBING:  FITTINGS	
23 24 25	DRAIN VENT WARM-UP			1/2" 1/2"	VALVED VALVED		C.W. PIPING MATERIALS:  S.STEEL C.STEEL GALVANIZE COOLING WATER REQUIREMENTS:	ED (m³/h)
	MACHINED A  CYLINDRICA  ROTOR:						BEARING HOUSING HEAT EXCHANGER TOTAL COOLING WATER HEAT MEDIUM: STEAM OTHER	(m³/h) (m³/h)
	COMPONEN COUPLINGS :(6.2	2.2) (Note	10)	0 (5.9.4.4) MODEL	SPACER(Type T	SK)	HEATING PIPING: O TUBING PIPE  BEARING AND LUBRICATION  BEARING (TYPE / NUMBER) (5.10.1):	
33 34 35 36 37 38	SPACER LEN COUPLING V COUPLING V COUPLING F	NGTH BALANCED TO IS WITH PROPRIET PER ISO 14691 (	SO 1940-1 G 6 ARY CLAMPII 6.2.4)	VTA ) SERVICE FACTOR 6.3 (6.2.3) NG DEVICE (6.2.1.1)			RADIAL / THRUS' / LUBRICATION (5.11.3,5.11.4): GREASE OIL O PURGE OIL MIST O PURE OIL MIST CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):	
39 40	COUPLING F		.4)	ASME B151			OIL VISC. ISO GRADE  INSTRUMENTATION	
43 44 45	COUPLING OBASEPLATES: API BASEPLATE NON-GROUT OTHER	ATE NUMBER	ON (6.3.13)		(ANNEX D)	.2.14a)	□ ACCELEROMETER (6.4.2.1)     ○ PROVISION FOR MOUNTING ONLY (5.10.2.11)     □ FLAT SURFACE REQ D (5.10.2.12)     ○ TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)     ○ PRESSURE GAUGE TYPE	
47	ARRENGME		(Note 4	& 5) 2 3			REMARKS:	
50 51 52 53 54 55		nent:		52 (Note 3)			MASS OF PUMP (kg)  MASS OF BASEPLATE (kg)  MASS OF DRIVER (kg)  TOTAL MASS (kg)	
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TITLE: DATA SHEET FOR FRESH HEXANE PUMP (P-343)



CEN	TRIFUGAL PUMP DATA	A SHEET, SI UNIT				
SPARE PARTS (TABLE 18)		QA INSPECTION AN	ID TESTING (C	ONT.)		Rev
2 START-UP ONORMAL MAINTENANCE		TEST	NON-WIT	WIT C	BSERVE	
OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	O O	•	Õ	
4 OTHER PURCHASER REQUIREME		PERFORMANCE (7.3.3)	0		0	
COORDINATION MEETING REQUIRED (9.1.3)	O	RETEST ON SEAL	0	0	$\circ$	
6 MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)				
7 OMAX RELATIVE DENSITY		NPSH (7.3.4.2)	0		0	
8		TRUE PEAK VELOCITY  DATA (7.3.3.4D)	0	$\circ$	$\circ$	
		, ,	0	0	$\bigcirc$	
10 OH3 BEARING HS6 LIFTER (8.1.2.6) 11 CONNECTION DESIGN APPROVAL (5.12.3.4)		COMPLETE UNIT TEST (7.3.4.3)  SOUND LEVEL TEST (7.3.4.4)	0		0	(00000000000000000000000000000000000000
12 TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		Ö	$\tilde{O}$	
13 O TORSIONAL ANALYSIS REPORT (5.9.2.6)	_	FINAL ASSEMBLY (7.2.2.2)		$\circ$	0	
14 PROGRESS REPORTS (9.3.3)		NOZZLE LOAD TEST (6.3.6)	0	0	0	
15 OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	Ŏ	$\tilde{\bigcirc}$	$\tilde{\circ}$	
16 ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.		MOUNTING PAD SURFACE (6.3.3)	O	$\circ$	0	
17 PIPING AND APPURTENANCES		MECHANICAL RUN UNIT OIL	0	0	0	
18 MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)	Ŭ	TEMP P. STABLE (7.3.4.7.1)	Ü		•	
19 VENT DRAIN COOLING WATER		4 HR. MECHANICAL RUN AFTER	0	0	0	
20 MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)	-	_	~	(mananananananananananananananananananan
21 FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5)	5.2.8)	4 HR. MECH. RUN TEST (7.3.4.7.2)	0		0	Samononon
22 INSTALLATION LIST IN PROPOSAL (9.2.3L)	lČ	BRG HSG RESONANCE	Ö	0	Ō	
23 CONNECTION BOLTING		TEST (7.3.4.6)				
24 O PTFE COATING ASTM A153 GALVANIZED	C	AUXILIARY EQUIPMENT	0	$\circ$	$\circ$	
25 O PAINTED SS		TEST (7.3.4.5)				
QA INSPECTION AND TESTING		IMPACT TESTING (5.12.4.3)	0	0	$\circ$	(on an our our our our our
27 SHOP INSPECTION (7.1.4) (Note 6)		O PER EN 13445				
28 PERFORMANCE CURVE APPROVAL		O PER ASME V III				annonenenen
29 TEST WITH SUBSTITUTE SEAL (7.3.3.2B)	Ō		. 0	$\supset$	$\circ$	
30 MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT RE	CORDS (7.2.1.1C)			
31 CASING IMPELLER	SHAFT	VENDOR SUBMIT TEST PROCEDUR	ES (7.3.1.2 / 9.2.5	5)		
32 OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS			•	.3.3E)		
33 CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5						
34 INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3	.4e)	SUBMIT INSPECTION CHECK LIST (	7.1.6)			
35 MAG PARTICLE LIQUID PENETRANT						
36 RADIOGRAPHIC ULTRA SONIC						annonenenen
INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)						-
38 MAG PARTICLE LIQUID PENETRANT 39 RADIOGRAPHIC ULTRA SONIC						
39 RADIOGRAPHIC ULTRA SONIC 40 HARDNESS TEST REQUIRED :	(7.2.2.3)					
41 O ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3	(1.2.2.0)					
42 FOR						
43 METHOD						
44						*********
45	REMARKS					
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PROJECT: PP- PE PILOT PLANT  TITLE: DATA SHEET FOR STEAMER SCRUBBER (P-611)		client: شیمی تروشیمی	سوکت ملی صنایع پترو شرکت ملی صنایع پترو شرکت پژوهش و فناوری پ
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			Page A

PROJE	CT: F	PP- PI	E PILO	OT PL	ANT						client:							OV.	2		
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## TITLE: DATA SHEET FOR STEAMER SCRUBBER

	MP										ری پتروشیمی	وهش و فناو	شركتٌ پژر	
(P	-611)		CE	NTRIFUGAL	DIIMI	D DATA G	LEET	SI IINI	IT					
1	APPLICABL	E TO: PROPO			AS BUI		DHEET	, SI UN						Rev
2	FOR		NPC R&T			UNIT			60	00			<del></del>	
3	SITE		CENTRE - ARA			SREVICE		STE	AMER SO	RUI	BBER PUM	Р		
4	No. of Req'd		e: 1 / Stand by	$\overline{}$										
	NOTES : INF	ORMATION BELOV	V TO BE COMPLI			<u> В Шву</u>	MANUFA	CTURER	<u></u> BY	MAN	UFACTUREF		CHASER	
6 7		ITEM NO.	ATTACHED	DATA SHEET ITEM NO.	_	ACHED	ITEM N	O IA-	TTACHED	NO	DATE	SIONS B'	<i>,</i>	
8	PUMP	P-611	ATTACHED	ITEMINO.	ATTA	)	I I E IVI IN	O. A	O	1 1	DATE	ь	T	
9	MOTOR	PM-611	101		$\vdash$	5			ŏ	2				
10	GEAR		Ŏ		$\vdash$	5			Ŏ	3				
11	TURBINE		Ŏ						Ō	4				
12	APPLICABL	OVERLAY STAND	ARD(S): ISO ST	ΓANDARD						5				
13		OPERATING			10.				LIQUID (5					
	FLOW, NOR OTHER	MAL 15	_(m³/h) RATE	16.5 (m <sup>3</sup>	/n)	LIQUID TYP			LAMMABL		r + Polyme		1.5)	
		RESSURE MAX / RA	TED <b>7.5</b>	/ 1.5	(bara)	OHAZAK	D003		MIN.		NORMAL		л.5) ЛАХ.	
		PRESSURE	3.5 (N			PUMPING T	EMF( <sup>∪</sup> C)	⊢			60			
		IAL PRESSURE	2		(bar)	VAPOUR P	,	′ –			0.2			
19	DIFF. HEAD		(m) NPSHA	>10 (Note 9)	(m)	RELATIVE I		(SG):		_	0.98		4	
20 21		'ARIATIONS (5.1.4) CONDITIONS (5.1.4)	CLOSED	FI IVERY VAI V	/F	VISCOSITY SPECIFIC F	, ,	L		4.3	0.46 at 60		<b>1</b> /kg .k.)	
		CONDITIONS (5.1.4)				● CHLOR			ION (6.5.2		N/A		g/kg)	
23		EL OPERATION RE				H <sub>2</sub> S CO						NET (5.12		
24		SITE	<b>DATA</b> (5.1.3)			CORROSIV	E / EROS			N/A		(5.	12.1.9)	
	LOCATION:	(5.1.30) R	OUTDOOR			ANNEX			ERIALS		2.1.1) S-4 (Note :	E\		
26 27		RICAL AREA CLASS			,	MIN DE					-10	3)	(°C)	
28	CL		C,T4 DIV	2(Note 2)							D. (5.12.1.12	2)	_` '	
29	_	RIZATION REQ D.	TROPICAL	IZATION REQ D.		BARRE				PELLI	ER	C.S.		
30	SITE DATA		) DADOMET	ED 940 (	I\	CASE /		R WEAR F	RINGS		C.S			
31 32	ALTITUI	DE <u>1889</u> (m OF AMBIENT TEMP	,			SHAFT								
33		/E HUMIDITY:MIN /				1 100	LIKO	PI	ERFORM	ANC	E			
34	UNUSUAL C	ONDITIONS: (5.1.30			- ' '	PROPOSAL	. CURVE I	NO.				(r/ı	min)	
35	OTHER		CORROSIVE			☐ IMPELL			MA	-	MIN		(mm)	
36 37		DE DE	RIVER TYPE			IMPELL RATED	_		(hw		LOSE FICIEN(		(%)	
38	INDUCT	ION MOTOR	STEAM TURBII	NE () GEAR		MINIMU	-		`	, _,	IOILIV.		_('')	
39	OTHER		(Note 1)	0		THERM			n³/h) ST/	ABLI		(m	<sup>3</sup> /h)	
40						PREFE					TO		<sup>3</sup> /h)	
41	TOTAL A A A A A A A A A A A A A A A A A A		RIVER (6.1.1 /	6.1.4)		ALLOW					TO	(m	<sup>3</sup> /h)	
42 43	MANUF		v)	(r/m	nin)	MAX. H							(m) (kw)	
	FRAME				,	NPSHR	_					(m (5.	` ′	
		NTAL VERTI	CAL SE	ERVICE FACTOR		MAX SU	JCTION S	PECIFIC S			00 M3/Hr,M	<b>,RPM</b> (5.	1.11)	
46		PHASE / HERTZ		3 / 50		MAX . S					85		(5.1.16)	
47 40	TYPE		ASYNCHRONO	Uð		EST MA							(5.1.16)	
48 49	_	M STARTING VOLTA	` ′			EST MA				(5.	1.3) (Note 1		(5.1.16)	
50	FULL LO					ELECTRICI <sup>*</sup>		VOLT	1	•	PHASE	HEF	RTZ	
51		ROTOR AMPS				DRIVER		40			3	50		
52	-	NG METHOD	D	.O.L		HEATIN	IG							
53	LUBE					SYSTE	M VOLTA	GE DIP	O 809	6	OOTHER	(6.	1.5)	
54		TYPE / NUMBER) :				STEAM	MAX. P	RESS.	MAX. TEM	1P	MIN. PRES	S. MIN	. TEMP	
55 56	RADIAL THRUS		1			DRIVERS HEATING				$\dashv$		-		
57		AL THRUST CAPAC	CITY			COOLING V	VATER:	(5.1.19)	SOURC	E I				
58		(N)		(N)		SUPPLY TE				_	ETURN TEMP	P	(°C)	
59		<del></del>				NORM. PRE			,		N PRESS.		(bar)	
60						MIN. RET. F		`	,	AX. A	LLOW. D.P.		(bar)	
61 62						CHLORIDE	CONCEN	IKATION	•			(m	g/kg)	
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# TITLE: DATA SHEET FOR STEAMER SCRUBBER PUMP (P-611)

			CENTRI	FUGAL PUN	IP D	ATA SHEET, SI UNIT					
1		CONSTRUCT				SURFACE PREPARATION AND PAINT	Rev				
2 ROTATION : (VIE	EWED FROM CO	OUPLING END)		cw Cc	N						
3 PUMP TYPE : (4	,					SPECIFICATION NO. 900-SPC-A4-PD-0002					
4 OH1	ОН3	OH6	OTHER			PUMP:					
5 CASING MOUNT	TING:					PRIMER					
6 CENTERLIN	IE 🔲 IN-L	INE	OTHER			FINISH COAT	-				
7						BASEPLATE: (6.3.1.7)	-				
8 CASING TYPE :			_			PRIMER					
9 SINGLE VO		LTIPLE VOLUTI	E 📙	DIFFUSER		FINISH COAT					
10 CASE PRESSUF						DETAILS OF LIFTING DEVICES (6.3.20					
1_	SUCTION REGI			(5.3.6)		SHIPMENT: (7.4.1)	-				
	WABLE WORKIN				(bar)						
13 @		(°C)	4 - **			OUTDOOR STORAGE MORE THAN 6 MONTHS					
	ST PRESSURE	- (A)	1.5 x MA	WP	(bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR:					
I —	NNECTIONS : (	· ·	ote 7)		1	O HORIZONTAL STORAGE OVERTICAL STORAGE					
16	SIZE	FLANGE RATING	FACG	POSITION		TYPE OF SHIPPING PREPARATION  HEATING AND COOLING	<del>- - </del>				
17	1 1/2"		RF		ł		-				
18 SUCTION 19 DISCHARGE	1 1/2"	150# 150#	RF		1	HEATING JACKET REQ D. (5.8.9)	$\vdash$				
20		130#	IXF	1	J	COOLING REQ D.  COOLING WATER PIPING PLAN (6.5.3.					
	CASING AUX. O	CONNECTIONS	: (5.4.3)			C.W. PIPING:					
22		NO.	SIZE (DN)	TYPE	1	PIPE TUBING: FITTINGS					
23 DRAIN			1/2"	VALVED	1	C.W. PIPING MATERIALS:	-				
24 VENT			1/2"	VALVED	1	S.STEEL C.STEEL GALVANIZED					
25 WARM-UP					1	COOLING WATER REQUIREMENTS :					
26						☐ BEARING HOUSIN (m³/h)					
27 MACHINED	AND STUDDED	CONNECTION	S: (5.4.3.8)			HEAT EXCHANGEI (m³/h)					
28 CYLINDRIC	AL THREADS RE	EQUIRED (5.4.3	3.3)			TOTAL COOLING WATER (m <sup>3</sup> /h)					
29 ROTOR :						HEAT MEDIUM: OSTEAM OTHER					
30 COMPONEN	NT BALANCE TO	ISO 1940 G 1.	0 (5.9.4.4)			HEATING PIPING : OTUBING OPIPE					
31 COUPLINGS :(6.	.2.2) <b>(N</b> c	ote 11)				BEARING AND LUBRICATION					
32 MANUFACT		VTA	MODEL SI	PACER(Type TS	SK)	BEARING (TYPE / NUMBER ) (5.10.1):					
33 RATING (kw		VT		÷		RADIAL /					
34 SPACER LE		VTA (mm)		E FACTOR		THRUST/					
1 =	BALANCED TO		. ,			LUBRICATION (5.11.3,5.11.4):					
36 COUPLING			NG DEVICE (6	3.2.1.1)		GREASE					
37 COUPLING		,				O PURGE OIL MIST OPURE OIL MIST					
38 COUPLING			O 40005 =	454		CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):  OIL VISC. ISO GRADE					
39 COUPLING			O ASME B	Tol		INSTRUMENTATION					
_	K COUPLING GU GUARD STAND			(e ?	.14a)	ACCELEROMETER (6.4.2.1)	+				
42 BASEPLATES:	COMIND O I MIND	, IND I LIV		(0.2	ı <del></del> a)	PROVISION FOR MOUNTING ONLY (5.10.2.11)					
I	_ATE NUMBER			(ANNEX D)		FLAT SURFACE REQ D (5.10.2.12)	H				
44 O NON-GROU		ION (6.3.13)				TEMP GAUGES (WITH THERMO WELLS) (8.1.3.	H				
45 OTHER		, · · · · · · · · · · · · · · · · · · ·				PRESSURE GAUGE TYPE					
46 MECHANICAL S	EAL: (5.8.1)	(Note 4 &	<b>§</b> 5)		<del></del>						
47 CATEGORY		•	2								
48 ARRENGME	ENT		1		-	REMARKS:					
49 TYPE			Α		-						
50 PLAN			31		_	MASSES					
51						MASS OF PUMP (kg)	-				
52						MASS OF BASEPLATE (kg	-				
53 54						MASS OF DRIVER (kg) TOTAL MASS (kg)	-				
-				Do	cun	nent No.: 600-DAS-A4-RE-0044 Rev.: 00	1				
				Ov	vner	Job No.: Type: DA	AS				
						Page 2 o	of 4				

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### TITLE: DATA SHEET FOR STEAMER SCRUBBER PUMP (P-611)



CENTRIFUGAL	DIIMD DATA	CHEET	CLUMIT
CENTRIFUGAL	PUNIP DATA	SHEET.	OI UNII

CENTRIFUGAL PUMP DATA SHEET, SI UNIT											
SPARE PARTS (TABLE 18)		QA INSPECTION AND T	ESTING (CONT	Г.)	Rev.						
2 START-UP NORMAL MAINTENANCE		TEST N	ION-WIT WIT	OBSERVE							
OTHERS 2 YEARS OF OPERATION LIST (Note 8)		HYDROSTATIC (7.3.2)	$\circ$	$\circ$							
4 OTHER PURCHASER REQUIREMENTS		PERFORMANCE (7.3.3)	$\circ$	$\circ$							
5 COORDINATION MEETING REQUIRED (9.1.3)		RETEST ON SEAL	0 0	$\circ$							
6 MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)									
7 OMAX RELATIVE DENSITY		NPSH (7.3.4.2)	0	$\circ$							
8 O MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCITY	0 0	$\circ$							
9 OPERATION TO TRIP SPEED		DATA (7.3.3.4D)									
10 OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.3)	0 0	$\circ$							
11 CONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	$\circ$	$\circ$							
12 TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		$\circ$							
13 O TORSIONAL ANALYSIS REPORT (5.9.2.6)		FINAL ASSEMBLY (7.2.2.2)									
14 PROGRESS REPORTS (9.3.3)		NOZZLE LOAD TEST (6.3.6)	0 0	$\circ$							
15 OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		CHECK FOR CO-PLANNER	0 0	$\circ$							
16 ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f)		MOUNTING PAD SURFACE (6.3.3)									
17 PIPING AND APPURTENANCES		MECHANICAL RUN UNIT OIL	0 0	$\circ$							
18 MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		TEMP P. STABLE (7.3.4.7.1)									
19 VENT DRAIN COOLING WATER		4 HR. MECHANICAL RUN AFTER	0 0	$\circ$							
20 MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)		OIL TEMP STABLE (7.3.4.7.3)									
21 FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)		4 HR. MECH. RUN TEST (7.3.4.7.2)		$\circ$							
22 NSTALLATION LIST IN PROPOSAL (9.2.3L)		BRG HSG RESONANCE	0 0	$\circ$							
23 CONNECTION BOLTING		TEST (7.3.4.6)									
24 O PTFE COATING ASTM A153 GALVANIZED		AUXILIARY EQUIPMENT	0 0	$\circ$							
25 O PAINTED SS		TEST (7.3.4.5)									
QA INSPECTION AND TESTING		IMPACT TESTING (5.12.4.3)	0 0	$\circ$							
27 SHOP INSPECTION (7.1.4) (Note 6)		O PER EN 13445									
28 O PERFORMANCE CURVE APPROVAL		O PER ASME VI									
29 TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		<u> </u>	0 0	$\circ$							
30 MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND HT R	RECORDS (7.2.1.1	C)							
31 CASING IMPELLER SHAFT		VENDOR SUBMIT TEST PROCEDU	JRES (7.3.1.2 / 9.2	2.5)							
32 OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH.		VENDOR SUBMIT TEST DATA WIT	THIN 24 HOURS (	7.3.3.3E)							
33 CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)		INCLUDE PLOTTED VIBRATION SI	PECT A								
34 INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)		SUBMIT INSPECTION CHECK LIST	Γ (7.1.6)								
35 MAG PARTICLE LIQUID PENETRANT											
36 RADIOGRAPHIC ULTRA SONIC											
37 INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)											
38 MAG PARTICLE LIQUID PENETRANT											
39 RADIOGRAPHIC ULTRA SONIC	1										
40 HARDNESS TEST REQUIRED :(7	7.2.2.3)										
41 ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3											
42 FOR											
43 METHOD											
44											
45	REMARKS										
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				Page 3 of	4						





Note 1: ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH "TECHNICAL SPECIFICATION FOR LV MOTOR" DOC.No.900-SPC-A4-EE-0005 MOTOR ENCLOSURES SHALL BE OF TOTALLY ENCLOSED FAN-COOLED (TEFC)

Note 2: TYPE OF PROTECTION SHALL BE Aexd

Note 3: ESTIMATED SHUT-OFF PRESSURE IS 4.2 BARA.

Note 4: MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 3rd EDITION :2004. VENDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEET FOR MECHANICAL SEALS.

Note 5: VENDOR IS REQUIRED TO REVIEW AND CONFIRM.

Note 6: REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC.No.: 900-ITP-A4-RE-0001.

Note 7: ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLANGES SHALL BE AS PER ISO STANDARD.

Note 8: SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIRED FOR PRE-COMMISIONNING, COMMISIONING, START-UP AND MAINTANANCE PERIOD.

Note 9: NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST 1 METER LESS THAN NPSHA.

Note 10: DESIGN TEMPRATURE RANGE IS: -10 /150 °C. Also design pressure is: 10 Barg.

Note 11: DRY, FLEXIBLE , MULTI DISK ,S.S MEMBRANE SPACER TYPE COUPLING SHALL BE USED.

DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR.

note 12: Ex-group : ExdIIBT4

Note 13: REFERE TO "UTILITY CONDITION" DOC.No.: 900-SPC-A4-PR-0006.

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		Page 4 of 4

PROJECT: PP- PE PILOT PLANT		client:	<u>*</u>
TITLE: DATA SHEET FOR DRYER SCRUBBER PL	JMP (P-621)	ىع پتروشيمى اورى پتروشيمى	شر کت ملی صنا <sub>:</sub> شر کت پژوهش و فن
	IEET FOR DRYE JBBER PUMP (P-621)		Rev.: 0
	Owner Job No.:		Type: DAS

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TITLE: DATA SHEET FOR DRYER SCRUBBER PUMP (P-621)

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TITLE: DATA SHEET FOR DRYER SCRUBBER PUMP شرکت پژوهش و فناوری پتروشیم (P-621) CENTRIFUGAL PUMP DATA SHEET, SI UNIT 1 APPLICABLE TO: PROPOSAL PURCHASE AS BUILT
2 FOR NPC R&T UNI Rev DRYER SCRUBBER PUMP NOTES : INFORMATION BELOW TO BE COMPLETED BY PURCHASER BY MANUFACTURER BY MANUFACTURER OR PURCHASER

DATA SHEETS REVISIONS ATTACHED ATTACHED ATTACHED NO ITEM NO. P-621 8 PUMP 9 MOTOR PM-621 10 GEAR 11 TURBINE 5 OPERATING CONDITIONS (5.1.3) LIQUID (5.1.3) 14 FLOW, NORMAL **15** (m³/h) RATED **16.5** (m³/h) LIQUID TYPE OR NAME Water + Polymer FLAMMABLE TOXIC NORMAL 15 OTHER HAZARDOUS 16 SUCTION PRESSURE MAX / RATED 7 / (bara) PUMPING TEMP (<sup>o</sup>C) VAPOUR PRESS . (bara) RELATIVE DENSITY (SG): 0.65 at 40 C VISCOSITY (cP) SPECIFIC HEAT, C<sub>P</sub> (kj/kg .k.) 22 SERVICE: CONT INTERMITTENT (STARTS/DAY) ■ CHLORIDE CONCENTRATION (6.5.2.4) (mg/kg) H<sub>2</sub>S CONCENTRATION **N/A** (molfraction) WET (5.12.1.12c) 23 PARALLEL OPERATION REQ'D (5.1.13) SITE DATA (5.1.3) CORROSIVE / EROSIVE AGENT N/A MATERIALS (5.12.1.1)

ANNEX H CLASS (5.12.1.1)

MIN DESIGN METAL TEMP (5.12.4.1)

PER LICED LARROUSE AND A CONTROL OF THE PRODUCT OF THE PROD 25 LOCATION: (5.1.30) 26 INDOOR OHEATED OUTDOOR OUNHEATED 27 ELECTRICAL AREA CLASSIFICATION (5.1.24 / 6.1.4) REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)

BARREL / CASE C.S. IMPELLER

CASE / IMPELLER WEAR RINGS

C.S. 28 CL I GR C,T4 DIV 2(Note 2)
29 WINTERIZATION REQ D. TROPICALIZATION REQ D. 30 SITE DATA (5.1.30)
31 ALTITUDE 1889 (m) BAROMETER 810
32 RANGE OF AMBIENT TEMPS:MIN,MAX. -28 / 44
86
FUMES SHAFT (mbar) DIFFUSERS
PERFORMANCE PROPOSAL CURVE NO. MAX. MIN

IMPELLER DIA RATED MAX. MIN

IMPELLER TYPE CLOSE

IMPELLER TYPE (kw) EFFICIENCY 36 DRIVER TYPE 38 INDUCTION MOTOR STEAM TURBINE GEAR 39 OTHER (Note 1) 40 MOTOR DRIVER (6.1.1 / 6.1.4) 42 MANUFACTURER
43 VTA (kw) ENCLOSURE
44 FRAME ENCLOSURE
45 HORIZONTAL EVERTICAL SERVICE FACTOR
46 VOLTS / PHASE / HERTZ 400 / 3 /
47 TYPE ASYNCHRONOUS MAX. POWER @ RATED IMPELLER

NPSHR AT RATED FLOW (m) (5.1.10) MAX SUCTION SPECIFIC SPEED: 13000 M3/Hr,M,RPM (5.1.11) MAX . SOUND PRESS LEVEL REQ. D 85 (dba) (5.1.16) EST MAX. SOUND PRESS LEVEL \_\_(dba) (5.1.16) 48 MINIMUM STARTING VOLTAGE (6.1.5) EST MAX. SOUND POWER LEVEL (dba) (5.1.16) 49 NSULATION TEMP. RISE
50 FULL LOAD AMPS HERTZ 51 CLOCKED ROTOR AMPS

51 CLOCKED ROTOR AMPS

D.O.L ELECTRICITY DRIVERS HEATING 53 LUBE SYSTEM VOLTAGE DIP 80% OTHER MAX. PRESS. MAX. TEMP MIN. PRESS. MIN. TEMP 54 BEARINGS (TYPE / NUMBER) : STEAM 55 RADIAL /
56 THRUST /
57 VERTICAL THRUST CAPACITY DRIVERS HEATING COOLING WATER: (5.1.19) SOURCE SUPPLY TEMP. (°C) MAX. RETURN TEMP.
NORM. PRESS. (bar) DESIGN PRESS.
MIN. RET. PRESS. (bar) MAX. ALLOW. D.P. UP \_\_\_\_\_(N) DOWN \_\_\_\_\_(N) 58 59 \_\_\_ (bar) 60 (bar) CHLORIDE CONCENTRATION: 61 (mg/kg) Document No.: 600-DAS-A4-RE-0046 Rev.: 0 Owner Job No.: Type: DAS

TITLE: DATA SHEET FOR DRYER SCRUBBER PUMP



client:

#### TILE: DATA SHEET FOR DRYER SCRUBBER PUMP (P-621)

CONSTRUCTION   SUPERATION AND PAINT   Rev   2   2017ADM   (PREVED FROM COUPLING FIRE)   COW	(1 -021)							
CONTROL NORMOED FROM COURT MIGETAND   COV   CO					RIFUGAL PI	JMP		
Purple   1/4	1		CONSTRUC	TION			SURFACE PREPARATION AND PAINT	Rev
SAMING MOUNTNOTE:	2 ROTATION : (VIEW	ED FROM C	COUPLING EN	(D)	cw     \cc'	Ν		
CASNIG TYPE:	3 PUMP TYPE : (4.1)	ISO STA	NDARD				SPECIFICATION NO. 900-SPC-A4-PD-0002	
CONTRIUNE	4 OH1 O	DH3	OH6	OTHER			PUMP:	
BASEFLATE: (8.3.17)		G :					PRIMER	
CASE PRESSURE VOLUTE	6 CENTERLINE	☐ IN-L	INE	OTHER			FINISH COAT	
SINCLE YOLUTE   MULTIPLE YOLUTE   DIFFUSER	7						BASEPLATE : (6.3.1.7)	
	8 CASING TYPE :						PRIMER	
10	9 SINGLE VOLU	TE MUL	TIPLE VOLUT	E 🗌	DIFFUSER		FINISH COAT	
12	10 CASE PRESSURE	RATING:					DETAILS OF LIFTING DEVICES (6.3.20)	
150	11 OH6 PUMP SU	ICTION REG	SION DESIGNE	ED FOR MAW	P (5.3.6)		SHIPMENT: (7.4.1)	
14	12 MAX. ALLOWA	ABLE WORK	ING PRESSU	RE		(bar)	O DOMESTIC EXPORT EXPORT BOXING REQUIRED	
NOZZEC CONNECTIONS : (5.4.2)   Note 6	13 @ <b>1</b>	50	(°C)				OUTDOOR STORAGE MORE THAN 6 MONTHS	
Size   FLANCE   FACG   POSITION	14 HYDRO TEST	PRESSURE		1.5 x MA	WP	(bar)	SPARE ROTOR ASSEMBLY PACKAGED FOR :	
RATING   11/2"   150#   RF	15 NOZZLE CON	NECTIONS :	(5.4.2) <b>(N</b>	lote 6)		-	O HORIZONTAL STORAGE	
11/2"   150# RF	16	SIZE	FLANGE	FACG	POSITION	1	TYPE OF SHIPPING PREPARATION	
19 DISCHARGE 1" 150# RF	17		RATING				HEATING AND COOLING	
COULING WATER PIPING PLAN (6.5.3.1)   C.W. PIPING:   C.W. PIPING: MATERIALS:   C.W. PIPING:	18 SUCTION	1 1/2"	150#	RF		1	HEATING JACKET REQ D. (5.8.9)	
PRESSURE CASING AUX CONNECTIONS : (5.4.3)	19 DISCHARGE	1"	150#	RF				
DRAIN   1/2"   VALVED   1/2"	20			•		•	COOLING WATER PIPING PLAN (6.5.3.1)	
No.   SIZE (DN)   TYPE	21 PRESSURE CA	ASING AUX.	CONNECTIO	NS : (5.4.3)			C.W. PIPING:	
Vent				1	TYPE	1	<u> </u>	
Vent	23 DRAIN	l		1/2"	VALVED	1	C.W. PIPING MATERIALS:	
COOLING WATER REQUIREMENTS :	24 VENT	l		1/2"	VALVED	1	S.STEEL CSTEEL GALVANIZED	
BEARING HOUSING	25 WARM-UP	l		Ì		1		
CYLINDRICAL THREADS REQUIRED (5.4.3.3)								
22 ROTOR:  30 © COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)  31 COUPLINGS :(6.2.2) (Note 10)  32 MANUFACTURER  33 VITALING (kw per 100 r/min)  34 SPACER LENGTH  35 VITALING (kw per 100 r/min)  36 COUPLING BALANCE TO ISO 1940-1 G 6.3 (6.2.3)  37 COUPLING PER ISO 19691 (6.2.4)  38 COUPLING PER ISO 19691 (6.2.4)  39 © COUPLING PER ISO 19691 (6.2.4)  30 © COUPLING PER ISO 19691 (6.2.4)  30 © COUPLING GUARD G CALON (6.2.4)  31 API BASEPLATE NUMBER  32 (COUPLING GUARD STANDARD  33 API BASEPLATE NUMBER  34 (ANNEX D)  45 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  46 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  47 VITALING (ANNEX D)  48 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  49 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  40 MASS OF DUMP (kg)  40 MASS OF DUMP (kg)  41 MASS OF DUMP (kg)  42 MASS OF DUMP (kg)  43 MASS OF DAS-A4-RE-0046  44 MASS (kg)  45 DOcument Not.: 600-DAS-A4-RE-0046  46 Nover Job Not.:  47 DOCUMENT NOTE OF TOTAL MASS (kg)  48 DOCUMENT NOTE OF TOTAL MASS (kg)  49 DOCUMENT NOTE OF TOTAL MASS (kg)  40 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  42 DOCUMENT NOTE OF TOTAL MASS (kg)  43 DATE OF THE TOTAL MASS (kg)  44 DOCUMENT NOTE OF TOTAL MASS (kg)  45 DOCUMENT NOTE OF TOTAL MASS (kg)  46 DOCUMENT NOTE OF TOTAL MASS (kg)  47 DOCUMENT NOTE OF TOTAL MASS (kg)  48 DOCUMENT NOTE OF TOTAL MASS (kg)  49 DOCUMENT NOTE OF TOTAL MASS (kg)  40 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  42 DOCUMENT NOTE OF TOTAL MASS (kg)  45 DOCUMENT NOTE OF TOTAL MASS (kg)  46 DOCUMENT NOTE OF TOTAL MASS (kg)	27 MACHINED AN	ND STUDDE	D CONNECTION	ONS : (5.4.3.8)			HEAT EXCHANGER (m³/h)	
22 ROTOR:  30 © COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)  31 COUPLINGS :(6.2.2) (Note 10)  32 MANUFACTURER  33 VITALING (kw per 100 r/min)  34 SPACER LENGTH  35 VITALING (kw per 100 r/min)  36 COUPLING BALANCE TO ISO 1940-1 G 6.3 (6.2.3)  37 COUPLING PER ISO 19691 (6.2.4)  38 COUPLING PER ISO 19691 (6.2.4)  39 © COUPLING PER ISO 19691 (6.2.4)  30 © COUPLING PER ISO 19691 (6.2.4)  30 © COUPLING GUARD G CALON (6.2.4)  31 API BASEPLATE NUMBER  32 (COUPLING GUARD STANDARD  33 API BASEPLATE NUMBER  34 (ANNEX D)  45 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  46 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  47 VITALING (ANNEX D)  48 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  49 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  40 MASS OF DUMP (kg)  40 MASS OF DUMP (kg)  41 MASS OF DUMP (kg)  42 MASS OF DUMP (kg)  43 MASS OF DAS-A4-RE-0046  44 MASS (kg)  45 DOcument Not.: 600-DAS-A4-RE-0046  46 Nover Job Not.:  47 DOCUMENT NOTE OF TOTAL MASS (kg)  48 DOCUMENT NOTE OF TOTAL MASS (kg)  49 DOCUMENT NOTE OF TOTAL MASS (kg)  40 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  42 DOCUMENT NOTE OF TOTAL MASS (kg)  43 DATE OF THE TOTAL MASS (kg)  44 DOCUMENT NOTE OF TOTAL MASS (kg)  45 DOCUMENT NOTE OF TOTAL MASS (kg)  46 DOCUMENT NOTE OF TOTAL MASS (kg)  47 DOCUMENT NOTE OF TOTAL MASS (kg)  48 DOCUMENT NOTE OF TOTAL MASS (kg)  49 DOCUMENT NOTE OF TOTAL MASS (kg)  40 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  41 DOCUMENT NOTE OF TOTAL MASS (kg)  42 DOCUMENT NOTE OF TOTAL MASS (kg)  45 DOCUMENT NOTE OF TOTAL MASS (kg)  46 DOCUMENT NOTE OF TOTAL MASS (kg)				. ,			TOTAL COOLING WATER (m³/h)	
COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)   SOUPLINGS (6.2.2)   (Note 10)			,	,				
COUPLINGS :(6.2.2)		BALANCE T	O ISO 1940 G	1.0 (5.9.4.4)				
MANUFACTURER				()				
RATING (kw per100 r/min)   VTA	`	,	•	MODEL SP	ACER(Type T	SK)	BEARING (TYPE / NUMBER ) (5.10.1) :	
34					( )			
35	_	· -		) SERVIC	E FACTOR			
36								
37	_			. ,	(6 2 1 1)			
COUPLING PER ISO 10441 (6.2.4)   COUPLING PER ISO STANDARD   ASME B151   COUPLING GUARD (6.2.14C)   OLIVISC. ISO GRADE   INSTRUMENTATION   ACCELEROMETER (6.4.2.1)   PROVISION FOR MOUNTING ONLY (5.10.2.11)   PRESSURE GAUGE TYPE   A   PLAN   31   PLAN   31   PLAN   31   PLAN   MASS OF PUMP (kg)   MASS OF DRIVER (kg)   Document TOTAL MASS (kg)   Document No.: 600-DAS-A4-RE-0046   Rev.: 0   Type: DAS   Type					(			
39			. ,					
NON SPARK COUPLING GUARD (6.2.14C)	<u> </u>			O ASME B	151			
41							INSTRUMENTATION	
## SASEPLATES:  ## API BASEPLATE NUMBER  ## API BASEPLATE (Rg)  ## API BASEPLATE (Rg)  ## ASS OF PUMP (Rg)  ## Document TOTAL MASS (Rg)  ## Document No.: 600-DAS-A4-RE-0046  ## Owner Job No.:  ## API BASEPLATE (NUMBER  ## API BASEPLA			•	,	(6.2	.14a)	ACCELEROMETER (6.4.2.1)	
43	_				,,,,	- /		
44 NON-GROUT CONSTRUCTION (6.3.13) 45 OTHER 46 MECHANICAL SEAL: (5.8.1) (Note 3 & 4) 47 CATEGORY 2 48 ARRENGMENT 1 49 TYPE A 50 PLAN 31 51 52 53 54  Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046  Owner Job No.:  TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6) PRESSURE GAUGE TYPE  REMARKS:  REMARKS:  REMARKS:  Document No.: 600-DAS-A4-RE-0046  Owner Job No.:  Type: DAS		TE NUMBER	<b>t</b>		(ANNEX D)		1 _	
45 OTHER  46 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  47 CATEGORY  48 ARRENGMENT  1			-		( ,		12	
46 MECHANICAL SEAL: (5.8.1) (Note 3 & 4)  47 CATEGORY  48 ARRENGMENT  1 TYPE  A  50 PLAN  31 REMARKS:  MASS OF PUMP (kg)  MASS OF DRIVER (kg)  MASS OF DRIVER (kg)  Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046  Rev.: 0  Owner Job No.:  Type: DAS	_		()				1 =	
CATEGORY   2		L : (5.8.1)	(Note 3	& 4)				
## ARRENGMENT 1		()	(	,				
49 TYPE A 50 PLAN 31 MASSES  MASS OF PUMP (kg) MASS OF BASEPLATE (kg) MASS OF DRIVER (kg) Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046  Rev.: 0  Owner Job No.: Type: DAS		т —				-	REMARKS:	
MASS OF PUMP (kg)   MASS OF BASEPLATE (kg)   MASS OF DRIVER (kg)   MASS OF DRIVER (kg)   MASS OF DRIVER (kg)   Document TOTAL MASS (kg)   Document No.: 600-DAS-A4-RE-0046   Rev.: 0   Type: DAS   Rev.: 0   Comment No.: Dassembly No.:   Type: DAS   Rev.: 0   Comment No.: Dassembly No.:   Comment No.: Dassembly No.:   Type: DAS   Comment No.: Dassembly No.:   Comme		-				-		
MASS OF PUMP (kg)  MASS OF BASEPLATE (kg)  MASS OF DRIVER (kg)  Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046  Rev.: 0  Owner Job No.:  Type: DAS						-	MASSES	
MASS OF BASEPLATE (kg)		-				-		
MASS OF DRIVER (kg) Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046  Rev.: 0  Owner Job No.:  Type: DAS								
Document TOTAL MASS (kg)  Document No.: 600-DAS-A4-RE-0046 Rev.: 0  Owner Job No.: Type: DAS								
Document No.: 600-DAS-A4-RE-0046 Rev.: 0  Owner Job No.: Type: DAS						Docu		
	<u> </u>							•
	1					Ow	ner Job No.: Type: DA	S
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CENTRIFUGAL  SPARE PARTS (TABLE 18)						
		QA	INSPECTION AND	<b>TESTING</b>	(CONT.)	
START-UP NORMAL MAINTENANCE		TEST		NON-WIT	WIT	OBSERVE
OTHERS 2 YEARS OF OPERATION LIST (Note 7)		■ HYDROST	ATIC (7.3.2)	0		$\overline{}$
OTHER PURCHASER REQUIREMENTS		1 🛋	ANCE (7.3.3)	Ö		Ö
COORDINATION MEETING REQUIRED (9.1.3)		O RETEST O	N SEAL	Ō	Ō	Ō
MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE	(7.3.3.2D)	Ü		
OMAX RELATIVE DENSITY		NPSH (7.3	.4.2)	0		$\circ$
MAX DIA. IMPELLERS AND / OR NO OF STAGES		1 = '	K VELOCITY	Ŏ	Õ	Ŏ
OPERATION TO TRIP SPEED		DATA (7.3.		0	0	0
OH3 BEARING HS6 LIFTER (8.1.2.6)		,	E UNIT TEST (7.3.4.3)	0	0	$\circ$
CONNECTION DESIGN APPROVAL (5.12.3.4)		I <u>~</u>	EVEL TEST (7.3.4.4)	ŏ	ĕ	Ŏ
TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		1 =	ESS PRIOR TO		$\tilde{\circ}$	Õ
TORSIONAL ANALYSIS REPORT (5.9.2.6)		•	SEMBLY (7.2.2.2)		$\circ$	
PROGRESS REPORTS (9.3.3)			OAD TEST (6.3.6)	0	$\bigcirc$	0
OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)		1 =	OR CO-PLANNER	$\tilde{O}$	$\sim$	$\tilde{\circ}$
ADDITIONAL DATA REQUIRING 20 YEARS RETENTION (7.2.1.1f)		•	G PAD SURFACE (6.3.	•	$\circ$	$\circ$
PIPING AND APPURTENANCES			G PAD SURFACE (6.3. CAL RUN UNIT OIL	_	$\bigcirc$	0
		1		O	$\circ$	$\circ$
IIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)			TABLE (7.3.4.7.1)			
VENT DRAIN COOLING WATER		_	HANICAL RUN AFTER	( )	$\circ$	$\circ$
MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)			STABLE (7.3.4.7.3)			
FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)		_	H. RUN TEST (7.3.4.7.	_		0
INSTALLATION LIST IN PROPOSAL (9.2.3L)		•	RESONANCE	O	0	$\circ$
INECTION BOLTING		TEST (7.3.	,	$\circ$		
PTFE COATING ASTM A153 GALVANIZED		_	/ EQUIPMENT	O	$\circ$	$\circ$
O PAINTED SS		TEST (7.3.			_	
QA INSPECTION AND TESTING		1 ~	ESTING (5.12.4.3)	O	0	$\circ$
SHOP INSPECTION (7.1.4) (Note 5)		O PER E				
PERFORMANCE CURVE APPROVAL		O PER A	SME V I	_		
TEST WITH SUBSTITUTE SEAL (7.3.3.2B)		<u> </u>		O	O	$\circ$
MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		Ι Ξ	KEEP REPAIR AND HT		,	
CASING IMPELLER SHAFT			SUBMIT TEST PROCE	DURES (7.3	.1.2 / 9.2.5	5)
OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MED	H. SEAL PARTS	○ VENDOR S	SUBMIT TEST DATA W	ITHIN 24 H	OURS (7.3	3.3.3E)
CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)		O INCLUDE F	PLOTTED VIBRATION	SPECT A		
INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)		SUBMIT IN	SPECTION CHECK LI	ST (7.1.6)		
MAG PARTICLE LIQUID PENETRANT						
RADIOGRAPHIC ULTRA SONIC						
INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)						
MAG PARTICLE LIQUID PENETRANT						
RADIOGRAPHIC ULTRA SONIC						
HARDNESS TEST REQUIRED :	(7.2.2.3)					
ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3						
FOR	_					
METHOD	_					
	REMARKS	i				
	Docum	ent No.: 600	-DAS-A4-RE-00	46	R	lev.: 0
	Owner					

#### client:



#### TITLE: DATA SHEET FOR DRYER SCRUBBER PUMP (P-621)

Note 1: ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH "TECHNICAL SPECIFICATION FOR LV MOTOR" DOC.No.900-SPC-A4-EE-0005 MOTOR ENCLOSURES SHALL BE OF TOTALLY ENCLOSED FAN-COOLED (TEFC)

Note 2: TYPE OF PROTECTION SHALL BE Aexd

Note 3: MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 3rd EDITION :2004. VENDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEET FOR MECHANICAL SEALS.

Note 4: VENDOR IS REQUIRED TO REVIEW AND CONFIRM.

Note 5: REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC.No.: 900-ITP-A4-RE-0001.

Note 6: ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLANGES SHALL BE AS PER ISO STANDARD

Note 7: SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIRED FOR PRE-COMMISIONNING, COMMISIONING, START-UP AND MAINTANANCE PERIOD.

Note 8: NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST 1 METER LESS THAN NPSHA.

Note 9: DESIGN TEMPRATURE RANGE IS: -10 /150 °C. Also design pressure is: 10 Barg.

Note 10: DRY, FLEXIBLE, MULTI DISK, S.S MEMBRANE SPACER TYPE COUPLING SHALL BE USED.

DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR.

note11: Ex-group: ExdIIBT4

Note 12: REFERE TO "UTILITY CONDITION" DOC.No.: 900-SPC-A4-PR-0006.

Document No.: 600-DAS-A4-RE-0046	Rev.: 0
Owner Job No.:	Type: DAS
	Page 4 of 4

PROJECT: PP- PE PILOT PLANT		client:	<u>≜</u>				
TITLE: DATA SHEET FOR JACKET RWA PUMP (P-	711)		شرکت ملی صنایع پتر شرکت پژوهش و فناوری				
DATA SHEET FO	Document No.: 700-DAS-A		Rev.: 0				
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client:



	LE. DAI	A SHEET FOR S	JACKET KI	WA FOWIF (F-7 I	1)						روشيمى	ت پژوهش و فناوری پتر	شرک
				CENTRIFUGAL	PUMP	DATA	SHEET,	SI UNI	T T				
1	APPLICABLE	TO: PROPOS		PURCHASE									Rev
2	FOR		NPC R&1		~~~~~~~	UNIT	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		7(	00			
3	SITE	NPC R&	T CENTRE -	ARAK - IRAN	ananananananananananananan	SREVIC	E		JACKET	RWA	PUMP		
4	No. of Req'd:	1 Service :	1 / Stand by										
5	NOTES : INF	ORMATION BELOW T	TO BE COMPLE	TED OBY PUI	RCHASER		BY MANUFA	ACTURER	D BY	MANU	JFACTURE	R OR PURCHASER	_
6		Т	T T	DATA SHEETS								ISIONS	_
7 8	DUMD	ITEM NO. <b>P-711</b>	ATTACHED	ITEM NO.	ATTA	ACHED	ITEM N	NO.	ATTACHED		DATE	BY	-
	PUMP				+	$\aleph$			$\frac{\circ}{\circ}$	1			_
9	MOTOR	PM-711				$\overline{\bigcirc}$			$\stackrel{\circ}{\sim}$	2			n an an an an an an an an
	GEAR TURBINE		$+\otimes$		_	$\otimes$		-	-2 $-$	3			
		OVEDLAV CTANDAD	100	TANDADD.	$\overline{}$	$\circ$				-			vocano a constante de la const
	APPLICABLE	OVERLAY STANDAR  OPERATIN			/2				LIQUID (	5 <b>5 4 2</b> \			
13	FLOW, NORI		(m³/h) RATE	, ,	(m <sup>3</sup> /h)	HOUID.	TYPE OR NA				20%Glyco	alo.	
		VIAL <b>6</b>	(III/II) KAII	:D <b>0.0</b>	(111 /11)								
	OTHER	ECCUPE MAY / DATE	D 7.6	/ 4.25	(	UHAZ	ARDOUS	C.	LAMMABLE	: '	TOXIC	(5.1.5)	-
	DISCHARGE	RESSURE MAX / RATE	.J 7.3	/ 1.25 4.6	(bara) (bara)	DIIMDIN	G TEMF( <sup>∪</sup> C)	,	MIN. 10	-	NORMAL 30	MAX.	
		AL PRESSURE	nn an a	3.35	(bara)	1	R PRESS . (b	· -	0.01		0.04	0.15	
	DIFF. HEAD			10.4 (Note 8)	(m)	1	/E DENSITY	· · ·	1.01		1.02	1.04	_
20	PROCESS V	ARIATIONS (5.1.4)				1	ITY (cP)		1.93		1.24	0.76	
		ONDITIONS (5.1.4)		ED DELIVERY VAL	VE		C HEAT, C	vocanana		3.92		(kj/kg .k.)	
		CONT O INT		TARTS/DAY)	*****************		ORIDE CON						
23	O PARALL	EL OPERATION REQ				_	CONCENTR	nerven			n)	WET (5.12.1.12c)	
24	LOCATION		E DATA (5.1.	3)		CORRO	SIVE / EROS			N/A	4.4\	(5.12.1.9)	
25 26	LOCATION: (	5.1.30) R	OUTDOO	R UNHEATED		- ANN			ATERIALS			4)	_
	_	_	_	_			EX H CLASS					(°C)	
27	_	RICAL AREA CLASSIF	,	*		_	DESIGN ME			~~~~~~~			**********
28 29	CL	l GR RIZATION REQ D.	C,T4 DIV	2(Note 2)			UCED HARI REL / CASE			EUD. ELLEF	. ,	C.S.	
	SITE DATA (		OTROPICA	LIZATION REQ D.			E / IMPELLE			ELLER		0.3.	
			) DADOME	TER <b>810</b>	(mala m m)				111100				
31	_	OF AMBIENT TEMPS			(mbar) ( <sup>O</sup> C)	SHA	USERS						
32						Прігі	USERS		PERFORM	ANCE	_		
33 34	_	VE HUMIDITY:MIN / M ONDITIONS: (5.1.30)		OUST / 86		DD ODOS	SAL CURVE	2	PERFORM	IANCE		(r/min)	
35	ONOSUAL CO	, ,	CORROS		3		ELLER DIA F		MA	X	MIN		***************************************
36	O I I I I						ELLER TYPE			CLC		()	
37		D	RIVER TYPE				ED POWER		<b>A</b> (kw		CIENCI	(%)	
38		ION MOTOR	STEAM TURE	INE GEAR			IMUM CONT	INUOUS F	LOW:			_	
39	OTHER		(Note	1)			RMAL		m³/h) STA	ABLE		(m³/h)	**********
40		<b>A</b>		12.1.1)			FERRED OF				TO	(m³/h)	************
41			DRIVER (6.1.1	/ 6.1.4)			OWABLE OF				TO	(m³/h)	
42	MANUF				(r/min)		K. HEAD @ R					(m)	
43		VIA (KV	v) 🔲		(r/min)		(. POWER @		WIPELLER			(kw)	
44	☐ FRAME		ENCLOS				HR AT RATE					(m) (5.1.10)	
45	HORIZO			SERVICE FACTOR			SUCTION S			1300		<b>I,RPM</b> (5.1.11)	***********
46 47	TYPE	PHASE / HERTZ	400 / ASYNCHRO	ANALASA ANALAS	50		( . SOUND PI MAX. SOUN			***********	85	(dba) (5.1.16) (dba) (5.1.16)	*********
	<b> </b> =	M CTADTING VOLT:											
48		M STARTING VOLTAG				<b>L⊿</b> EST	MAX. SOUN			0 /5 4	2) //	(dba) (5.1.16)	-
49	INSULA		TEMP. RISE			FLEGT			ONDITION				_
50 51	FULL LO	OAD AMPS O ROTOR AMPS				ELECTR	VERS		TAGE 100	F	PHASE 3	HERTZ <b>50</b>	-
51 52		NG METHOD		D.O.L		1	TING	- 4	100		J	30	-
53	LUBE					1	TEM VOLTA	GE DIP	O 80%	6 1	OTHER	(6.1.5)	+
54		TYPE / NUMBER) :				STEAM		PRESS.	MAX. TEM		MIN. PRES		1
55	RADIAL		1			DRIVER							
56	THRUST	******************************	1			HEATING							
57		AL THRUST CAPACIT			4.0	1	G WATER:		SOURC	903030		(02)	
58	UP	(N)	DOWN		_ (N)	SUPPLY					URN TEMP		
59 60						NORM.	PRESS. T. PRESS.		,		PRESS. .OW. D.P.	(bar) (bar)	
							DE CONCEN		,	vv. ALL	VV. D.F.		
61					г -	CHLUKI	DE CONCEI	VIRALION				(mg/kg)	
					Docur	nent N	o.: 700-E	DAS-A4	-RE-004	7		Rev.: 0	
					Owne	r Job N	lo.:					Type: DAS	
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			سر عب پرومس و عبور				
	. PUMP [	DATA SHEET, SI UNIT					
CONSTRUCTION	_	SURFACE PREPARATION AND PAINT	Rev				
	ccw	MANUFACTURER'S STANDARD OTHER SE	******				
3 PUMP TYPE: (4.1) ISO		SPECIFICATION NO. 900-SPC-A4-PD-0002 PUMP:	i				
4 OH1 OH3 OH6 OTHER  5 CASING MOUNTING:	PRIMER	PRODUCTION OF THE PRODUCTION O					
6 CENTERLINE IN-LINE OTHER		FINISH COAT					
7		BASEPLATE: (6.3.1.7)					
8 CASING TYPE :		PRIMER					
9 SINGLE VOLUTE MULTIPLE VOLUTE DIFFUSER		FINISH COAT					
10 CASE PRESSURE RATING :		DETAILS OF LIFTING DEVICES (6.3.20)					
11 OH6 PUMP SUCTION REGION DESIGNED FOR MAWP (5.3.6)		SHIPMENT : (7.4.1)					
12 MAX. ALLOWABLE WORKING PRESSURE	(bar)		EQUIRED				
13 @ 180 (°C)	(h = -)	OUTDOOR STORAGE MORE THAN 6 MONTHS	Annual contract and annual				
14 HYDRO TEST PRESSURE 1.5 x MAWP 15 NOZZLE CONNECTIONS: (5.4.2) (Note 6)	(bar)						
FLANOE	201	HORIZONTAL STORAGE VERTICAL STORAG	- variation of the second of t				
16 SIZE FLANGE FACG POSITION RATING	JIN	O TYPE OF SHIPPING PREPARATION  HEATING AND COOLING					
18 SUCTION 2" 150# RF		HEATING JACKET REQ D. (5.8.9)					
19 DISCHARGE 1 1/2" 150# RF		COOLING REQ D.	palantan selantah anahara				
20		COOLING WATER PIPING PLAN (6.5.3.1)					
21 PRESSURE CASING AUX. CONNECTIONS : (5.4.3)		C.W. PIPING:					
NO. SIZE (DN) TYPE		PIPE TUBING: FITTINGS					
23 DRAIN 1/2" VALVE		C.W. PIPING MATERIALS:					
24 VENT 1/2" VALVE	:D	S.STEEL C.STEEL GALVANIZED	Annes and an annes and an annes and an annes and an				
25 WARM-UP		COOLING WATER REQUIREMENTS :	(m³/h)				
27 MACHINED AND STUDDED CONNECTIONS: (5.4.3.8)		BEARING HOUSING HEAT EXCHANGER	(m³/h)				
28 O CYLINDRICAL THREADS REQUIRED (5.4.3.3)		TOTAL COOLING WATER	(m³/h)				
29 ROTOR :	HEAT MEDIUM: OSTEAM OTHER	· · · · · · · · · · · · · · · · · · ·					
30 COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)	HEATING PIPING: TUBING PIPE	managaman ana ana ana ana ana ana ana ana ana					
31 COUPLINGS :(6.2.2) (Note 10)		BEARING AND LUBRICATION					
32 MANUFACTURER VTA MODEL SPACER(Type	pe TSK)	BEARING (TYPE / NUMBER ) (5.10.1) :					
RATING (kw per100 r/min) VTA		RADIAL /					
34 SPACER LENGTH VTA (mm) SERVICE FACTOR		THRUST /					
35 COUPLING BALANCED TO ISO 1940-1 G 6.3 (6.2.3)		LUBRICATION (5.11.3,5.11.4):					
36 COUPLING WITH PROPRIETARY CLAMPING DEVICE (6.2.1.1)		GREASE OIL					
37 COUPLING PER ISO 14691 (6.2.4) 38 COUPLING PER ISO 1 10441 (6.2.4)		PURGE OIL MIST OPURE OIL MIST  CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):					
39 COUPLING PER ISO COUPLING PER ISO ASME B151		OIL VISC. ISO GRADE					
40 NON SPARK COUPLING GUARD (6.2.14C)		INSTRUMENTATION					
41 O COUPLING GUARD STANDARD PER	(6.2.14a)	ACCELEROMETER (6.4.2.1)					
42 BASEPLATES:	noner	PROVISION FOR MOUNTING ONLY (5.10.2.11)					
43 API BASEPLATE NUMBER (ANNEX	X D)	FLAT SURFACE REQ D (5.10.2.12)					
44 O NON-GROUT CONSTRUCTION (6.3.13)		TEMP GAUGES (WITH THERMO WELLS) (8.1.3.6)					
45 OTHER		PRESSURE GAUGE TYPE					
46 MECHANICAL SEAL : (5.8.1) (Note 3 & 4)							
47 CATEGORY 48 ARRENGMENT		REMARKS:					
49 TYPE		INCINITION .					
50 PLAN 01		MASSES					
51		MASS OF PUMP (kg)					
52	MASS OF BASEPLATE (kg)						
53		MASS OF DRIVER (kg)					
54	D	TOTAL MASS (kg)	Rev.: 0				
Document No.: 700-DAS-A4-RE-0047							
	Owner	Job No.:	Type: DAS				
			Page 2 of 4				



	CENTRIFUGAL PUMP DATA SHEET, SI UNIT									
SPARE PARTS (TABLE 18)  QA INSPECTION AND TESTING (CONT.)										
2	■ START-UP NORMAL MAINTENANCE		TEST	NON-WIT	WIT	OBSERVE				
3	OTHERS 2 YEARS OF OPERATION LIST (Note 7)		HYDROSTATIC (7.3.2)	$\circ$		$\circ$	**************			
4	OTHER PURCHASER REQUIREMENTS		PERFORMANCE (7.3.3)	$\circ$		$\circ$				
5	COORDINATION MEETING REQUIRED (9.1.3)		O RETEST ON SEAL	$\circ$	$\circ$	$\circ$				
6	MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)							
7	MAX RELATIVE DENSITY		NPSH (7.3.4.2)	$\circ$		$\circ$				
8			TRUE PEAK VELOCITY	$\circ$	$\circ$	$\circ$				
9	OPERATION TO TRIP SPEED		DATA (7.3.3.4D)							
10	OH3 BEARING HS6 LIFTER (8.1.2.6)		COMPLETE UNIT TEST (7.3.4.	3)	$\circ$	$\circ$				
11	OCONNECTION DESIGN APPROVAL (5.12.3.4)		SOUND LEVEL TEST (7.3.4.4)	$\circ$		$\circ$				
12	TORSIONAL ANALYSIS REQUIRED (5.9.2.1)		CLEANLINESS PRIOR TO		$\circ$	$\circ$	***********			
13	TORSIONAL ANALYSIS REPORT (5.9.2.6)		FINAL ASSEMBLY (7.2.2.2)	_	_	_				
14	\ ′		NOZZLE LOAD TEST (6.3.6)	Ō	Ō	Ō				
15			CHECK FOR CO-PLANNER	0	$\circ$	$\circ$				
16	, , ,		MOUNTING PAD SURFACE (6							
17	PIPING AND APPURTENANCES		MECHANICAL RUN UNIT OIL	$\circ$	$\circ$	$\circ$				
	MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		TEMP P. STABLE (7.3.4.7.1)	_						
19			4 HR. MECHANICAL RUN AFT	ER ()	$\circ$	$\circ$				
20	1 <del>22</del>		OIL TEMP STABLE (7.3.4.7.3)	_	_					
21	FLANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)		4 HR. MECH. RUN TEST (7.3.4	~		$\circ$	***********			
22	<u> </u>		BRG HSG RESONANCE	O	$\circ$	$\circ$	``````````````````````````````````````			
	CONNECTION BOLTING		TEST (7.3.4.6)	$\circ$			,			
24	O PTFE COATING OASTM A153 GALVANIZED		AUXILIARY EQUIPMENT	O	$\circ$	$\circ$				
25	O PAINTED SS  QA INSPECTION AND TESTING		TEST (7.3.4.5)	$\circ$	$\sim$					
26			IMPACT TESTING (5.12.4.3)	O	0	$\circ$				
27			PER ANALYZII	man.			************			
28			O PER ASME V III		$\circ$		************			
29			VENDOD KEED DEDAID AND	U	0	O)				
30	MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPAIR AND		•	•				
31	CASING IMPELLER SHAFT	ADTO	VENDOR SUBMIT TEST PROC	,		,				
32	OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL P	ARIS	VENDOR SUBMIT TEST DATA		100RS (7	7.3.3.3⊵)				
33	CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)		INCLUDE PLOTTED VIBRATIO							
34			SUBMIT INSPECTION CHECK	LIST (7.1.0)			*****************			
35 36										
37	INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)						*****************			
38										
39							***************************************			
40		(7.2.2.3)					,			
41	ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3	( · · = · <b>2</b> · 3 )								
42	FOR									
43	METHOD									
44										
45		REM	IARKS							
46										
47					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
48										
49										
50										
51		nenenenenenenenenenenenenenenenenenene		whenenenenenenenenenenenenenenenenenen	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~					
52		Documer	nt No.: 700-DAS-A4-RE-0	147		Rev.: 0				
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		Owner Jo	ו.סאו שכ			Type: DAS				
						Page 3 of 4				

## client: PROJECT: PP-PE PILOT PLANT TITLE: DATA SHEET FOR JACKET RWA PUMP (P-711) شرکت پژوهش و فناوری پتروشیمی ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH "TECHNICAL SPECIFICATION FOR LV Note 1: MOTOR" DOC.No.900-SPC-A4-EE-0005 MOTOR ENCLOSURES SHALL BE OF TOTALLY ENCLOSED FAN-COOLED (TEFC) TYPE OF PROTECTION SHALL BE Aexd Note 2: Note 3: MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 3rd EDITION :2004. VENDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEET FOR MECHANICAL SEALS. Note 4: VENDOR IS REQUIRED TO REVIEW AND CONFIRM. REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC.No.: 900-ITP-A4-RE-0001. Note 5: Note 6: ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLANGES SHALL BE AS PER ISO STANDARD. Note 7: SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIRED FOR PRE-COMMISIONNING, COMMISIONING, START-UP AND MAINTANANCE PERIOD. NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST 1 METER LESS THAN NPSHA. Note 8: DESIGN TEMPRATURE RANGE IS: -50 /180 °C. ALSO DESIGN PRESSURE IS: 10 Barg. Note 9: DRY, FLEXIBLE, MULTI DISK, S.S MEMBRANE SPACER TYPE COUPLING SHALL BE USED. Note 10: DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR. note11: Ex-group ExdIIBT4 Note 12: REFERE TO "UTILITY CONDITION" DOC.No.: 900-SPC-A4-PR-0006.

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PROJECT: PP- PE PILOT PLANT		client:	<u>*</u>
TITLE: DATA SHEET FOR JACKET RWA PUMP (	P-712)	ع پتروشیمی اوری پتروشیمی	شر کت ملی صنای شر کت پژوهش و فن
DATA SHEET FO	DR JACKET RW (P-712)		Rev.: 0
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			Page A

PROJECT: PP- PE PILOT PLANT

شرکت ملی صنایع پتروشیمی

 شرکت پژوهش و فناوری پتروشیمی

 شرکت پژوهش و فناوری پتروشیمی

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PF	ROJECT:	PP- PE PILOT	Γ PLANT					client:				
TI	TLE: DAT	A SHEET FOR	R JACKET R	WA PUMP (P-712	2)				_	کت ملی صنایع پتروشی پژوهش و فناوری پترو		
				CENTRIFUGAL	PUMP	DATA S	HEET, SI UNIT					
1	APPLICABLE	TO: PRO	POSAL OPI		AS BU		,				Rev	
2	FOR		NPC R&T		_	UNIT		700				
3	SITE	NPC R	&T CENTRE - A	RAK - IRAN		SREVICE		JACKET RV	VA PUMP			
4	No. of Reg'd:	1 Servi	ce: 1 / Stand by				-			<del></del> -		
5				TED O BY PURC	HASER		BY MANUFACTUREF	R D BY M	IANUFACTURI	ER OR PURCHASE	ER	
6				DATA SHEET:					T	VISIONS	1	
7		ITEM NO.	ATTACHED	ITEM NO.		ACHED	ITEM NO.	ATTACHED		BY		
	PUMP	P-712	ATTACTIED	TILWING.	711	AOILD	TILWING.	ATTACHED	1	Бі	1	
9	MOTOR	PM-712	+		+	$\prec$		$\vdash$	2			
	GEAR	1 101-7 12			$\rightarrow$	$\prec$		$\vdash$	3		1	
	-		$+ \times +$		$\rightarrow$	$\prec$		$\vdash$				
	TURBINE	<u> </u>			+				4			
12	APPLICABLE	OVERLAY STAND	. ,		/_\				5	<u> </u>	_	
13			FING CONDITIO		2			LIQUID (5.1				
14	FLOW, NORI	MAL 8	(m³/h) RATE	8.8 (n	n³/h)	LIQUID T	YPE OR NAME		r + 20%Glyc	ole		
15	OTHER					○ HAZ	ARDOUS C	)FLAMMABLE	■ TOXI	C (5.1.5)		
16	SUCTION PF	RESSURE MAX / RA	ATED <b>7.5</b>	/ 1.25	(bara)			MIN.	NORMA	AL MAX.		
17	DISCHARGE	PRESSURE		4.4	(bara)	PUMPING	G TEMP ( <sup>O</sup> C)	10	30	55		
18	DIFFERENTI	AL PRESSURE		3.15	(bar)	VAPOUR	PRESS . (bara)	0.01	0.04	0.15		
19	DIFF. HEAD	26.80	(m) NPSHA	10.4 (Note 8)	(m)	RELATIV	E DENSITY (SG):	1.01	1.02	1.04		
		ARIATIONS (5.1.4)	`	. ( ,		VISCOSI	, ,	1.93	1.24		1	
		CONDITIONS (5.1.4)		DELIVERY VALVE			CHEAT, C <sub>P</sub>		3.92	(kj/kg .k.)	1	
		CONT OI			<u>'</u>		ORIDE CONCENTRA					
		LEL OPERATION RI				_	CONCENTRATION				-	
	PARALL			2)						WET (5.12.1.12c)		
24			SITE DATA (5.1.	ა)			SIVE / EROSIVE AGE		N/A	(5.12.1.9)	-	
25							MA					
26		R				ANN	EX H CLASS (5.12.1.	1)	S-4 (Note			
27	_	RICAL AREA CLASS					DESIGN METAL TEM			. ,		
28	CL	<b>I</b> GR	C,T4 DIV	2(Note 2)		REDUCED HARDNESS MATERIALS REQ D. (5.12.1.12)						
29	WINTER	RIZATION REQ D.	TROPICAL	IZATION REQ D.		BAR	REL / CASE C	.S. IMP	PELLER	C.S.		
30	SITE DATA (					CAS	E / IMPELLER WEAR	RINGS				
31	ALTITUE	DE <b>1889</b> (	m) BAROMET	ER <b>810</b> (I	mbar)	SHA	FT					
32	RANGE	OF AMBIENT TEM	PS:MIN,MAX.	-28 / 44	(°C)	DIFF	USERS					
33		VE HUMIDITY:MIN		/ 86	(%)		O P	ERFORMA	NCE			
34		ONDITIONS: (5.1.3				PROPOS	AL CURVE NO.			(r/min)		
35		•	CORROS				ELLER DIA RATED	MA	X. MI			
36			00111100				ELLER TYPE		CLOSE	()		
37			DRIVER TYPE						) EFFICIEN_	(0/.)		
			_			=	-		) EFFICIEN	(%)		
38			OSTEAM TURBIN	_		1—	MUM CONTINUOUS			( 3 //- )	-	
39	OTHER		(Note 1	)			RMAL	(m³/h) STA		(m³/h)		
40							FERRED OPER. REG	-	TC	(m³/h)		
41			R DRIVER (6.1.1	l / 6.1.4)		ALL	OWABLE OPER. REG	SION	TC	(m³/h)		
42	MANUF/	ACTURER				MAX	HEAD @ RATED IM	PELLER		(m)		
43		VTA (	[kw	(r/	/min)	MAX	. POWER @ RATED	IMPELLER		(kw)		
44	FRAME		ENCLOSU	RE		NPS	HR AT RATED FLOW	1		(m) (5.1.10)		
45	HORIZO	NTAL VERT	TICAL SI	ERVICE FACTOR		MAX	SUCTION SPECIFIC	SPEED:	13000 M3/Hr	, <b>M,RPM</b> (5.1.11)		
46	VOLTS /	PHASE / HERTZ	400 /	3 / 50		MAX	. SOUND PRESS LE	VEL REQ. D	85	(dba) (5.1.16)		
47	TYPE	_	ASYNCHRO			EST	MAX. SOUND PRESS	S LEVEL		(dba) (5.1.16)		
48	_	M STARTING VOLT					MAX. SOUND POWE			(dba) (5.1.16)		
49	_		↑TEMP. RISE			<u></u>	UTILITY CO		5 1 3) (Note			
50			O 12 14.02 _			ELECTRI		OLTAGE	PHASE	HERTZ		
	-	D ROTOR AMPS					/ERS	400	3	50	1	
51		-		D O I				400		50		
52		NG METHOD _		D.O.L			TING	0.00			4	
53							TEM VOLTAGE DIP	809		1 ' '		
	·	TYPE / NUMBER) :				STEAM	MAX. PRESS.	MAX. TEN	IP MIN. PRE	SS MIN. TEMP	4	
55	RADIAL		1			DRIVERS	3					
56	THRUST	Γ	1			HEATING	·				1	
57	VERTIC.	AL THRUST CAPA	CITY			COOLING	G WATER: (5.1.19)	SOURC	E		L	
58	UP	(N)	DOWN	(N	1)	SUPPLY	TEMP.	(°C) MA	X. RETURN TE	EMF ( <sup>O</sup> C)	1	
59		· ·		,		NORM. P	RESS.	(bar) DE	SIGN PRESS.	(bar)		
60	1						. PRESS.	- ' '	X. ALLOW. D.			
61	1						DE CONCENTRATION	- ' '		(mg/kg)		
62										a/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		
J_					Doci	ument N	lo.: 700-DAS-A	4-RE-004	8	Rev.: 0	1	
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TITLE: DATA S	HEET FO	R JACKET	Γ RWA PU	MP (P-712)				شرکت ملی صنایع شرکت پژوهش و فناور	,		
			CENTE	RIFUGAL PU	MP	DATA SHEET, SI UNI	T				
1		CONSTRUC	TION			SURFACE	PREPARATION AND PAI	NT	Rev		
2 ROTATION : (VIE	WED FROM (	COUPLING EN	ID)	cw cc/	W	MANUFACTURER'S STA		SEE BELOW			
3 PUMP TYPE : (4.	,					SPECIFICATION NO	900-SPC-A4-PD-0	002			
4 OH1	онз 🔲	OH6	OTHER			PUMP :					
5 CASING MOUNT						PRIMER					
6 CENTERLIN	E 🔲 IN-L	.INE	OTHER			FINISH COAT					
7						BASEPLATE : (6.3.1.7)					
8 CASING TYPE :						PRIMER					
9 SINGLE VOL		LTIPLE VOLUT	E	DIFFUSER		FINISH COAT					
10 CASE PRESSUR						_	G DEVICES (6.3.20)				
11 OH6 PUMP S						SHIPMENT: (7.4.1)	DODE A EVENET BOYAN	0.050111050			
12 MAX. ALLOV		_	KE		(bar)		PORT EXPORT BOXIN	G REQUIRED			
13 @		( <sup>O</sup> C)	1.5 x MA	WD	/h = =\	OUTDOOR STORAGE M					
14 HYDRO TES 15 NOZZLE CO				WP	(bar)	SPARE ROTOR ASSEMBLY I  HORIZONTAL STORAGE	_	PACE			
16	SIZE	FLANGE	FACG	POSITION	1	O TYPE OF SHIPPING PRE	•	WOL			
17	SIZE	RATING	FACG	POSITION			TING AND COOLING				
18 SUCTION	2"	150#	RF		1	○ HEATING JACKET REQ			1		
19 DISCHARGE	1 1/2"	150#	RF		1	COOLING REQ D.	(/				
20						COOLING WATER PIPIN	G PLAN (6.5.3.1)				
21 PRESSURE	CASING AUX	. CONNECTIO	NS : (5.4.3)			C.W. PIPING:	· · · · · ·				
22		NO.	SIZE (DN)	TYPE	1	PIPE TUBIN	G: FITTINGS				
23 DRAIN			1/2"	VALVED	1	C.W. PIPING MATERIALS:					
24 VENT			1/2"	VALVED		S.STEEL CC.S	TEEL GALVANIZE	ED			
25 WARM-UP						COOLING WATER REQUIRE	MENTS:				
26						BEARING I	HOUSING	(m <sup>3</sup> /h)			
27 MACHINED						HEAT EXC	-	(m <sup>3</sup> /h)			
28 CYLINDRICAL THREADS REQUIRED (5.4.3.3) 29 ROTOR: COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)				TOTAL COOLING WATER(m³/h)							
				HEAT MEDIUM: OSTEAM OTHER HEATING PIPING: OTUBING PIPE							
-			5 1.0 (5.9.4.4)				NG AND LUBRICATION				
31 COUPLINGS :(6.2 32 MANUFACTI	,	ote 10)	MODEL <b>CD</b>	ACED/Type TS	K)						
33 RATING (kw				ACEN(Type 13	IX)	BEARING (TYPE / NUMBER )					
34 SPACER LE				FACTOR		RADIAL /   THRUST /					
35 COUPLING I	-					LUBRICATION (5.11.3,5.11.4) :					
36 O COUPLING			, ,	(6.2.1.1)		GREASE OIL					
37 O COUPLING	PER ISO 1469	1 (6.2.4)		,		PURGE OIL MIST PURE OIL MIST					
38 COUPLING	PER ISO 104	41 (6.2.4)				CONSTANT LEVEL OILER PREFERENCE (5.10.2.2):					
39 COUPLING	PER ISO		O ASME B	151		OIL VISC. ISO GRADE					
40 NON SPARK	COUPLING (	GUARD (6.2.14	IC)			IN	ISTRUMENTATION				
41 COUPLING	GUARD STAN	DARD PER		(6.2	14a)	ACCELEROMETER (6.4.					
42 BASEPLATES:						PROVISION FOR MOUN					
43 API BASEPL				(ANNEX D)		FLAT SURFACE REQ D			-		
44 O NON-GROU	T CONSTRUC	TION (6.3.13)				TEMP GAUGES (WITH T					
45 OTHER		/N-4- 0	0.4\			PRESSURE GAUGE TYP	'E				
46 MECHANICAL SE		(Note 3	& 4)			_					
47 CATEGORY 48 ARRENGME					-	REMARKS :					
49 TYPE					-	REMARKS.					
50 PLAN			01		-		MASSES				
51					-	MASS OF PUMP (kg)					
52						MASS OF BASEPLATE (	kg)				
53						MASS OF DRIVER (kg)	-				
54						TOTAL MASS (kg)					
					Do	cument No.: 700-DAS	6-A4-RE-0048	Rev.: 0			
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SPARE PATTS (TABLE 19)	ТІТ	LE: DATA SHEET FOR JACKET RWA PUMP (P-712)				_		شرکت ملی صن کت پژوهش و ف	
SPARE PARTS (TABLE 19)		CENTRIFUGAL PUMP	DATA S	HEET. SI UNIT					
O   OTHER PURCHASER REQUIREMENTS	1			· · · · · · · · · · · · · · · · · · ·	ION AND T	ESTING (	CONT.)	)	Rev.
OPTHERS   2 VEARS OF OPERATION LIST (Note 7)	2	START-UP NORMAL MAINTENANCE							
OTHER PURCHASER REQUIREMENTS   PERFORMANCE (7.3.1)   O	3	OTHERS 2 YEARS OF OPERATION LIST (Note 7)		HYDROSTATIC (7.3.2	_	_		$\overline{}$	
DAMADIAN INSCHARGE PRESSURE TO INCLUDE (5.3.2)	4	OTHER PURCHASER REQUIREMENTS				Ō		_	
MAX RELATIVE DENSITY	5	COORDINATION MEETING REQUIRED (9.1.3)	$\overline{}$	RETEST ON SEAL		$\circ$	$\circ$		
MANDRUS IMPELIERS AND JOR NO OF STAGES	6	MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)		LEAKAGE (7.3.3.2D)					
DATA (2.3.49)    OPERATION TO TIRE SPEED   OURS GREATING HIS LETTER BL 22)   OURS GREATING HIS LETTER BL 23)   OURS GREATING HIS LETTER BL 23)   OURS GREATING HIS LETTER BL 23)   OURS GREATING HIS LETTER BL 24)   OURS GREATING HIS LETTER BL 24)   OURS GREATING HIS LETTER BL 25)   OURS GREATING HIS LETTER BL 25	7	OMAX RELATIVE DENSITY		NPSH (7.3.4.2)		0			
10	8	MAX DIA. IMPELLERS AND / OR NO OF STAGES		TRUE PEAK VELOCIT	Υ	$\circ$	$\circ$	$\circ$	
	9	OPERATION TO TRIP SPEED		DATA (7.3.3.4D)					
	10		O		, ,	_	Ō		
13	11					O			
14		<u> </u>					$\circ$	$\circ$	
DOCUMENT NO.: 700-DAS-A4-RE-0048  Rev.: 0  OUTURN DOCUMENT NO.: 700-DAS-A4-RE-0048  Rev.: 0	13			,	,				-
		<u>`</u>	10		. ,	_	$\circ$	_	
PIPING AND APPURTENANCES   MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)   MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)   MOUNT SEAL RESERVOIR OF BASEPLATE (6.5.1.4)   MARTERIAL CERTIFICATION REQUIRED (6.5.2.1.8)   MAG PARTICLE   LIQUID PENETRANT   MOUNT SEAL RESERVOIR OF BASEPLATE (6.5.1.4)   MARTERIAL CERTIFICATION REQUIRED (7.3.1.2.1.5)   MAG PARTICLE   LIQUID PENETRANT   MOUNT SEAL RESERVOIR OF BASEPLATE (6.5.1.4)   MOUNT S						O	$\circ$	$\circ$	
MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)		· · · · · · · · · · · · · · · · · · ·			, ,	$\bigcirc$	$\bigcirc$	$\bigcirc$	
19			-			0	$\cup$	$\circ$	
Dill TEMP STABLE (7.3.4.7.3)    MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)   MOUNT SEAL RESERVOIR OFF BASEPLATE (7.3.4.7.3)   MAGE PARTICLE OFF BASEPLATE (7.3.4.7.3)   MAGE PARTICLE OFF BASEPLATE (7.3.4.7.3)   MOUNT SEAL RESERVOIR OFF BASEPLATE (7.3.4.7.3)   MOUNT SEAL RESERVOIR OFF BASEPLATE (7.3.4.7.3)   MOUNT SEAL RESERVOIR OFF BASEPLATE (7.3.4.7.3)   MAGE PARTICLE OFF BASEPLATE (7.3.4.7.3)   MOUNT SUBSTITUTE SEAL				,	,	$\circ$	$\bigcirc$	$\bigcirc$	
## HANGES REQ D IN PLACE OF SOCKED WELD UNIONS (6.5.2.8)   INSTALLATION LIST IN PROPOSAL (8.2.3L)   INSTALLATION BOLTING						O	$\cup$	0	
Document No.: 700-DAS-A4-RE-0048    Security   Security				,	,	$\circ$		$\bigcirc$	
ZS CONNECTION BOLTING  PITE COATING ASTM A153 GALVANIZED  AUXILIARY & GOUIPMENT  AUXILIARY & GOUIPME					, ,	_		_	
AUXILIARY EQUIPMENT  DATE  AUXILIARY EQUIPMENT  DATE  AUXILIARY EQUIPMENT  DATE  AUXILIARY EQUIPMENT  DATE  AUXILIARY EQUIPMENT  TEST (7, 34, 5)  DATE  DATE  AUXILIARY EQUIPMENT  TEST (7, 34, 5)  DATE  DA					OL	0	0	$\circ$	
Document No.: 700-DAS-A4-RE-0048  TEST (7.3.4.5)  TEST (7.3.4.5)  AA INSPECTION (7.1.4)  (Note 5)  SHOP INSPECTION (7.1.4)  SHOP INSPECTION (7.1.4)  PER EN 13445  PER EN 13445  PER EN 13445  PER EN 13445  PER ASME V III  VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1.0)  VENDOR SUBMIT TEST PROCEDURES (7.3.1.2.19.2.5)  CASTING REPAIR PROCEDURE APPROVAL REO D (5.12.2.5)  MAG PARTICLE  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)  MAG PARTICLE  INSPECTION REQUIRED FOR CASINGS (7.2.1.3.7.5.1.2.1.5)  MAG PARTICLE  INSPECTION REQUIRED FOR CASINGS (7.2.1.3.7.5.1.2.1.5)  MAG PARTICLE  INSPECTION REQUIRED FOR CASINGS (7.2.1.3.7.5.1.2.1.5)  MAG PARTICLE  ADDITIONAL SUBSURFACE EXAMINATION FOR 7.2.1.3  REMARKS  DOCUMENT NO.: 700-DAS-A4-RE-0048  REMARKS  DOCUMENT NO.: Type: DAS	- 1			, ,	NT	$\circ$	$\bigcirc$	$\bigcirc$	
AND INSPECTION (7.1.4) (Note 5)  SHOP INSPECTION (7.1.4) (Note 5)  PER FORMANCE CURVE APPROVAL  TEST WITH SUBSTITUTE SEAL (7.3.3.2B)  MATERIAL CERTIFICATION REQUIRED (5.12.1.8)  MATERIAL CERTIFICATION REQUIRED (5.12.1.8)  CASING MIPELLER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS  CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  MAG PARTICLE LUQID PENETRANT  MAG PARTICLE LUGID						Ŭ	_	0	
## SHOP INSPECTION (7.1.4) (Note 5)    SHOP INSPECTION (7.1.4) (Note 5)   PERROMANCE CURVE APPROVAL   PERROMANCE CURVE APPROVAL   PERROSMACC CURVE APPROVAL   PERROSME V III	26	QA INSPECTION AND TESTING		, ,	12.4.3)	0	0	0	
### TEST WITH SUBSTITUTE SEAL (7.3.3.2B)  ### ACTION REQUIRED (5.12.1.8)  ### CASING   IMPELLER   SHAFT   SHAFT   SHAFT    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS    ### OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL	27	SHOP INSPECTION (7.1.4) (Note 5)		O PER EN 13445					
MATERIAL CERTIFICATION REQUIRED (5.12.1.8)  O CASING O CASING OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS  O OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS  O CASTING REPAIR PROCEDURE APPROVAL REQ D (6.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)  MAG PARTICLE O LIQUID PENETRANT RADIOGRAPHIC O HARDNESS TEST REQUIRED FOR CASINGS (7.2.1.3/5.1.2.1.5)  ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3  FOR METHOD  REMARKS  DOCUMENT NO.: 700-DAS-A4-RE-0048  REW.: 0  Owner Job No.:  Type: DAS	28	O PERFORMANCE CURVE APPROVAL		O PER ASME V III					
OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS  OCASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)  MAG PARTICLE  LIQUID PENETRANT  RADIOGRAPHIC  HULTRA SONIC  ADDITIONAL, SUBSURFACE EXAMINATION FOR 7.2.1.3  FOR  METHOD  REMARKS  DOCUMENT NO.: 700-DAS-A4-RE-0048  Rev.: 0  Owner Job No.:  VENDOR SUBMIT TEST PROCEDURES (7.3.12/9.2.5)  VENDOR SUBMIT TEST PROCEDURES (7.3.12/9.2.5)  VENDOR SUBMIT TEST PROCEDURES (7.3.12/9.2.5)  VENDOR SUBMIT TEST PROCEDURES (7.3.1.2/9.2.5)  VENDOR SUBMIT TEST PROCEDURES (7.3.1.2/9.2.5)  VENDOR SUBMIT TEST PROCEDURES (7.3.1.2/9.2.5)  VENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  ADDITION CHECK LIST (7.1.6)  WENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.1.2)  VENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.1.2)  VENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.1.2)  VENDOR SUBMIT EST DATA WITHIN 24 HOURS (7.3.1.2)  VEND	29	TEST WITH SUBSTITUTE SEAL (7.3.3.2B)	0			0	0	$\circ$	
OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS  CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (1.2.3.4e)  MAG PARTICLE  ILQUID PENETRANT  RADIOGRAPHIC  ULTRA SONIC  HARDNESS TEST REQUIRED:  ADDITIONAL SUBSURFACE EXAMINATION FOR 7.2.1.3  FOR  METHOD  Document No.: 700-DAS-A4-RE-0048  Rev.: 0  Owner Job No.:  VENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  SUBMIT INSPECTION CHECK LIST (7.1.6)  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)  WENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3E)  INCLUDE PLOTTED VIBRATION SPECTRA  SUBMIT INSPECTION CHECK LIST (7.1.6)	30	MATERIAL CERTIFICATION REQUIRED (5.12.1.8)		VENDOR KEEP REPA	AIR AND HT R	ECORDS (	7.2.1.10	;)	
CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)  INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)  MAG PARTICLE  LIQUID PENETRANT  RADIOGRAPHIC  INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)  MAG PARTICLE  LIQUID PENETRANT  ADDIOGRAPHIC  ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3  FOR  METHOD  REMARKS  Document No.: 700-DAS-A4-RE-0048  Rev.: 0  Owner Job No.:  Type: DAS	31	CASING IMPELLER SHAFT		VENDOR SUBMIT TE	ST PROCEDU	JRES (7.3.1	1.2 / 9.2.	5)	
SUBMIT INSPECTION REQUIRED FOR CONNECTION WELDS (5.12.3.4e)  MAG PARTICLE LIQUID PENETRANT RADIOGRAPHIC ULTRA SONIC HARDNESS TEST REQUIRED: ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3 FOR METHOD  REMARKS  REMARKS  Document No.: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS	32	OTHER SHAFT SLEEVES, INTERNAL WEARING RINGS, MECH. SEAL PARTS	_  0	VENDOR SUBMIT TE	ST DATA WIT	HIN 24 HO	URS (7.	3.3.3E)	
MAG PARTICLE   LIQUID PENETRANT   RADIOGRAPHIC   ULTRA SONIC   USINES (7.2.1.3 / 5.1.2.1.5)   USPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.3)   USPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.3)   USPECTION REQUIRED FOR CASINGS (7.2.2.3)	33	CASTING REPAIR PROCEDURE APPROVAL REQ D (5.12.2.5)	ΙŌ	INCLUDE PLOTTED V	IBRATION SI	PECTR/A			
RADIOGRAPHIC ULTRA SONIC INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5) MAG PARTICLE CLIQUID PENETRANT RADIOGRAPHIC ULTRA SONIC  HARDNESS TEST REQUIRED: ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3 FOR METHOD  REMARKS  REMARKS  DOCUMENT NO.:: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS	34			SUBMIT INSPECTION	CHECK LIST	(7.1.6)			
INSPECTION REQUIRED FOR CASINGS (7.2.1.3 / 5.1.2.1.5)  MAG PARTICLE   LIQUID PENETRANT   RADIOGRAPHIC   ULTRA SONIC    HARDNESS TEST REQUIRED: (7.2.2.3)  ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3    FOR METHOD   REMARKS    REMARKS    44  45  REMARKS    46  47  48  49  50  51  51  DOCUMENT NO.: 700-DAS-A4-RE-0048   Rev.: 0    Owner Job No.: Type: DAS									
MAG PARTICLE LIQUID PENETRANT RADIOGRAPHIC ULTRA SONIC HARDNESS TEST REQUIRED: ADDITIONAL SUBSURFACE EXAMINATION FOR 7.2.1.3 FOR METHOD  REMARKS  REMARKS  Document No.: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS									
39   RADIOGRAPHIC   ULTRA SONIC   HARDNESS TEST REQUIRED : (7.2.2.3)									-
40 HARDNESS TEST REQUIRED: (7.2.2.3) 41 ADDITIONAL SUBSURFACE EXAMINATION FOR 7.21.3 42 FOR (7.2.2.4) 43 METHOD (7.2.2.4) 44 FOR (7.2.2.5) 45 POR (7.2.2.5) 46 POR (7.2.2.5) 47 POR (7.2.2.5) 48 POR (7.2.2.6) 49 POR (7.2.2.6) 49 POR (7.2.2.6) 40 POR (7.2.2.6) 41 POR (7.2.2.6) 42 POR (7.2.2.6) 43 POR (7.2.2.6) 44 POR (7.2.2.6) 45 POR (7.2.2.6) 46 POR (7.2.2.6) 47 POR (7.2.2.6) 48 POR (7.2.2.6) 49 POR (7.2.2.6) 40 POR (7.2.2.6) 41 POR (7.2.2.6) 42 POR (7.2.2.6) 42 POR (7.2.2.6) 43 POR (7.2.2.6) 44 POR (7.2.2.6) 45 POR (7.2.2.6) 46 POR (7.2.2.6) 47 POR (7.2.2.6) 48 POR (7.2.2.6) 49 POR (7.2.2.6) 40 POR (7.2.2.6) 41 POR (7.2.2.6) 42 POR (7.2.2.6) 43 POR (7.2.2.6) 44 POR (7.2.2.6) 45 POR (7.2.2.6) 46 POR (7.2.2.6) 47 POR (7.2.2.6) 48 POR (7.2.2.6) 49 POR (7.2.2.6) 49 POR (7.2.2.6) 40 POR (7.2.2.6) 40 POR (7.2.2.6) 41 POR (7.2.2.6) 42 POR (7.2.2.6) 42 POR (7.2.2.6) 42 POR (7.2.2.6) 43 POR (7.2.2.6) 44 POR (7.2.2.6) 45 POR (7.2.2.6) 46 POR (7.2.2.6) 47 POR (7.2.2.6) 48 POR (7.2.2.6) 49 POR (7.2.2.6) 40 POR (7.2.2.6) 41 POR (7.2.2.6) 42 POR (7.2.2.6) 4									
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FOR METHOD REMARKS  REMARKS  REMARKS  Document No.: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS			'						
43 METHOD  44									
45 REMARKS 46 47 48 49 50 50 51 52 53 Document No.: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS									
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47 48 49 50 51 52 53  Document No.: 700-DAS-A4-RE-0048 Rev.: 0  Owner Job No.: Type: DAS	45	RE	MARKS						
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	55		Docum	ent No.: 700-DA	S-A4-RE-(	0048	F	Rev.: 0	
			Owner	Job No.:			一,	Γγρe: DA	S



- Note 1: ALL ELECTRICAL MOTORS SHALL BE IN ACCORDANCE WITH "TECHNICAL SPECIFICATION FOR LV MOTOR" DOC.No.900-SPC-A4-EE-0005 MOTOR ENCLOSURES SHALL BE OF TOTALLY ENCLOSED FAN-COOLED (TEFC)
- Note 2: TYPE OF PROTECTION SHALL BE Aexd
- Note 3: MECHANICAL SEAL SHALL BE AS PER API 682 / ISO 21049 3rd EDITION :2004. VENDOR SHALL FILL OUT API 682 (3rd ED.) DATA SHEET FOR MECHANICAL SEALS.
- Note 4: VENDOR IS REQUIRED TO REVIEW AND CONFIRM.
- Note 5: REFERE TO "INSPECTION & TEST PLAN FOR CENTRIFUGAL PROCESS PUMPS" DOC.No.: 900-ITP-A4-RE-0001.
- Note 6: ALLOWABLE LOAD AND MOMENTS ON NOZZLES AND FLANGES SHALL BE AS PER ISO STANDARD
- Note 7: SPECIAL TOOLS SHALL BE SUPPLIED BY VENDOR IF REQUIRED FOR PRE-COMMISIONNING, COMMISIONING, START-UP AND MAINTANANCE PERIOD.
- Note 8: NPSH REQUIRED FOR SELECTED PUMP SHALL BE AT LEAST 1 METER LESS THAN NPSHA.
- Note 9: DESIGN TEMPRATURE RANGE IS: -50 /180 °C. ALSO DESIGN PRESSURE IS: 10 Barg.
- Note 10: DRY, FLEXIBLE, MULTI DISK, S.S MEMBRANE SPACER TYPE COUPLING SHALL BE USED.

  DRIVER HALF COUPLING SHALL BE MOUNTED BY PUMP MFR.
- note11: Ex-group: ExdIIBT4
- Note 12: REFERE TO "UTILITY CONDITION" DOC.No.: 900-SPC-A4-PR-0006.

Document No.: 700-DAS-A4-RE-0048	Rev.: 0
Owner Job No.:	Type: DAS
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PROJECT: PP-PE PILOT PLANT	280°
DOC. TITLE :	شرکت ملی صنایع پنروشیمی شرکت پژوهش و فناوری پنروشیمی
DATA SHEET FOR CWS PUMP	Page 1 Of 5

#### **DATA SHEET FOR CWS PUMP**

0	2021-12-29	K.A	M.N	AA.SH	IFA
Rev.	Date	Prepared By	Checked By	Approved By	Status

PROJECT: PP-PE PILOT PLANT	ن کرکت ملی صدایع پذر و شنیمی شر کت پژو هش و فغاوری پنر و شنیمی شر کت پژو هش و فغاوری پنر و شنیمی
DOC. TITLE:	سرحت پرومس و هاوری پتروسیمی
DATA SHEET FOR CWS PUMP	Page 2 Of 5

#### **REVISION SHEET**

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	DOC. TIT		ATA SHEET FOR C	CWS PUMP				شرکت ملی صنایع شرکت پژوهش و فناو		
	,						Pag	e 3 Of 5		
APPLICABLE TO: Proposal SITE: PP-PE PILOT PLANT SERVICE: CWS PUMP TYPE: CENTRIFUGAL			PURCHASE	AS-BUILT  EQUIP TAG No.: .DRIVER TYPE M  VENDOR:			QTY. M	MAIN/SPARE : 1		
	00504	TING CONDITION F	4 OU DUMD	VENDOR:		<u> </u>				
	OPERA	TING CONDITION, E	ACH PUMP			BB68665	PERFORMA			
	ORM <b>225</b> i liq.	MAX	ITT. LIQUID:	COOLING W	ATER	SPEED NPSH REC	D CURVE No. 4-5F 1450 rpm 2 2.0 m CY 76 %	S5624		
DISCHARGE @ RATED CO	NDITION	5.5 bara @ 0.0 barg	NORM. FLOW			RATED PC		66.0 Kw 75.0 Kw		
SUCTION MIN / NORMAL / MAX DIFFERENTIAL PRESSURE AT (RATE	D)	5.5 bar					D IMPELLER 7			
·	002 bara RMAL / MIN	50/17/0 998	NPSHA 4 m °C			MIN CONT THERMAL	INUOUS FLOW RA 75.0 m³/h I COUPLING END			
VISCOSITY AT NORMAL TEMPERATURE		1.002	kg/m³ cP				PRESSURE	6.6 barg		
HYDRAULIC POWER 45 CAUSE OF CORROSION / EROSION	Kw	ded solid	TOVIC	☐ YES ■	NO					
CAUSE OF CORRUSION / ERUSION	Suspen	CONSTRUCTION	TOXIC	□ YES ■	NO					
NOZZLES SUCTION	SIZE 150	RATING 150#	FACING <b>RF</b>	LOCATION END	7					
DISCHARGE	100	150#	RF	TOP	+					
					_		SHOP TE	STS		
CASE - MOUNT ☐ CENTRE LI - SPLIT ☐ AXIAL ■ RADIAL TYPE		F(		BRACKET			NON WIT PERF	☐ WIT PERF		
	arg °(		NGLE DOUBLE /DROTEST 30	barg OC	EK		NON WIT HYDRO			
- CONNECTION	Ē	DRAIN	PRESSURE GAUGE				SHOP INSPECTION	N		
IMPELLER DIA. ■ RATED  TYPE CLOSED	434 mm	■ MAX ELLERS <b>ONE</b>	<b>169</b> mm					PECT AFTER TEST		
TYPE CLOSED  MOUNT BETWEEN BEAR	No. OF IMPE		OVERHUNG				OTHER			
BEARING TYPE RADI			THRUST ANTI-FF	RICTION			MATERIA	AL		
LUBRICATION ■ RING OIL COUPLING TYPE / MFR FLEX	☐ FLO	OD OI	L MIST IFLINGE	R PRESSU	JRE	CASII IMPE		CAST IRON BRONZE		
COUPLING TYPE / MFR FLEX BASE PLATE	IBLE ☐ SEPARA	ATE	■ COMMON WITH	l DRIV.			WEAR RINGS	CAST IRON		
DRIVER HALF SUPPLIED BY	■ PUMP N	MFR □ DF	RIVER MFR [	PURCHASER			LLER WEAR RINGS			
☐ PACKING: MFR & TYPE  ■ MECH SEAL: MFR & MODEL ■	DADA	SI	ZE/ No. OF RINGS API CLASS CODE	11		SHAF	VE SEAL	AISI 4140 N.A.		
		7.1.1.02.100.0052			THRO		N.A.			
MFR CODE	BARA					GLAN	ID	N.A.		
	,	AUXILIARY PIPING								
☐ CW PIPE PLAN ☐ CU	,	s □ss	☐ TUBING ☐	PIPE D.D		LANT	ERN RING	N.A. ST-37-2		
☐ CW PIPE PLAN ☐ CU☐ TOTAL COOLING WATER REQ.D☐ PACKING COOLING INJECTION RE	<i>,</i>	s □ss	☐ TUBING ☐ SIGHT FLOW IND REG m³/h bar	Q.D		LANT		N.A.		
☐ CW PIPE PLAN ☐ CU☐ TOTAL COOLING WATER REQ.D☐ PACKING COOLING INJECTION RE☐ EXTERNAL SEAL FLUSH FLUID	☐ C Q'D TOTAL	S	□ TUBING □ SIGHT FLOW IND REG m³/h bar barg SEAL FI			LANT	ERN RING	N.A.		
☐ CW PIPE PLAN ☐ CU☐ TOTAL COOLING WATER REQ.D☐ PACKING COOLING INJECTION RE	<i>,</i>	S	☐ TUBING ☐ SIGHT FLOW IND REG m³/h bar	Q.D		LANT	ERN RING	N.A.		
☐ CW PIPE PLAN ☐ CU☐ TOTAL COOLING WATER REQ.D☐ PACKING COOLING INJECTION RE☐ EXTERNAL SEAL FLUSH FLUID☐ AUXILIARY SEAL PIPE	☐ C Q'D TOTAL	S	□ TUBING □ SIGHT FLOW IND REC m³/h bar barg SEAL FI JBING □ PIPE	Q.D		LANT BASE	ERN RING PLATE WEIGH	N.A. ST-37-2 T		
☐ CW PIPE PLAN ☐ CU☐ TOTAL COOLING WATER REQ.D☐ PACKING COOLING INJECTION RE☐ EXTERNAL SEAL FLUSH FLUID☐ AUXILIARY SEAL PIPE	☐ C Q'D TOTAL	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	□ TUBING □ SIGHT FLOW IND REG m³/h bar barg SEAL FI	Q.D	1	LANT	ERN RING PLATE WEIGH	N.A. ST-37-2 T		
CW PIPE PLAN CU TOTAL COOLING WATER REQ.D PACKING COOLING INJECTION RE EXTERNAL SEAL FLUSH FLUID AUXILIARY SEAL PIPE AUXILIARY SEAL QUENCH FLUID  KW RPM	☐ C Q'D TOTAL	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	TUBING SIGHT FLOW IND REC m³/n bar barg SEAL FI BING PIPE  ELECTRIC MOTOR 75.0 1450	Q.D		PUMF MOTO	ERN RING PLATE  WEIGH OD OR INE N.A.	N.A. ST-37-2 T kg kg kg		
□ CW PIPE PLAN □ CU □ TOTAL COOLING WATER REQ.D □ PACKING COOLING INJECTION RE □ EXTERNAL SEAL FLUSH FLUID □ AUXILIARY SEAL PIPE □ AUXILIARY SEAL QUENCH FLUID  KW	Q'D TOTAL CS	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	□ TUBING □ SIGHT FLOW IND REC m³/h bar barg SEAL FI BING □ PIPE  ELECTRIC MOTOR 75.0	Q.D		PUMF MOTO	ERN RING PLATE  WEIGH OD OR INE N.A.	N.A. ST-37-2 T kg kg		
CW PIPE PLAN CU TOTAL COOLING WATER REQ.D PACKING COOLING INJECTION RE EXTERNAL SEAL FLUSH FLUID AUXILIARY SEAL PIPE AUXILIARY SEAL QUENCH FLUID  KW RPM MFR VOLT/PH/	Q'D TOTAL CS	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	TUBING SIGHT FLOW IND REC m³/h bar barg SEAL FI JBING PIPE  ELECTRIC MOTOR 75.0 1450 VEM	Q.D		PUMF MOTO TURE ENGI	ERN RING PLATE  WEIGH OD OR INE N.A.	N.A. ST-37-2 T kg kg kg kg		
CW PIPE PLAN CU TOTAL COOLING WATER REQ.D PACKING COOLING INJECTION RE EXTERNAL SEAL FLUSH FLUID AUXILIARY SEAL PIPE AUXILIARY SEAL QUENCH FLUID  KW RPM MFR VOLT/PH/	Q'D TOTAL CS	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	TUBING SIGHT FLOW IND REC m³/h bar barg SEAL FI JBING PIPE  ELECTRIC MOTOR 75.0 1450 VEM	Q.D		PUMF MOTO TURE ENGI	ERN RING PLATE  WEIGH OD OR INE N.A.	N.A. ST-37-2 T kg kg kg kg		
□ CW PIPE PLAN □ CU □ TOTAL COOLING WATER REQ.D □ PACKING COOLING INJECTION RE □ EXTERNAL SEAL FLUSH FLUID □ AUXILIARY SEAL PIPE □ AUXILIARY SEAL QUENCH FLUID  KW RPM MFR VOLT/PH/	Q'D TOTAL CS	S ☐ SS m³/h ☐ m³/h ☐ SS ☐ TU	TUBING SIGHT FLOW IND REC m³/h bar barg SEAL FI JBING PIPE  ELECTRIC MOTOR 75.0 1450 VEM	Q.D		PUMF MOTO TURE ENGI	ERN RING PLATE  WEIGH OD OR INE N.A.	N.A. ST-37-2 T kg kg kg kg		

## Ebara End Suction Volute Pump

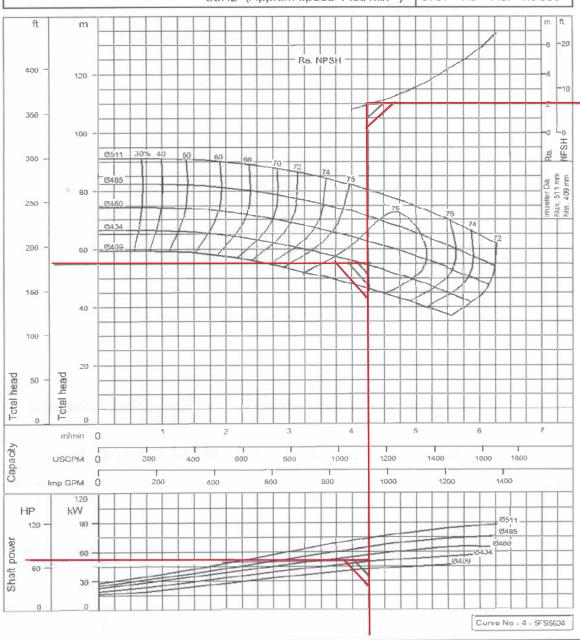
Model FSA

Performance Curve 4 Poles (20/27)

#### 150 x 100 FS4NA

According to ISO testing code 2548 Class C

50Hz (Approx. speed 1450 min ') | S.G.= 1.0 Vis.= 1.0 cSt





TD56FS5405

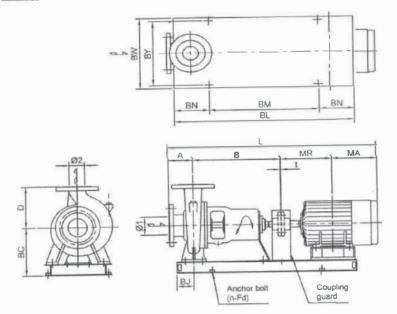
## Ebara End Suction Volute Pump

## Model FSA

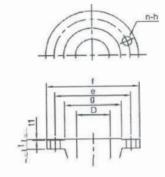
Dimension - Pump With Motor (16 Bar Model) 4 Poles Drive

50 Hz

#### Pump



#### <u>Flange</u>



Dimension - Flance (JIS 16K RF) f mm 100 225 185 160 2 23 150 305 260 230 2 200 350 305 275 2 30 12 250 430 380 345 2 12 27

Dimension - Pump (Steel baseplate)

min Cou	Motor	Si	ze	d ī	Pu	mp	file	i Ou	Mol	or		2			(	Commo	on Bas	50					Total	_
Model	kW	φl	<b>\$2</b>	A	В	D	wt kg	Frame	MR	MA	wt kg	вс	BJ	BL	BM	BN1	BN2	BY1	BY2	n-Fd	wt kg	t	L	W kg
150x100 FSNA	55 75 90	150	100	180	670	450	365	250SC 250MC 280SC	482.5		520 580 660	525	130	1500 1530 1600	2x600 2x615 2x650	150	150	580	640	6-M20	156 170 175	4	1736.5 1774.5 1876	,
200x150 FSLA	75 90	200	150	162	670	450	336	250MC 280SC		**********	580 660	465	130	1530 1600	2x615 2x650	150	150	580	640	6-M20	150 145	4	1756.5 1858	11
200x150 FSNA	110 132	200	150	182	670	560	488	280MC 315SC 315MC	589	527	720 920 1030		130	1670 1680 1730	*********	150	150	580 650		6-M20 6-M22	176 200 220	4	1928 1972 2023	10
250x200 FSLA	90 110 132	250	200	180	670	560	505	280SC 280MC 315SC 315MC	569 5 589	502.5 527	660 720 920 1030		185	1730 1740 1790	2x705	4.05	165	690	760	6-M22	250 255 235 240	4	1926 1970 2021	1:
250x200 FSNA	185 225 260 300 335	250	200	200	200	820	630		741.0	1116	1070 1800 2400 2700	610	185		2x945 2x975	175	175			6-M22		5	2191 2881 3004 3194 3250	3

TD56FS1029



	44			[	OCUME	NT NUME	ER
	280		SAZ CATALYST PLANT				
N Petr	ational Petrochemical Company ochemical Research & Technolo	r ogy	PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0
1	Company		P-6014				
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 44 45 46 47 48 49 50 50 50 50 50 50 50 50 50 50 50 50 50		DA	ATASHEET FOR PUIV	1P 60	014		
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F S	ISSUE		DESCRIPTION	DRAWN UP	VERIFIE	APROVED	DATE

	4		DOCUMENT NUMBER
	S	AZ CATALYST PLANT	BOCOMENT NOMBER
	<u>್ಲಿನಿಸ್</u>	PROCESS DATA SHEET	1
	National Petrochemical Company		SHEET N. 2 OF 3 ISSUE 0
Petroca	emical Research & Technology Company	P-6014	
1	SERVICE HOT WATER PUMP		QUANTITY <b>1</b>
2	TYPE CENTRIFUGAL		PLANT UNIT 600
3	INSTALATION OUTDOOR	SERVICE TYPE CONTINUOUS	INCLUDED IN
4	SUMP DATA <b>m</b>		
5	ORIENTATION HORIZONTAL	DEPTH	MIN.SUMB.
6	AREA CLASSIFICATION	CLASS DIVISION	GROUP
7		PROCESS DATA	
8	PUMPED LIQUID	HOT WATER	
9	SUSPENDED SOLID	NO % BY WT	
10	SOLID NATURE		
	PARTICLE	SIZE mu DENSITY	kg/m³
12	PUMPING TEMPERATURE(PT) (°c)	NOR. <b>100</b> MAX.	130 AT MIN. PT 50
13	DENSITY (kg/m³)	AT NOR.PT 1080 AT MAX PT	AT MIN. PT
14	VISCOSITY (mpa s)	AT NOR.PT 1.854 AT MAX PT	
15	VAPOR PRESSURE (bar)	AT NOR.PT 0.52 AT MAX PT	
16	CAPACITY (m³/h)	RATED 20	MIN
	SUCTION PRESSURE (barg)	RATED 2	MAX 4
18	DISCHARGE PRESSURE (barg)	RATED 5	
19	` ′	RATED	
20		RATED	
21	` '	AVAILABLE 7.5	REQUIRED
22			
23		BODY	
	DESIGN PRESSURE (barg)	COND.1 <b>10</b> COND.2	F.V.REQUIRED <b>YES</b>
	DESIGN TEMPERATURE (°C )	COND.1 160 COND.2	F.V TEMP
	MDMT @	@	
27		C.S	
28		TYPE MATERIAL C.S	,
	COLLIN/HEATING	REQUIRED FLUID	
30	(*** 0)	NORMAL MAX.  NORMAL MAX.	
32		SEAL	
33		Double mechanical seal	PLAN 01
	FLUSHING	REQUIRED FLUID	1511
	PRESSURE (barg)	NORMAL MAX.	
	TEMPERATURE(°C)	NORMAL MAX.	-
37	• 1	DN RATING	FACING
38	3	NOZZLE	
39	SUCTION FLANGE	2½" RATING <b>150</b> #	FACING RF
40	DISCHARGE FLANGE	2" RATING <b>150</b> #	FACING RF
41	VENT	DN RATING	FACING
42	DRAIN	DN RATING	FACING
43	DRIVER	TYPE ELECTRIC (Ex-T4) IP55	
44		ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
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National Petrochemical Company Petrochemical Research & Technolog	PROCESS DATA SHEET	SHEET N. 3 OF 3 ISSUE 0
Company	P-6014	•
	ER PUMP	QUANTITY 1 PLANT UNIT 600
3		PLANT UNIT 600
4	NOTE	
5 GENERAL NOTES:		
7		
8		
9 DATA SHEET NOTES: 10 APPLICABLE OVERLAY	TANDARD(S) : API 610 (10TH EDITION)	
11	TANDARD(S) . AFT 010 (10TH EDITION)	
12 13		
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	2820		SAZ CATALYST PLANT				
Na Petro	ational Petrochemical Company ochemical Research & Technolo	r ogy	PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0
1	Company		P-7013				
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 48 49 50 50 50 50 50 50 50 50 50 50 50 50 50		DA	ATASHEET FOR PUN	1P 70	013		
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		4	A T CATALLYST DI ANIT	DOCUMENT NUMBER
			SAZ CATALYST PLANT	
		918 No	PROCESS DATA SHEET	
		ational Petrochemical Company		SHEET N. 2 OF 3 ISSUE 0
Petro	cher	mical Research & Technology Company	P-7013	5.122.11.2 0. 5 1.0002 0
-	1	SERVICE <b>NaOH</b>		QUANTITY <b>1</b>
	2	TYPE CENTRIFUGAL		PLANT UNIT 700
	3	INSTALATION OUTDOOR	SERVICE TYPE CONTINUOUS	INCLUDED IN
	-	SUMP DATA m	SERVICE THE CONTINUOUS	INCEOSES IN
	5	ORIENTATION HORIZONTAL	DEPTH	MIN.SUMB.
		AREA CLASSIFICATION	CLASS DIVISION	GROUP
	7	THE TOTAL STATE OF THE TOTAL STA	PROCESS DATA	dicoi
- ⊢	-	DUMANEN HOLIIN	NaOH	
_	_	PUMPED LIQUID		
	-	SUSPENDED SOLID	NO % BY WT	
	_	SOLID NATURE		
	_	PARTICLE	SIZE mu DENSITY	kg/m³
	_	PUMPING TEMPERATURE(PT) (°c )	NOR. <b>20</b> MAX.	40 AT MIN. PT
		DENSITY (kg/m³)	AT NOR.PT 880 AT MAX PT	AT MIN. PT
	_	VISCOSITY (mpa s)	AT NOR.PT 0.43 AT MAX PT	
	_	VAPOR PRESSURE (bar)	AT NOR.PT AT MAX PT	
1	L6	CAPACITY (m³/h)	RATED 2	MIN
		SUCTION PRESSURE (barg)	RATED 0	MAX 1
1	L8	DISCHARGE PRESSURE (barg)	RATED 3	
1	19	DIFFERENTIAL PRESSURE (bar)	RATED	
2	20	MANOMETRIC HEAD	RATED	
2	21	NPSH (m)	AVAILABLE 4.9	REQUIRED
2	22	PERFORMANCE HEAD		
2	23		BODY	
2	24	DESIGN PRESSURE (barg)	COND.1 6 COND.2	F.V.REQUIRED YES
	_	DESIGN TEMPERATURE (°C )	COND.1 <b>100</b> COND.2	F.V TEMP
	_	MDMT @	@	
_	_	MATERIAL (IN CONTACT WITH LIQUID)	SS	
2	_	IMPELLER	TYPE MATERIAL SS	
2	-	COLLIN/HEATING	REQUIRED FLUID	-
	_	PRESSURE (barg)	NORMAL MAX.	
	-	TEMPERATURE °C	NORMAL MAX.	-
	32		SEAL	
3	33	TYPE	Double mechanical seal with seal pot	PLAN 52
3	34	FLUSHING	REQUIRED FLUID	
_	_	PRESSURE (barg)	NORMAL MAX.	
		TEMPERATURE(°C )	NORMAL MAX.	
	_	RATING AND FACING	DN RATING	FACING
	38		NOZZLE	
		SUCTION FLANGE	1" RATING <b>150</b> #	FACING RF
4	10	DISCHARGE FLANGE	¾" RATING <b>150</b> #	FACING RF
	_	VENT	DN RATING	FACING
	_	DRAIN	DN RATING	FACING
	_	DRIVER	TYPE ELECTRIC (Ex-T4) IP55	
	_	POWER	ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
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National Petrochemical Company Petrochemical Research & Technology		P-7013	SHEET N. 3 OF 3	ISSUE <b>0</b>
	ipany	P-7013		
1 SERVICE	NaOH		QUANTITY	1
3			PLANT UNIT	700
4		NOTE		
5				
6 GENERAL	NOTES:			
7				
9 PATA SHI				
40 DATA 3FI	EET NOTES:	DARDICA ADI CAO (AOTH EDITION)		
11	SLE OVERLAY STANI	DARD(S): API 610 (10TH EDITION)		
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4				DOCUMENT NUMBER			
National Petrochemical Company Petrochemical Research & Technology			SAZ CATALYST PLANT				
		у	PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0
Petro	ochemical Research & Technol Company	ogy	P-7021	SHEET IV.	1 0/3		1330E 0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 48 49 49 49 49 49 49 49 49 49 49 49 49 49		DA	ATASHEET FOR PUIV	1P 70	021		
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	4			DOCUMENT NUMBER	R
		AZ CATALYST PL	.ANT		-
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National Petrochemical Company Petrochemical Research & Technology Company				SHEET N. 2 OF 3 ISS	SUE 0
1011001	omean nessential a resimency company	P-7021		•	
1	SERVICE WAL			QUANTITY <b>1</b>	
2	TYPE <b>CENTRIFUGAL</b>			PLANT UNIT 700	
3	INSTALATION OUTDOOR	SERVICE TYPE CONTIL	NUOUS	INCLUDED IN	
4					
5		DEPTH		MIN.SUMB.	
6		CLASS	DIVISION	GROUP	
7		PROCESS DAT	Α		
8	1,1	WAL			
9		YES	% BY WT	0.5	
	SOLID NATURE	0.75	D.E.N.G.TTV	1 / 3	
	PARTICLE PUMPING TEMPERATURE(PT) (°c)	SIZE mu	DENSITY	kg/m³	50
	DENSITY (kg/m³)	NOR. 60 AT NOR.PT 860	MAX. AT MAX PT	70 AT MIN. PT AT MIN. PT	50
	VISCOSITY (mpa s)	AT NOR.PT 0.24	AT MAX PT	AT WIIN. FT	
	VISCOSITY (IIIpa's)  VAPOR PRESSURE (bar)	AT NOR.PT 0.24 AT NOR.PT 0.50	AT MAX PT		
16	<u> </u>	AT NOR.FT 0.30	RATED 4	MIN	
	SUCTION PRESSURE (barg)		RATED 4	MAX	1
	B DISCHARGE PRESSURE (barg)		RATED 4	IVIAA	
19			RATED		
	MANOMETRIC HEAD		RATED		
2:		AVAILABLE 6	MAILE	REQUIRED	
22	` '	AVAILABLE		negomes	
23		BODY			
	DESIGN PRESSURE (barg)		OND.2	F.V.REQUIRED	YES
	DESIGN TEMPERATURE (°C )		OND.2	F.V TEMP	123
	MDMT @	@			
2	<b>- </b>	C.S			
28		TYPE	MATERIAL CS		
29	COLLIN/HEATING	REQUIRED	FLUID		
30		NORMAL	MAX.		
31		NORMAL	MAX.		
32	2	SEAL			
33		Double mechanical seal wi	ith seal pot	PLAN	52
_	FLUSHING	REQUIRED	FLUID		
	PRESSURE (barg)	NORMAL	MAX.		
	TEMPERATURE(°C)	NORMAL	MAX.		
37		DN	RATING	FACING	
38		NOZZLE 1½" RA	ATING 150#	FACING	DE
	DISCHARGE FLANGE		ATING <b>150#</b> ATING <b>150#</b>	FACING FACING	RF RF
	VENT		ATING 150# ATING	FACING	NF .
	DRAIN			FACING	
43		TYPE ELECTRIC (Ex-T4) IP55	ATING	FACING	
44		ABSORBED ESTIM.		MOTOR NOMINAL ESTIM.	
45		ABSORBED ESTIM.		WOTOR NOWINAL LITTIN.	
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	4	SAZ CATALYST PLANT	DOCUMENT NU	MBER
National Petrochemical Company				
		PROCESS DATA SHEET		
Petroche	emical Research & Technology Company	P-7021	SHEET N. 3 OF 3	ISSUE 0
		1-7021		
	ERVICE WAL		QUANTITY	1
2			PLANT UNIT	700
3		NOTE		
4		NOTE		
5	ENERAL NOTES:			
U	ENERAL NOTES.			
<u>7</u> 8				
9				
10	ATA SHEET NOTES:			
	DDLLCADLE OVEDLAV CTANE	AADDICA AADI CAA (AATII EDITION)		
12 A	PPLICABLE OVERLAY STANL	DARD(S): API 610 (10TH EDITION)		
13				
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<b>285</b>	SAZ CATALYST PLANT				
National Petrochemical Company Petrochemical Research & Technology Company	PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53	DATA FOR PUMP 7	7022			
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	46		DOCUMENT NUMBER
	S	AZ CATALYST PLANT	DOCCINETY NOWBER
918 kg		PROCESS DATA SHEET	₹
National Petrochemical Company			SHEET N. 2 OF 3 ISSUE 0
Petrochemical Research & Technology Company		P-7022	
1	SERVICE HEXANE		QUANTITY 1
2	TYPE <b>CENTRIFUGAL</b>		PLANT UNIT 700
3	INSTALATION OUTDOOR	SERVICE TYPE CONTINUOUS	INCLUDED IN
4	SUMP DATA m		
5		DEPTH	MIN.SUMB.
6		CLASS DIVISION	GROUP
7		PROCESS DATA	
8		HEXANE	
9		NO % BY WT	
	SOLID NATURE		
	1 PARTICLE	SIZE mu DENSITY	kg/m³
	PUMPING TEMPERATURE(PT) (°c )	NOR. 40 MAX.	70 AT MIN. PT <b>40</b>
	DENSITY (kg/m³)	AT NOR.PT 850 AT MAX PT	AT MIN. PT
	VISCOSITY (mpa s)	AT NOR.PT 0.24 AT MAX PT	
	VAPOR PRESSURE (bar)	AT NOR.PT 0.35 AT MAX PT	
	6 CAPACITY (m³/h) 7 SUCTION PRESSURE (barg)	RATED 2	
	B DISCHARGE PRESSURE (barg)	RATED 0	MAX 1
1	- · · · · · · · · · · · · · · · · · · ·	RATED	
	MANOMETRIC HEAD	RATED	
2		AVAILABLE 5.9	REQUIRED
2	. ,	71711211322 313	The Control
2		BODY	
	4 DESIGN PRESSURE (barg)	COND.1 6 COND.2	F.V.REQUIRED YES
	DESIGN TEMPERATURE (°C )	COND.1 100 COND.2	F.V TEMP
	6 MDMT @	@	
2	MATERIAL (IN CONTACT WITH LIQUID)	C.S	
2	8 IMPELLER	TYPE MATERIAL C	s
2	OCLLIN/HEATING	REQUIRED FLUID	
3	PRESSURE (barg)	NORMAL MAX.	
3		NORMAL MAX.	
3		SEAL	
	TYPE	Double mechanical seal with seal pot	PLAN 52
	FLUSHING	REQUIRED FLUID	
	5 PRESSURE (barg) 6 TEMPERATURE(°C)	NORMAL MAX.  NORMAL MAX.	
3	- Your Control of the	DN RATING	FACING
3		NOZZLE	TACING
3		1" RATING <b>150</b> #	FACING RF
	D DISCHARGE FLANGE	3/4" RATING <b>150</b> #	FACING RF
	1 VENT	DN RATING	FACING
4	2 DRAIN	DN RATING	FACING
4	3 DRIVER	TYPE ELECTRIC (Ex-T4) IP55	
4	4 POWER	ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
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National Petrochemical Company Petrochemical Research & Technology Company	P-7022	SHEET N. 3 OF 3 ISSUE 0	
Company	P-7022	<u> </u>	
1 SERVICE HEXANE		QUANTITY 1	
2		PLANT UNIT 700	
3			,
4	NOTE		
5			
6 GENERAL NOTES:			
7			
8			
DATA SHEET NOTES:			
APPLICABLE OVERLAY STANI	DARD(S) : API 610 (10TH EDITION)		
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14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33			
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4				DOCUMENT NUMBER		
TA.	26	SAZ CATALYST PLANT				
National Petrochemi Petrochemical Researc		PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0
Compan		P-8012				
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 50 50 50 50 50 50 50 50 50 50 50 50		ATASHEET FOR PU	JMP 80	012		
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			DOCUMENT NUMBER
	S	AZ CATALYST PLANT	BOCOMENT NOMBER
64 B 16		PROCESS DATA SHEET	<del>1</del>
National Petrochemical Company			SHEET N. 2 OF 3 ISSUE 0
Petrochemical Research & Technology Company		P-8012	3HEET N. 2 OF 3 1330E 0
1 1	SERVICE HEXANE		QUANTITY <b>1</b>
2			PLANT UNIT 800
<u> </u>		SERVICE TYPE CONTINUOUS	INCLUDED IN
4	+	SERVICE TIPE CONTINUOUS	INCLUDED IN
5		DEPTH	MIN.SUMB.
-		CLASS DIVISION	GROUP
H		PROCESS DATA	dicor
1		HEXANE	
9		NO % BY WT	
	SOSPENDED SOLID  SOLID NATURE	NO % BY WI	
		CIZE	1/3
	1 PARTICLE 2 PUMPING TEMPERATURE(PT) (°c)	SIZE mu DENSITY	kg/m³
		NOR.         40         MAX.           AT NOR.PT         850         AT MAX PT	70 AT MIN. PT <b>40</b> AT MIN. PT
	DENSITY (kg/m³)		AT WIN. PT
	VISCOSITY (mpa s)	AT NOR.PT 0.24 AT MAX PT	
	VAPOR PRESSURE (bar)	AT NOR.PT 0.45 AT MAX PT	D AINI
1	. , ,	RATED 4	MIN
	7 SUCTION PRESSURE (barg) B DISCHARGE PRESSURE (barg)	RATED 0	MAX 1
		RATED 4	
1	` '	RATED	
	MANOMETRIC HEAD	RATED	DEOLUBED
2	` '	AVAILABLE 5.9	REQUIRED
2		1	
2		BODY	
2	DESIGN PRESSURE (barg)	COND.1 6 COND.2	F.V.REQUIRED YES
	DESIGN TEMPERATURE (°C )	COND.1 100 COND.2	F.V TEMP
	MDMT @	@	
2	, ,	C.S	
2		TYPE MATERIAL CS	
	OCULIN/HEATING	REQUIRED FLUID	
3	(*** 6)	NORMAL MAX.	
3		NORMAL MAX.	
3		SEAL  Double mechanical seal with seal pot	DIAN E2
3	TYPE  FLUSHING		PLAN 52
		·	
	5 PRESSURE (barg) 6 TEMPERATURE(°C )	NORMAL MAX.  NORMAL MAX.	
3		DN RATING	FACING
3	· · · · · · · · · · · · · · · · · · ·	NOZZLE KATING	FACING
3		1½" RATING <b>150</b> #	FACING RF
	D DISCHARGE FLANGE	1" RATING 150#	FACING RF
	1 VENT	DN RATING	FACING
	2 DRAIN	DN RATING	FACING
4		TYPE ELECTRIC (Ex-T4) IP55	FACING
4		ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
4		ABSORBED ESTIMI.	MOTOR NOMINAL ESTIM.
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4	SAZ CATALYST PLANT	DOCUMENT NUMBER
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National Petrochemical Company	PROCESS DATA SHEET	
Petrochemical Research & Technology  Company	P-8012	SHEET N. 3 OF 3 ISSUE 0
Company	F-0012	
1 SERVICE HEXANE		QUANTITY 1
2		PLANT UNIT 800
3		
4	NOTE	
5		
6 GENERAL NOTES:		
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11	DARD(S) : API 610 (10TH EDITION)	
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• <del>•</del>			SAZ CATALYST PLANT	DOCUMENT NUMBER			
Pe	National Petrochemical Company trochemical Research & Technolo Company	gy	PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE <b>0</b>
1 2 3 4 5 6 7 8 9 9 10 11 12 13 13 14 15 16 17 18 19 20 21 22 23 33 34 35 36 37 38 39 40 41 42 45 46 46 47 47 48 48 49 49 49 49 49 49 49 49 49 49 49 49 49	-	D	ATASHEET FOR PUN	1P 80	021		
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	46		DOCUMENT NUMBER
		SAZ CATALYST PLANT	BOCOMENT NOMBER
918 kg		PROCESS DATA SHEET	1
National Petrochemical Company			SHEET N. 2 OF 3 ISSUE 0
Petro	chemical Research & Technology Company	P-8021	
	1 SERVICE HEXANE		QUANTITY <b>1</b>
	2 TYPE CENTRIFUGAL		PLANT UNIT 800
	3 INSTALATION OUTDOOR	SERVICE TYPE CONTINUOUS	INCLUDED IN
	4 SUMP DATA m		
	5 ORIENTATION HORIZONTAL	DEPTH	MIN.SUMB.
	6 AREA CLASSIFICATION	CLASS DIVISION	GROUP
	7	PROCESS DATA	
	8 PUMPED LIQUID	HEXANE	
	9 SUSPENDED SOLID	NO % BY WT	
1	10 SOLID NATURE		
1	11 PARTICLE	SIZE mu DENSITY	kg/m³
	12 PUMPING TEMPERATURE(PT) (°c)	NOR. 25 MAX.	70 AT MIN. PT <b>25</b>
	13 DENSITY (kg/m³)	AT NOR.PT 850 AT MAX PT	AT MIN. PT
_	14 VISCOSITY (mpa s)	AT NOR.PT 0.24 AT MAX PT	
	15 VAPOR PRESSURE (bar)	AT NOR.PT 0.40 AT MAX PT	
	16 CAPACITY (m³/h)	RATED 2	MIN
1	17 SUCTION PRESSURE (barg)	RATED 0	MAX 1
	18 DISCHARGE PRESSURE (barg)	RATED 4	
	19 DIFFERENTIAL PRESSURE (bar)	RATED	
1	MANOMETRIC HEAD	RATED	
1	21 NPSH (m)	AVAILABLE 5.9	REQUIRED
12	22 PERFORMANCE HEAD		
- 1-	23	BODY	
	24 DESIGN PRESSURE (barg)	COND.1 6 COND.2	F.V.REQUIRED YES
1	25 DESIGN TEMPERATURE (°C )	COND.1 100 COND.2	F.V TEMP
	26 MDMT @	@	
	27 MATERIAL (IN CONTACT WITH LIQUID)	C.S	
- 1-	28 IMPELLER	TYPE MATERIAL CS	
	29 COLLIN/HEATING	REQUIRED FLUID	
	30 PRESSURE (barg)	NORMAL MAX.	
	31 TEMPERATURE °C	NORMAL MAX.	
	32	SEAL	
3	33 TYPE	Double mechanical seal with seal pot	PLAN 52
3	34 FLUSHING	REQUIRED FLUID	
[	PRESSURE (barg)	NORMAL MAX.	
3	<b>36</b> TEMPERATURE(°C )	NORMAL MAX.	
3	<b>37</b> RATING AND FACING	DN RATING	FACING
3	38	NOZZLE	
	SUCTION FLANGE	1" RATING <b>150</b> #	FACING RF
4	<b>40</b> DISCHARGE FLANGE	¾" RATING <b>150</b> #	FACING RF
4	41 VENT	DN RATING	FACING
4	42 DRAIN	DN RATING	FACING
4	43 DRIVER	TYPE ELECTRIC (Ex-T4) IP55	
4	<b>44</b> POWER	ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
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4	SAZ CATALYST PLANT	DOCUMENT NUMBER
€285°	PROCESS DATA SHEET	4
National Petrochemical Company		CUESTAL 2 OF 2 ISSUE 0
Petrochemical Research & Technology Company	P-8021	SHEET N. 3 OF 3 ISSUE 0
1 SERVICE HEXANE	-	QUANTITY 1
2		PLANT UNIT 800
3		TEANT ONLY
4	NOTE	
5	11012	
6 GENERAL NOTES:		
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	DARD(S) : API 610 (10TH EDITION)	
11	DAKD(S) . API 610 (10TH EDITION)	
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National Petrochemical Company Petrochemical Research & Technology Company			PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE <b>0</b>
Petr	Company	gy	P-8022	511221111			
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 44 45 46 47 48 49 50 50 50 50 50 50 50 50 50 50 50 50 50		D#	ATASHEET FOR PUN	1P 80	022		
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Pot		ational Petrochemical Company mical Research & Technology Company					SHE	ET N. 2 OF 3	ISSUE 0	
1 011	ocner	inter Research & Technology Company	Ρ.	-802	<b>4 2</b>			•		
	1	SERVICE HEXANE FEED PU	MP					QUAN	тітү 1	
ľ	2	TYPE CENTRIFUGAL						PLANT	UNIT <b>800</b>	
	3	INSTALATION OUTDOOR	SERVI	CE TYPE	DISCO	NTINUOUS	6	INCLU	DED IN	
	4	SUMP DATA <b>m</b>								
	5	ORIENTATION HORIZONTAL	DE	PTH					MIN.SUMB.	
	6	AREA CLASSIFICATION	CL	ASS		DIVISI	ON		GROUP	
ļ	7			PRO	CESS DA	TA				
L	8	PUMPED LIQUID	HEXANE		HAZ	ARDOUS	NESS			
	9	SUSPENDED SOLID	NO			% BY \	WT			
	10	SOLID NATURE								
	11	PARTICLE	SIZE		mu	DENS	ITY		kg/m³	
	12	PUMPING TEMPERATURE(PT) (°c )	NOR.AMB	20		MAX	Κ.	37	AT MIN. PT	
L	13	DENSITY (kg/m³)	AT NOR.PT	660		AT MA	X PT	640	AT MIN. PT	
	14	VISCOSITY (mpa s)	AT NOR.PT	0.32		AT MA	X PT			
	15	VAPOR PRESSURE (bar)	AT NOR.PT	0.16		AT MA	X PT			
	16	CAPACITY (m³/h)				RATEI	D <b>1</b> 5	;	MIN	
	17	SUCTION PRESSURE (barg)				RATEI	D <b>0</b>		MAX	0.5
	18	DISCHARGE PRESSURE (barg)				RATEI	D 4			
	19	DIFFERENTIAL PRESSURE (bar)				RATE	D 4			
	20	MANOMETRIC HEAD				RATEI	D			
	21	NPSH (m)	AVAILABLE	6.5	5				REQUIRED	
L	22	PERFORMANCE HEAD								
	23				BODY					
	24	DESIGN PRESSURE (barg)	COND.1	10	(	COND.2			F.V.REQUIRED	YES
	25	DESIGN TEMPERATURE (°C )	COND.1	100	(	COND.2			F.V TEMP	
	26	MDMT @	@							
	27	MATERIAL (IN CONTACT WITH LIQUID)	C.S							
	28	IMPELLER	TYPE			MATERIA	L C	.s		
	29	COLLIN/HEATING	REQUIRED			FLUI	D			
	30	PRESSURE (barg)	NORMAL			MAX	Κ.			
	-	TEMPERATURE °C	NORMAL			MAX	Κ.			
ŀ	32				SEAL					
	-	TYPE	1	nechanio	cal seal v	with seal p			PLAN	52
ŀ	-	FLUSHING	REQUIRED			FLUI				
ŀ		PRESSURE (barg)	NORMAL			MAX				
-		TEMPERATURE(°C)	NORMAL			MAX			540000	
ŀ	_	RATING AND FACING	DN		VO771 F	RATII	NG		FACING	
	38	CUCTION FLANCE	2.1/2"	ı	NOZZLE	DATING 1	150#		FACING	D.F.
ŀ	39 40	SUCTION FLANGE DISCHARGE FLANGE	2 1/2" 2"			RATING 1	L50#		FACING FACING	RF RF
ŀ	_						150#			Kr
-	-	VENT DRAIN	DN			RATING			FACING	
ŀ	-		DN	DIC (F.		RATING			FACING	
-	-	DRIVER		RIC (Ex-	14) 1255			NAOTO	DD NIONAINIAI ECTINA	
ŀ	44 45	POWER	ABSORBED	ESTIM.				MOTO	OR NOMINAL ESTIM.	
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National Petrochemical Company Petrochemical Research & Technology	PROCESS DATA SHEET	SHEET N. 3 OF 3 ISSUE 0
Company	P-8022	31122114. 3 01 3 13302 0
1 SERVICE HEXANE FEED P	UMP	QUANTITY 1
2		PLANT UNIT 800
3 4	NOTE	
5	NOTE	
6 GENERAL NOTES:		
7		
DATA SHEET NOTES:		
	DARD(S) : API 610 (10TH EDITION)	
10 " ROW 8: (FLUID HAZARDOL	JSNESS) - TOXIC; FLAMMABLE.	
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	National Petrochemical Company Petrochemical Research & Technology Company		SAZ CATALYST PLANT							
			PROCESS DATA SHEET	SHEET N.	1 OF 3		ISSUE 0			
1	Company		P-9022							
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 43 44 45 46 47 48 49 50 50 50 50 50 50 50 50 50 50		DA	ATASHEET FOR PUIV	1P 90	022					
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	4		DOCUMENT NUMBER
	S	AZ CATALYST PLANT	DOCOMENT NOMBER
	6485e	PROCESS DATA SHEET	<del>1</del>
	National Petrochemical Company		SHEET N. 2 OF 3 ISSUE 0
Petroc	hemical Research & Technology Company	P-9022	3HEET N. 2 OF 3 1330E 0
1 1	SERVICE HEXANE		QUANTITY <b>1</b>
1 2			PLANT UNIT 900
3		SERVICE TYPE CONTINUOUS	INCLUDED IN
-		SERVICE THE CONTINUOUS	INCLUDED IN
5		DEPTH	MIN.SUMB.
1		CLASS DIVISION	GROUP
H		PROCESS DATA	dicor
1	-	HEXANE	
9		NO % BY WT	
	O SOLID NATURE	76 B1 W1	
		CIZE	050 1-7-3
	1 PARTICLE	SIZE mu DENSITY	850 kg/m³
	PUMPING TEMPERATURE(PT) (°c)	NOR. 25 MAX.	40 AT MIN. PT <b>25</b>
	DENSITY (kg/m³)	AT NOR.PT 850 AT MAX PT	AT MIN. PT
	VISCOSITY (mpa s)	AT NOR.PT 0.24 AT MAX PT	
	VAPOR PRESSURE (bar)	AT NOR.PT 0.20 AT MAX PT	
1	` ' '	RATED 15	MIN
	SUCTION PRESSURE (barg)	RATED 0	MAX 1
	DISCHARGE PRESSURE (barg)	RATED 4	
1	` ′	RATED	
	MANOMETRIC HEAD	RATED	
2	` '	AVAILABLE 5.1	REQUIRED
2			
2		BODY	
2	DESIGN PRESSURE (barg)	COND.1 6 COND.2	F.V.REQUIRED <b>YES</b>
	DESIGN TEMPERATURE (°C )	COND.1 70 COND.2	F.V TEMP
2	MDMT @	@	
2	7 MATERIAL (IN CONTACT WITH LIQUID)	C.S	
2	8 IMPELLER	TYPE MATERIAL <b>CS</b>	
2	9 COLLIN/HEATING	REQUIRED FLUID	
3	(11.0)	NORMAL MAX.	
3		NORMAL MAX.	
3		SEAL	
3		Double mechanical seal with seal pot	PLAN 52
	4 FLUSHING	REQUIRED FLUID	
	PRESSURE (barg)	NORMAL MAX.	
	6 TEMPERATURE(°C)	NORMAL MAX.	
3		DN RATING	FACING
3		NOZZLE	
3		2½" RATING <b>150#</b>	FACING RF
	DISCHARGE FLANGE	2" RATING <b>150</b> #	FACING RF
	1 VENT	DN RATING	FACING
	2 DRAIN	DN RATING	FACING
4		TYPE ELECTRIC (Ex-T4) IP55	
4		ABSORBED ESTIM.	MOTOR NOMINAL ESTIM.
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National Petrochemical Company Petrochemical Research & Technology	PROCESS DATA SHEET	SHEET N. 3 OF 3 ISSUE 0
Company	P-9022	STREET IV. 5 OF 5 ISSUE 5
1 SERVICE HEXANE		QUANTITY 1
3		PLANT UNIT 900
4	NOTE	
5	-	
6 GENERAL NOTES:		
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DATA SHEET NOTES:		
11 APPLICABLE OVERLAY STAN	DARD(S) : API 610 (10TH EDITION)	
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**Spare Parts** 

Description	Qty.
Shaft (with key)	1 pc
Impeller	1 pc
Shaft Sleeve	2 pcs
Gasket & O-Ring	2 sets
Mechanical Seal	2 pcs
Bearing	2 sets
Wear Ring	2 sets

PROJECT: PP-PE PILOT PLANT

Title: Inspection and Test Plan for Centrifugal Process
Pumps

Client:

Client:

Client:

شرکت ملی صنایع پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

شرکت پژوهش و فناوری پتروشیمی

# INSPECTION & TEST PLAN FOR CENTRIFUGAL PROCESS PUMPS

Document No.: 900-ITP-A4-RE-0001	Rev.: 0
Owner Job No.:	Type : ITP
Contract Job No.:	Page A

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Client:

شرکت ملی صنایع پتروشیمی شرکت پژوهش و فناوری پتروشیمی

Title: Inspection and Test Plan for Centrifugal Process Pumps

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No.  1 2 3 4 5 6 7 8 9 10 11	Inspection/Test Items  Pre-inspection meeting required for above 100 Kw  Mill test reports  Material identification and markings  Material test certificate in accordance with "Engineering Specification for Centrifugal Process Pumps"  Material compliance certificate for gaskets, valves, piping items, etc.  Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications  RT,UT,MT or PT( Review of all radiographs ) ( Note 1) ( * )	Standards Relevant Spec. Relevant material Spec. Approved procedure and drawings Approved procedure Approved procedure Approved procedure and drawings Approved procedure and drawings Approved procedure and drawings Approved procedure Approved procedure	X R S R R R R R	P X R S R R R	V X R M M M M	X X X X
2 3 4 5 6 7 8 9	Mill test reports  Material identification and markings  Material test certificate in accordance with "Engineering Specification for Centrifugal Process Pumps"  Material compliance certificate for gaskets, valves, piping items, etc.  Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Relevant material Spec.  Approved procedure and drawings  Approved procedure  Approved procedure  Approved procedure and drawings  Approved procedure and drawings  Approved procedure and drawings	R S R R R R	R S R R S	R M M M	X X X
3 4 5 6 7 8 9	Material identification and markings  Material test certificate in accordance with "Engineering Specification for Centrifugal Process Pumps"  Material compliance certificate for gaskets, valves, piping items, etc.  Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure Approved procedure Approved procedure Approved procedure and drawings Approved procedure and drawings Approved procedure and drawings Approved procedure Approved procedure	R R R S	S R R R	M M M	X X X
4 5 6 7 8 9	Material test certificate in accordance with "Engineering Specification for Centrifugal Process Pumps"  Material compliance certificate for gaskets, valves, piping items, etc.  Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure  Approved procedure  Approved procedure and drawings  Approved procedure and drawings  Approved procedure  Approved procedure	R R S R	R R R	M M M	X X
5 6 7 8 9	Specification for Centrifugal Process Pumps"  Material compliance certificate for gaskets, valves, piping items, etc.  Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure Approved procedure and drawings Approved procedure and drawings Approved procedure Approved procedure and drawings	R R S	R R S	M M	X
6 7 8 9	Manufacture's test certificate/calibration certificate for instruments  Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure and drawings Approved procedure and drawings Approved procedure Approved procedure and drawings	R S R	R S	M	-
7 8 9 10	Storage of materials and welding consumables  Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure and drawings  Approved procedure  Approved procedure and drawings	S R	S		X
8 9 10	Sub order verification for Bought out items like drivers, piping etc.  Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure Approved procedure and drawings	R		M	
9	Inspection of Bought out items at sub vendor's works for drivers, piping etc.  Non-destructive testing personal qualifications	Approved procedure and drawings		n		
10	piping etc. Non-destructive testing personal qualifications		p	R	M	X
$\vdash$	Non-destructive testing personal qualifications	A	1/	R	M	X
11	RT,UT,MT or PT( Review of all radiographs ) ( Note 1) ( * )	Approved Qualification Certificate	R	R	M	
-		Approved procedure	R	R	M	X
12	Execution of major repairs, NDE after repair (Note 3)	Approved procedure and drawings	Н	Н	M	X
13	Welder Qualifications for pressure casing (records or welder's list) Note: If inspector doubt welder's ability Inspector may requested welder for new qualification test	R	R	M	X	
14	Weld preparation and fit-up (Note 3)	Approved procedure and drawings	S	S	M	X
15	Workman ship, Cleanliness	Approved procedure and drawings	S	S	M	
16	Heat treatment execution (If applicable) ( ** )	R	R	M	X	
17	Adherence to approved procedures (welding, heat treatment, etc)	S	S	M	X	
18	Adherence to agreed inspection plan	S	S	M		
19	Balancing test	R	R	M	X	
20	Visual and dimensional inspection at assembled condition before performance test	W	W	M	X	
21	Clearance and run out test (If applicable)	R	R	M	X	
22	Hydrostatic test of casing and barrel	Н	Н	M	X	
23	Pneumatic test for casing (when specified)	W	W	M	X	
24	Performance test ( Note 2 )	Н	Н	M	X	
25	Mechanical running test with vibration and bearing temperature measurement ( Note 2 ) $ \\$	Approved procedure	Н	Н	M	X
26	Dismantling inspection for casing internal, sleeve type bearings after test run (when specified) $(***)$	No defect shall be observed	W	W	M	X
27	NPSH test (when NPSHA-NPSHR is less than 1.0 m.) (Note 2)	Н	Н	M	X	
28	Motor test (when provided) Note: Inspection and witness is required for drivers of 175 Kw and above. Inspection (but no witnessing) is required for drivers below 175Kw	w	w	M	X	
29	Hydrostatic test of lube oil unit, when provided	W	W	M	X	
30	Shop running test for lube oil unit, when provided	Approved procedure and drawings	W	W	M	X
31	Visual (cleanliness) and dimensional inspection for lube oil unit after run test	s	s	M	X	
32	Sound level test	Approved procedure	Н	Н	M	X
33	Installation of wiring and conduit (ex proof examination if required)	Approved procedure and drawings	s	s	M	X
34	Other test as specified	Approved procedure and drawings	W	W	M	X
35	Surface preparation prior to painting , coating, lining	Approved procedure and drawings	s	s	M	

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#### Title: Inspection And Test Plan for Centrifugal Process **Pumps**



شركت ملى صنايع پتروشيمي
شرکت پژوهش و فناوری پتروشیمی

36	Painting, Coating, Lining ,preservation, Pickling and Passivating	Approved procedure and drawings	S	S	M	X
37	Dimensional check of skid, location of lifting lugs, location of anchor bolts.	Approved procedure and drawings	S	S	M	X
38	Function, setting and calibration of instruments and controls	Approved procedure and drawings	R	M	X	
39	Aux. Items check (spare parts, glands, cables, etc)	Approved procedure and drawings	S	S	M	
40	Name plate, tagging, marking	Approved procedure and drawings	S	S	M	
41	Final visual inspection	Approved procedure and drawings	W	Н	M	
42	Controlling spare parts of equipment	Approved procedure and drawings	R	S	M	
43	Preparation for shipment	Approved procedure and drawings	Н	Н	M	
44	Documentation review prior to release	Approved procedure and drawings	R	R	M	X

Note 1 : According to engineering spec. for Centrifugal Process Pumps.

Note 2 : Required test shall be done for all pumps, but witness is required for one per same item.

Note 3: Shall be done as per approved WPS/PQR.

Note 4: This is only a indicative ITP and vendor shall prepare a detailed ITP in line with above and specific technical requirement of applicable design code.

Note 5 : Vendor shall ensure that all test and measuring instruments are duty calibrated and calibration shall be valid at the time of inspection.

Note 6 : Pump drivers shall be inspected at manufactures shop as per relevant inspection & test plan. Note 7: No shipment of goods may be effected unless an "Inspection relevant certificate" has been submitted to seller

- Inspector may request to witness the test.
- \*\* Inspector may request to witness the execution.
- \*\*\*- Mechanical seal will not be dismantled after the test run. In case it is needed it will be discussed case by case.

#### **Abbreviation:**

W: Witness P: Purchaser M: Vendor's inspection and test

O: Owner R: Review of documents H: Hold Point

> S: Witness, but spot check X: Required

V: Vendor basis

C: Certificate/Data to be provided by Vendor

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#### TITLE: TECHNICAL SPECIFICATION FOR LV MOTOR

### TECHNICAL SPECIFICATION FOR LV MOTOR

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# TITLE: TECHNICAL SPECIFICATION FOR LV MOTOR

# CONTENTS

- 1. GENERAL
- 2. DESIGN CHARACTERISTICS
- 3. QUALITY ASSURANCE AND PREPARATION FOR SHIPMENT

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#### TITLE: TECHNICAL SPECIFICATION FOR LV MOTOR

#### 1. GENERAL

# SCOPE

- 1.1.1 This specification covers the minimum requirements for design, construction, inspection and testing of industrial type low voltage, 50 Hz squirrel cage induction motors for PP&PE PILOT PLANT of Research and Technology Center of petrochemical Co. Arak, Iran..
- 1.1.2 The scope covers motors for use in class I Divisions 1 & 2, or equivalent, in classified areas and also for general purpose industrial use in safe areas. The motors are mainly intended for centrifugal pump drives, cooling fans and compressors.
- 1.1.3 Detailed specific design requirements for each motor or group of motors are given in Data Sheets.

#### 1.2 STANDARDS & CODES

- 1.2.1 All motors shall generally be designed, manufactured and tested in accordance with the latest edition of International Electrotechnical Commission (IEC) standard and Iranian Petroleum Standard(IPS).
- 1.2.2 Metric SI system of units shall be applied to all dimensions and relevant documents.

#### 1.3 LANGUAGE

1. All correspondences and submittals shall be in English.

#### 1.4 SITE CONDITIONS

The equipment and all its components shall be entirely suitable for the site conditions specified as below:

1.4.1 Temperature

a) Max. ambient temperature	44°C
b) Min. ambient temperature	-28°C
c) Design temperature for outdoor equipment	50°C

d) Equipment exposed to sunlight 83°C

1.4.2 Relative humidity Max. 86% in Jan.

1.4.3 Altitude above sea level 1889 m

1.4.4 Wind velocity Max. 120 Km/h

1.4.5 Seismic factor In acc. With zone 3 of UBC

1.4.6 Special atmosphere Dusty & corrosive

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#### 1.5 DOCUMENTS PRIORITY

In the event of any conflict between this specification, the data sheets, drawings, codes and standards, the priority shall be given in the following order.

- a) Purchase order
- b) Data sheets and/or drawings
- c) This specification
- d) Codes and standards

In any case vendor shall refer the matter with purchaser and obtain clarification before proceeding with any work.

#### 2. <u>DESIGN CHARACTERISTICS</u>

#### 2.1 RATING AND APPLICATION

2.1.1 Voltage and output rating shall be:

RATING	VOLTAGE	PHASE
Below 0.25 KW	230 V	1
0.25 KW and above	400 V	3

- 2.1.2 Performance duty of motors shall be "S1" according to IEC 34-1, unless stated otherwise.
- 2.1.3 All equipment covered by this specification shall be designed for severe duty outdoors, totally unprotected from weather unless otherwise specified and for use in a corrosive atmosphere. Motor frames shall be cast iron or steel. Aluminum frames are not acceptable.
- 2.1.4 Motor driving compressors and reciprocating pumps shall be sized so that the product of the motor name plate rating and the motor service factor shall be at least 110% of the greatest horsepower required (including gear and etc.) for any of the compressor and reciprocating pump operating conditions.
- 2.1.5 Motors driving centrifugal pumps shall have horsepower rating at least equal to the following percentage of pump design point brake horsepower:

Motor Rating (KW)	Percent of Pump BHP	
18.5 and less	125	
22 to 55	115	
75 and above	110	

#### 2.2 SUPPLY VARIATIONS

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Motors shall be capable of operating continuously at their rated torque under the above conditions at any frequency between minus 2% and plus 2% of the nominal frequency together with any voltage between minus 10% and plus 10% of the nominal rating.

#### 2.3 STARTING CONDITIONS

- 2.3.1 Unless otherwise specified, motors shall be designed for direct-on-line starting.
- 2.3.2 Motors shall be capable of two normal starts in succession under the above conditions with the motor at normal running temperature, also a minimum of 3 starts/hour, equally spaced, during normal running conditions.
- 2.3.3 Starting characteristics shall meet the requirements of IEC 34-12.
- 2.3.4 The pull up torque at nominal volts shall not be less than 0.5 times the locked rotor torque and not less than 0.5 times the rated load torque for motors rated less than 100 KW.
- 2.3.5 For motors rated 100 KW and above, the pull up torque at nominal volts shall not be less than 0.5 times the locked rotor torque and not less than 0.3 times the rated load torque.
- 2.3.6 Motors shall be able to overcome starting load inertia as well as accelerating the load to rated speed under both rated and at 20% reduced voltage conditions during starting without injurious heating.
- 2.3.7 When motors are furnished separately or with the driven equipment as a package, the torque characteristics and speed specified shall be the responsibility of the driven equipment vendor.
- 2.3.8 Unless otherwise specified, all motors are for coupled service.

#### 2.4 ENCLOSURE

- 2.4.1 Unless otherwise specified, all motor enclosures shall be of Totally Enclosed Fan-Cooled (TEFC) construction. For outdoor use shall additionally be weatherproof without further protection and equivalent to IP 54 per IEC 34-5.
- 2.4.2 Motor enclosures shall be suitable for the area classification in which they are to be installed.
- 2.4.3 For general purpose use in class I Div.1 classified areas all motors to be explosion-proof flameproof.
- 2.4.4 For general purpose use in class I Div. 2 classified areas all motors to have type of protection "e" (increased safety) or "n" (non-sparking).
- 2.4.5 All single phase motors in classified areas shall be explosion-proof.
- 2.4.6 All motors specified suitable for classified areas shall be certified by an approved and official certifying agency/authority such as UL, FM, BASEEFA, etc.
- 2.4.7 The maximum surface temperature class in classified areas shall be as stated in the Data Sheets
- 2.4.8 Outdoor motors shall be rated for continuous operation under the direct sunlight.

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- 2.4.9 Where specified in Data Sheets, anti-condensation space heaters for use on 230 V single phase, 50 Hz shall be provided. Terminations are to be brought-out to a cable box separate from the main power lead cable box.
- 2.4.10 All motors shall be provided with means for preventing the accumulation of moisture inside the motor.
- 2.4.11All motors exceeding 20 kg in weight shall be equipped with suitable lifting eyes.

#### 2.5 COOLING

- 2.5.1 Unless otherwise specified, method of cooling shall be totally Enclosed Fan Cooled (TEFC) and to be suitable for either direction of rotation of the motor. On motors with unidirectional fans, the direction of rotation shall be clearly and permanently marked by an arrow on the non driving end.
- 2.5.2 The flow direction of the external air shall be from the non-driving end.
- 2.5.3 Fans for motors shall be of brass, bronze or aluminium. Aluminium alloy fans shall not contain more than 0.2% copper. Fans shall be inherently balanced.
- 2.5.4 Plastic, fiberglass or other non-metallic fans are not acceptable.

#### 2.6 STATOR WINDINGS

- 2.6.1 The motor windings shall be braced to prevent any excessive movement during transportation and all operating conditions.
- 2.6.2 Windings of three phase motors up to and including 75 KW shall be connected in delta. Winding of motors larger than 75 KW shall have six winding ends brought out to the terminal box for either delta or star connection.
- 2.6.3 Aluminum stators are not acceptable.

#### 2.7 INSULATION AND TEMPERATURE RISE LIMITS

- 2.7.1 The stator windings shall be fully insulated for an unearthed system.
- 2.7.2 Unless otherwise specified, the insulation shall be class F according to IEC-85. The temperature rise as measured by increase in resistance method shall not exceed 80 °C for all type of motors, based on 50 °C maximum ambient shade temperature and maximum continuous rating.
- 2.7.3 The method of application and details of the insulating material shall be clearly stated in Vendor proposal documents.
- 2.7.4 All windings shall have a tropicalised finish or have an extra insulation coating (double dip and bake).

#### 2.8 ROTOR

2.8.1 Rotors shall be free of inherent axial thrust. They shall be statically and dynamically balanced.

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a. With full driven key

01

- b. With motor half couplings keyed on the shaft.
- 2.8.2 Except for motors ordered as spares or replacements, supply of half couplings or pulleys will be in the responsibility of the driven machines manufacturer and shall be delivered rough or pilot bored to the motor manufacturer to finish bore, fit and balance.
- 2.8.3 Balancing by means of lead or other unstable material is not acceptable. If solder is used, it shall have a melting point not less than 185°C.
- 2.8.4 Rotor bars shall be securely located in their slots throughout their length.
- 2.8.5 Brazed copper or copper alloy cage construction is preferred for all rotors. However, cast aluminum rotor cages are acceptable as an alternative for all small motors with ratings up to and including 45 KW.

#### 2.9 BEARINGS AND LUBRICATION

- 2.9.1 For horizontally mounted motors, preferred types of bearing and lubrication are ball and roller with grease (lithium base).
- 2.9.2 For vertically mounted motors, bearing type and lubrication shall generally be as in clause 2.9.1 above except for larger machines vendor should put forward alternative proven design.
- 2.9.3 Grease lubricated bearings shall be packed with grease before dispatch.
- 2.9.4 Oil lubricated ball/roller bearings shall be provided with constant level oilers.
- 2.9.5 Fractional horsepower motors supplied with sealed pre-lubricated ball/roller bearings shall be factory sealed, long life type and trouble free guaranteed for five years normal operation under site condition.
- 2.9.6 The calculated life (ISO B10 "90% survival" under the estimated bearing loads) should comply with the following requirement:

Up to 75 KW 15000 hrs.

75 KW and above 25000 hrs.

#### 2.10 VIBRATION AND NOISE LEVELS

- 2.10.1 Motors at all speed should be balanced in accordance with the limits of vibration as per IEC 34-14.
- 2.10.2 Motor noise emission rate for the driven equipment shall not exceed the noise level specified in IEC 34-9.

#### 2.11 SHAFT AND FRAME SIZE

2.11.1 Shafts and frames shall be designed in accordance with IEC 34-7.

# 2.12 CABLE CONNECTION AND TERMINATION

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- 2.12.1Terminal boxes shall be located on the left hand side of the motor when viewed from the non-drive end and shall have means for entry from any of the four directions separated by 90°, vertical or horizontal.
- 2.12.2 An earthing terminal of the same capacity as the line terminal shall be fitted externally to the terminal box. Cable boxes are to be adequately designed to withstand internal faults. It may be assumed that all 400 V motors will be protected by MCCB's.
- 2.12.3It shall be possible in all forms of cable entry to withdraw the motor without breaking or stressing the seal or cable.
- 2.12.4Conduit entries are to be tapped ISO. Tapped entries on all motors shall provide not less than 5 full threads
- 2.12.5 Type and size of cables for the main supply, anti condensation heaters and P.T.C. detectors, where applicable, shall be as specified in Data Sheets. All cable boxes shall be equipped with necessary terminal blocks, cable lugs, explosion proof/weatherproof and corrosion resistant brass compression type cable glands to receive the incoming cables.
- 2.12.6 Terminal markings and phase rotation shall be "A-B-C" counter clockwise.
- 2.12.7All cable terminal boxes shall be made of steel or cast iron. All cover joints shall be fitted with gaskets of polychloroprene or like material to prevent the ingress of moisture and dust. The enclosure shall be suitable for the area classification in which it is to be installed and its degree of protection shall not be less than IP 55 to IEC.

# 2.13 THERMAL PROTECTION

2.13.1When specified in Data sheets single phase motors shall be fitted with an automatic reset thermal overcurrent device (T.O.C) in the interior of the motor.

The device shall be matched to the particular application and duty of the "drive" and to be ambient compensated for the highest temperature likely to be encountered inside the motor under site service condition. Motors thus fitted shall carry a warning plate, in English, stating that such a device is fitted and to isolate at the starter or control switch before approaching the motor.

2.13.2Where specified in Data Sheets, three phase motors shall be fitted with six thermal detectors, two per phase of the positive temperature coefficient (P.T.C) type adapted to the temperature rise of the winding and wired out to a separate terminal box.

Vendor shall supply the temperature/time relationship curve with the motor test certificate.

#### 2.14 RADIO INTERFERENCE

2.14.1Where specified in data sheets, motors shall be fitted with radio interference suppression device in compliance with B.S.800.

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#### 2.15 SERIAL NUMBER AND RATING PLATES

- 2.15.1 The serial number shall be stamped permanently on a non-removable part of the frame.
- 2.15.2Rating plates shall be stainless steel or alternatively of a non-corrosive alloy. They shall be fixed to a non-removable part of the frame and show:
  - Maker's name
  - Frame size and serial number
  - Class of rating (continuous or short time)
  - Type of protection, gas group(s), temp. class
  - · Class of insulation
  - Type of connection (star or delta)
  - Volts, phase, frequency
  - Output in KW at full power at tested temperature
  - Full load current and full load speed
  - Efficiency and power factor at full load
  - Type of enclosure (TEFC, other)
  - Type and size of bearings
  - Standards (IEC or other)
  - Purchase order No. and vear of ordering
  - Locked rotor torque in % FLT
  - Locked rotor current in % FLC
  - Net weight
  - Type of the Lubricant(Grease)
  - The lubrication period and the quantity of injection lubricant in every time
- 2.15.3 A separate nameplate shall be fixed to the frame indicating purchaser's tag number.

#### 2.16 FINISH

- 2.16.1Prepared surfaces shall be free from rust, scale, sand, dust and grease before painting.
- 2.16.2 Finish shall be suitable for highly corrosive and dusty environments.

#### 3. QUALITY ASSURANCE AND PREPARATION FOR SHIPMENT

# 3.1 INSPECTION

Purchaser reserves the right for inspection at any stage of manufacturing, testing or preparation for shipment. Purchaser inspection shall not relieve vendor of his commitments under the terms of purchase documents and this specification.

#### 3.2 ITP FORMS

The inspection and test plan (ITP) forms covers the minimum verifications, checks, and tests required for LV motors to comply with codes, specification, and/or contractual requirements.

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#### 3.3 PREPARATION FOR SHIPMENT

- 3.3.1 Unless otherwise specified, preparation for shipment shall be in accordance with the manufacturer's standard. The manufacturer shall be solely responsible for the adequacy of the preparation for shipment employed with respect to materials and applications, and provide materials to their commercial carrier systems.
- 3.3.2 Electric motors shall be shipped with bearings lubricated.
- 3.3.3 Silicagel or similar dehydrating compound shall be enclosed in each motor package. Vents shall be waterproof sealed.
- 3.3.4 Rotors shall be locked.

#### 3.4 GUARANTEE

Unless exception is recorded by Vendor in his proposal, it shall be understood that Vendor agrees to the guarantee terms described below:

All equipments and component parts shall be guaranteed by Vendor against defective material, design and workmanship when operated under normal condition for 12 months after being placed in specified service but not exceeding 18 months after date of shipment. If any mal-performance or defects occurs during the guarantee period, Vendor shall make available repaired, altered or replacement parts free of any charges whatsoever direct on the purchaser's job site. Vendor shall make available free of charge to the purchaser qualified representatives as he deems necessary to supervise the removal, repair and replacement of the defective parts in such manner that the guarantee be maintained.

The guarantee period for repaired or replaced parts shall be 12 months after start up of repaired equipment but not more than 18 months after the repaired parts and/or equipment are shipped. The guarantee period for the remaining equipment whose operation is dependent upon the proper performance of the repaired part shall be extended by the number of days of fraction thereof that the equipment had been inoperative because of defects. Field labor charges for works during the guarantee period shall be subjected to negotiation between purchaser and Vendor.

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# SPECIFICATION FOR PAINTING





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# **CONTENTS**

SCOPE

REFERENCE SPECIFICATION

**METEOROLOGICAL CONDITIONS ON SITE** 

**PAINT SYSTEM** 

**QUALITY CONTROL REQUIREMENTS** 

**GENERAL REQUIREMENTS** 

**COLOUR** 

**GUARANTEES** 





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# 1 SCOPE

The scope of this specification is the description of the Preparation and Painting Work for Piping Equipment, Supports, Fixed Roof Tanks, Machinery, main packages (supply as loose material), etc. to be carried out for the units covered by the subject job.

# 2 REFERENCE SPECIFICATIONS

# 2.1 International Specifications

- Standard ISO 8501-1: 1988
- European Scale of Rusting Degrees
- ASTM American Society for Testing and Material
- RAL 840 HR, RAL F2
- SSPC(Steel Structure Painting Council)

# 2.2 Particular Job Specification

SPC-JV-GA-E-60701

#### 3 METEOROLOGICAL CONDITIONS ON SITE

- Temperature : Min. -28°C

: Max. +40°C

- Relative Humidity : Min. 30%

: Max. 86%

- Type of environment: Industrial - Marine





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# 4 PAINT SYSTEMS

The various applicable paint systems are the following:

**4.1** Uninsulated carbon and alloy steel surfaces of Piping (pipes, fittings, flanges, valves), Supports, Equipment (vessels, exchangers, columns, etc.) and Tanks with operating temperature up to 70°C.

SYSTEM SYMBOL		22   04   F				
PREPARATION SYMBOL		F				
		Blast cleaning grade Sa 2½ as per Standard ISO 8501-1:1988 or as per SSPC VIS-2 degree SP 10. Bast cleaning profile 25÷ 30 microns				
ANTI CORROSION PRIMER	RSYMBOL	22				
	1st COAT	One coat of Ethyl Silicate Zinc-Rich with solvent. D.F.T. 75 microns				
FINISH SYMBOL		04				
Chlorinated	1st COAT	One coat of Pure Unsaponifiable				
		Rubber D.T.F. 40 microns				
	2nd COAT	One coat of Modified Alkyd Chlorinated Rubber D.T.F. 40 microns				
	TOTAL DRY FILM THICKNESS : 155 microns					

Note: Valves, Shop Fabricated Equipment primerized at Mfr's

shop, after erection and before finish coats application, shall be treated as follows:





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- wash-ups: The surface shall be washed with fresh water if the substrate has

been contaminated with chloride, powder etc, during its transpor-

tation, storage and erection.

The surface shall be washed with unchloride solvent, where

strictly necessary, to remote traces of grease, oil, etc.

- touch-ups: The surface shop primed having mechanical damages or rusting

(inclusive of weld seam), shall be prepared and treated by a powerful wire brushing to the degree St3 per Standard ISO 8501-1:

1988.

The touch-ups shall then be done, using two pack epoxy zinc-rich

primer in two coats, d.f.t. 30 µm for each coat.





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**4.2** Uninsulated carbon and alloy steel surfaces of Piping (pipes, fittings, flanges, valves) and Equipment (vessels, exchangers, columns, etc.) with operating temperature from 71°C to 200°C.

SYSTEM SYMBOL		22 31 F					
PREPARATION SYMBOL		F					
		Blast cleaning grade Sa 2½ as per Standard ISO 8501-1:1988 or as per SSPC VIS-1 degree SP 10. Bast cleaning profile 25÷ 30 microns					
ANTI CORROSION PRIME	R SYMBOL	22					
	1st COAT	One coat of Ethyl Silicate Zinc-Rich with solvent. D.F.T. 75 microns					
FINISH SYMBOL		31					
Paint	1st COAT	One coat of Acrylic Silicone Aluminium					
raiii		D.F.T. 25 microns					
Paint	2nd COAT	One coat of Acrylic Silicone Aluminium					
T diff.		D.F.T. 25 microns					
	TOTAL DRY	FILM THICNESS: 125 microns					

Note: Valves and Equipment primerized at Mfr's shop, after erection and before finish coats application, shall be treated as follows:





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- wash-ups: The surface shall be washed with fresh water if the substrate has

been contaminated with chloride, powder etc, during its transpor-

tation, storage and erection.

The surface shall be washed with unchloride solvent, where

strictly necessary, to remote traces of grease, oil, etc.

- touch-ups: The surface shop primed having mechanical damages or rusting

(inclusive of weld seam), shall be prepared and treated by a

powerful wire brushing to the degree St3 per Standard ISO 8501-1:

1988.

The touch-ups shall then be done, using two pack epoxy zinc-rich

primer in two coats, d.f.t. 30 µm for each coat.





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**4.3** Uninsulated carbon and alloy steel surfaces of Piping (pipes, fittings, flanges, valves) and Equipment (vessels, exchangers, columns, etc.) with operating temperature from 201°C to 400°C.

SYSTEM SYMBOL		22   32   F					
PREPARATION SYMBOL		F					
		Blast cleaning grade Sa 2½ as per Standard ISO 8501-1:1988 or as per SSPC VIS-1 degree SP 10. Bast cleaning profile 25÷ 30 microns					
ANTI CORROSION PRIME	ER SYMBOL	22					
	1st COAT	One coat of Ethyl Silicate Zinc-Rich with solvent. D.F.T. 75 microns					
FINISH SYMBOL		32					
Doint	1st COAT	One coat of Acrylic Silicone Aluminium					
Paint		D.F.T. 20 microns					
Paint	2nd COAT	One coat of Acrylic Silicone Aluminium					
i aiiit		D.F.T. 20 microns					
	TOTAL DRY	FILM THICNESS: 115 microns					

Note: Valves and Equipment primerized at Mfr's shop, after erection and before finish coats application, shall be treated as follows:





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- wash-ups: The surface shall be washed with fresh water if the substrate has

been contaminated with chloride, powder etc, during its transpor-

tation, storage and erection.

The surface shall be washed with unchloride solvent, where strictly necessary, to remote traces of grease, oil, etc.

- touch-ups: The surface shop primed having mechanical damages or rusting

(inclusive of weld seam), shall be prepared and treated by a powerful wire brushing to the degree St3 per Standard ISO 8501-1:

1988.

The touch-ups shall then be done, using ethyl silicate, zinc-rich

primer, d.f.t. 50-75 µm for each coat.





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**4.4** Hot and cold insulated carbon and alloy steel surfaces of Piping (pipes, fittings, flanges, valves) and Equipment (vessels, exchangers, columns, etc.) with operating temperature from -25 up to  $400^{\circ}$ C.

SYSTEM SYMBOL		22 01 F
PREPARATION SYMBOL		F
		Blast cleaning grade Sa 2½ as per Standard ISO 8501-1:1988 or as per SSPC VIS-1 degree SP 10. Bast cleaning profile 25÷ 30 microns
ANTI CORROSION PRIMER	R SYMBOL	22
	1st COAT	One coat of Ethyl Silicate Zinc-Rich with solvent. D.F.T. 75 microns
FINISH SYMBOL		01
	1st COAT	
	2nd COAT	
	TOTAL DRY	FILM THICNESS : 75 microns

Notes: Pipes, Fittings and Flanges shall be completely painted at site (surface preparation and anticorrosive primer).

Valves and Equipment shall be completely painted at Manufacturer's shop (surface preparation and anticorrosive primer).





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**4.5** Hot and cold insulated carbon and alloy steel surfaces of Piping (pipes, fittings, flanges, valves) and Equipment (vessels, exchangers, columns, etc.) with operating temperature from 400 up to 650°C.

SYSTEM SYMBOL		22 01 F
PREPARATION SYMBOL		F
		Blast cleaning grade Sa 2½ as per Standard ISO 8501-1:1988 or as per SSPC VIS-1 degree SP 10. Bast cleaning profile 25÷ 30 microns
ANTI CORROSION PRIMER	RSYMBOL	22
	1st COA	AT One coat of Special High Temperature Resistant Coating with solvent. D.F.T. 75 microns
FINISH SYMBOL		01
	1st COAT	
	2nd COAT	
	TOTAL DRY	FILM THICNESS : 75 microns

Notes: Pipes, Fittings and Flanges shall be completely painted at site (surface preparation and anticorrosive primer).

Valves and Equipment shall be completely painted at Manufacturer's shop (surface preparation and anticorrosive primer).





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...

# 4.6 Machinery, Electrical and Instrument Items

Machinery, Electrical, Instrument and Skid mounted packages shall be completely painted (surface preparation, anticorrosive primer, finish coats) according to Manufacturer's Standard.

Manufacturer shall carry out the complete paint system in compliance with the environment where the steel surfaces will work and shall issue the necessary recommendations for retouching, repairing and renewal of the shop painted surfaces.





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#### 5 QUALITY CONTROL REQUIREMENTS

The following inspections and testings shall be performed during and on completion of application of the paint system:

- Visual examination of surface preparation in accordance with Standard ISO 8501-1:1988
  - Check of blast cleaning profile using a suitable profile meter
  - Check of paints documentation
  - Check of expiry dates of the priming and finishing coats
  - Check of meteorological and environmental conditions
  - Visual examination of appearance and uniformity of the painted surface
  - Check of top coating and drying time, in accordance with the directions of the paint Manufacturer
  - Check of paint drying and polymerization
  - Check of dry film thickness by suitable non-destructive instruments such as "MIKROTEST, DIAMETER" or equivalent
  - Check of adhesion (on the finishing) according ASTM-D-3359.

    Degrees lower than 3A and/or 3B are not accepted.
- If, during the above mentioned inspections, painting defects (such as dripping, blistering, mudcracking, over thickness and dry spay) or conditions of preparation, thickness, etc. not conform to the requirements would be ascertained, the Applicator shall, at his own care and expense, bring back the faulty surfaces to the acceptability degree.
  - -Workshop and field quality control plan for painting shall be performed in compliance with SPC N. JV-ZA-E-09623





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#### **6 GENERAL REQUIREMENTS**

- The abrasive to be used shall be chloride-free siliceouns sand (marine sand excluded) or metal grit.
- Blast cleaning and painting shall not be carried out on wet surfaces.
- No acid washes or other cleaning solutions or solvents shall be used on metal surfaces after they have been blast cleaned.
- The surface preparation of all steel surfaces to be coated shall be free of mill scale, rust corrosion product, oxides, paint, oil or other foreign matter.
- Only dry blast cleaning procedures shall be allowed. The compressed air used for blasting shall be free of detrimental amount of water and oil.
- The primer shall be applied immediately after the completion of the blast cleaning.
  - Before applying the paint, the fitness of the preparation of the surfaces to be painted shall be ascertained.
  - The painting work shall be carried out carefully, by suitable labour.
  - Application of painting system (number of coats, thickness, etc.) shall be in accordance with this specification.
  - Each coat of paint shall be of a different colour, so as to produce a contrast which will ensure through covering of the next coat.
- Paints, either supplied already mixed (one component) or with the components in separate containers (two components) shall be properly mixed before use so as to make them homogeneous and consistent.
  - No thinner shall be added to the paints, unless specifically approved by the Paint Manufacturer. In such a case, the type of thinner used and its amount shall be in accordance with the Paint Manufacturer's recommendations.





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- The thinner shall be added during the process of mixing and homogenixing of the paints.
- Paints shall be stored in well-ventilated rooms, far away from heat sources, open flames, sparks, and protected from sun rays.
- The system symbols shown in this specification are codes for computer purpose only.
- Insulated stainless steel piping and equipment will not be painted.
- Uninsulated stainless steel and hot dip galvanized surfaces shall not be painted.
- Touch-ups on welded areas of hot dip galvanized surfaces shall be treated as follow:
  - -surface preparation:

Remove oil, grease and any other foreign material from surface by wash with a suitable chlorine-free solvent, in accordance to SSPC-SP1 standard, on all complete galvanized areas near welding damaged surfaces.

Hand or power tool cleaning for welded surfaces where hot dip galvanized surfaces is damaged,in accordance to SSPC-SP2 standard,in order to remove all welding slags.

# -paint application:

A single coat of two-pack epoxy surface tolerant mastic, CARBOLINE 15 type or equivalent, with a thickness of 125 microm (DFT) applied on prepared dry surface including a suitable lateral overlapping on galvanized areas of about 50 mm on each side.





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# 7 COLOURS

The colours for the top coats listed below shall be in accordance with RAL 840 HR, RAL F2 code.

- Surface of uninsulated piping and equipment with an operating temperature up to 70°C (Firefighting excluded)	GRAY	RAL-7035
- Surface of uninsulated piping and equipment with an operating temperature over 70°C	ALUMINIUM	RAL-9006
- Piping and Equipment for firefighting purpose	RED	RAL-3002
- Pipe supports	GREEN	RAL-6002
- Tanks	WHITE	RAL-9010
- Uninsulated Machinery with operating temperature up to 70°C	GRAY	RAL-7035
- Uninsulated Machinery with operating temperature over 70°C	ALUMINIUM	RAL-9006
- Motors	BLUE	RAL-5012
- Baseplates	BLACK	RAL-9005
- Electrical Motors and Alternators	BLUE	RAL-5012
- Transformers	GRAY	RAL-7035
- Switchboards and Electric Control Panels	GRAY	RAL-7035
- Electrical and Instrument bulk material	Manufacturer's	Std.





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# 8 guarantees

- 8.1 The Applicator shall assure that the surface preparation and application of hte painting products shall be carried out according to this specification.
- 8.2 The guarantee period shall last as indicated in the specification.

  During the guarantee period the rusting degees, according to the European Scale of Rusting Degrees, shall not exceed the value indicated here under:

after 12 months Re1 after 24 months Re2

All the other defects such as "blistering", peeling, etc. even without the presence of rust, are not admitted during the period of guarantee as they can give rise to corrosion, adherence defects, film degrading.





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# Engineering Specification for Site Conditions





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- 2 DEFINITIONS/ABBREVEATIONS
- 3 LOCATION
- 4 SITE CONDITION
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  - 4.2 Humidity
  - 4.3 Barometric Pressure
  - 4.4 Rainfall
  - 4.5 Snow
  - 4.6 Wind
  - 4.7 Design data for Air Conditioning
    - 4.7.1 Summer
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    - 4.7.3 Fresh Air changes
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  - 4.8 Earth Quake
  - 4.9 Others
- 5 SPECIFICATION OF UTILITIES



**6 ELACTRICAL POWER SPECIFICATIONS** 





Title: Engineering Specification for Site Conditions

Page: 3

# 1. GENERAL

This engineering specification covers general information regarding site data and climatic conditions. The equipment supplied must be able to withstand the ambient conditions as described below for transport, storage and operation of the plant.

#### 2. DEFINITIONS/ABBREVEATIONS

OWNER Petrochemical Research & Technology Company

VENDOR Companies Awarded by Owner for Procurement Services, Inspection

Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination

as defined in the purchase order.

EQUIPMENT Means any equipment, material and components to be permanently

installed in the PLANT and special tools, test equipment and erection-, pre-commissioning-, commissioning-, start-up-, two years- and capital-

spare-parts

CONTRACT Means contract between OWNER and VENDOR

PURCHASE ORDER Means document of commitment between Owner and

VENDOR for the supply of EQUIPMENT

PLANT Means the area within battery limits

SITE Means the area NPC-RT, ARAK/IRAN

# 3 LOCATION

The town of Arak is situated about 300 km south-west of Tehran/Iran. The site for NPC-RT Complex is located 22 km South-west of Arak.

# 4 SITE CONDITION

Materials shall be protected against corrosion during transit as necessary, when required, materials shall be painted or Coated in accordance with Particulars Contained in the purchase order and/or specification.





Title: Engineering Specification for Site Conditions

- Ambient Temperature

Page: 4

# 4.1 Temperature

<ul><li>Highest maximum on record</li><li>Lowest minimum on record</li></ul>	44°c -28°c
<ul><li>Design temperature</li><li>Process design dry bulb</li></ul>	Max. 40°c

Min. -16°c

• Process design wet bulb

• Mechanical design of equipment,
steel structures, civil works,

• Design temperature for outdoor
electrical and instrument equipment

Design temperature for air coolers
Winterizing
40°c
-21°c

Design temperature for equipment
 exposed to sunlight
 Soil temperature for cable sizing
 30°c

Design temperature for electrical equipment in substations
 Design temperature for chillers and
 45°c
 40°c

condensing unit refrigeration

# 4.2 Humidity

- relative in January Max. 86%

#### 4.3 Barometric Pressure

Min. / Max.
Average
802 / 818 millibars
810 millibars

#### 4.4 Rainfall

- Design Max. 80 mm (24 hours) Max.40mm (1 hour)

- Sewer design 40 mm/h

Rainy season months are November through April.





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# **4.5** Snow

- Snow load

 $175 \text{ kg/m}^2$ 

# **4.6** Wind

- Prevailing wind direction West-East
- Wind velocity at 10 m above grade 120 km/h max.
- Wind loads as per UBC 1985 edition chapter 23 vol. 1.

Wind force "H"-The wind force shall be computed as the product of the design wind pressure "P", the project area of the windward face "A", the appropriate shape factor "C", and the standard projected area increase factor "I".

Thus H = PACI

Where H = Wind Force (kg)

P = Design Wind Pressure  $(kg/m^2)$  (see table 2.1)

A = Projected Area of the Windward Face (m<sup>2</sup>)

C = Shape Factor (see table 2.2)

I = Project Area Increase Factor (see table 2.2)

Table 2.1 - Design Wind Pressure "p"

Height Zone	"p"
(M.)	Kg/m²
0-10	100
10-20	120
20-30	133
30&up	150

# Table 2.2-Factor "I"

<u>Surface</u>	Typical use	<u>C</u>	Ī
Cylindrical	Process vessels		
24" thru. 30" Dia. 36" thru. 48" Dia. 54" thru. 72" Dia. 78" thru. 96" Dia 102" and up Spherical  Flat Steel or concrete open structure: Wind normal to one of the sides Wind acting on corners:	Storage vessels (any diameter) Closed structure	0.6 0.6 0.6 0.6 0.6 0.6 1.0	1.50 1.37 1.28 1.20 1.18 1.1 1.0





1.0

1.0

8.0

1.3

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	<ul> <li>- 3 cornered structures</li> <li>- 4 cornered structures</li> <li>- Individual elements:</li> <li>Cylindrical sections with diameter equal to or less</li> </ul>	2.2 2.4	1.0 1.0	

# 4.7 Design data for Air Conditioning

than 2 inches

Flat or angular section

#### **4.7.1 Summer**

- Technical offices and control rooms

<ul><li>Indoor required temp. (dry bulb)</li><li>Relative humidity</li></ul>	25 °C ± 1°C 50% ± 5%
<ul><li> Electrical Substations</li><li> Indoor required temp. (dry bulb)</li><li> Relative humidity</li></ul>	35 °C ± 1°C 50% ± 10%
- Outdoor temperature (dry / wet bulb)	37/21°C

# **4.7.2 Winter**

- Technical Offices and control Rooms

• Indoor required temp. (dry bulb) 22  $^{\circ}$ C  $\pm$  1  $^{\circ}$ C • Relative humidity 45%  $\pm$  5%

- Electrical Substations

Indoor required temp. (dry bulb)
 2 °c min.

- Outdoor temperature -16 °C

# 4.7.3 Fresh Air Changes

<ul><li>Minimum for air conditioning system</li><li>Sanitary rooms</li><li>Battery rooms</li><li>Kitchens</li></ul>	25 m <sup>3</sup> /h person 37 m <sup>3</sup> /h m <sup>2</sup> surface 15 cph 15 cph
- Toilets	20 cph





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# 4.7.4 Pressurization

- Technical offices, control rooms

electrical substation 5 mm w.g.
- Closed warehouses 2 mm w.g.
- Cold storage warehouses 3 mm w.g.

# 4.8 Earth Quake

Seismic factor in accordance with zone 3 of UBC, latest edition.

# 4.9 Others

- Frost line : 1.0 m below grade level

- Water table : Approx. 15 m below grade level

Thunder and lightingSand stormTo be considered

- Altitude above sea level : 1888.48 m- Ground resistivity : 400 Ohm.m

# 5 SPECIFICATION OF UTILITIES

Run- off coefficients shall be as follows:

00
35
10
20

Unless otherwise deduced from soil report.





Title: Engineering Specification for Site Conditions

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# 6 ELECTRICAL POWER SPECIFICATIONS

Circuit Voltage		
- A. C. control circuit		
Voltage :	400 Volt	
Frequency:	50Hz	
Phase:	3-phase	☐ single-phase
Wire:	3-wire	☐ 2-wire
Instrument circuit		
A.C.		
Voltage:	110 Volt	
Frequency:	50Hz	
Phase:	☐ 3-phase	single-phase
Wire:	☐ 3-wire	2-wire
D.C.		
<u>Voltage</u> :	24 Volt	

PROJECT: PP-PE PILOT PLANT	Client:		
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TITLE: UTILITY CONDITION

# Nitrogen Specification

Supply conditions at Pilot Plant Battery Limit (B.L.)

	Licensor requirements		Guaranted
Purity			%mol N <sub>2</sub>
Oxygen	10	ppm. vol. max	10
Water	20	ppm. vol. max	5
Dew Point			°C

# High Pressure

	Max.	Nor.	Min.
Pressure (barg):			
Temperature (°C):			

Mechanical design conditions:

Pressure (barg):	
Temperature (°C):	

Bottle: 150/180 bar

Medium Pressure

	Max.	Nor.	Min.
Pressure (barg):	7	6.1	4
Temperature (°C):	Amb	Amb	Amb

NIT

Mechanical design conditions:

Pressure (barg):	8
Temperature (°C):	-30/+100

# Low Pressure

# NIL

	Max.	Nor.	Min.
Pressure (barg):	4	3.5	
Temperature (°C):	Amb	Amb	

Mechanical design conditions:

20.101.01.01			
Pressure (barg):	5		
Temperature (°C):	100		

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# Air Specification

Supply conditions at Pilot Plant Battery Limit (B.L.)

	Licensor requirements	Guaranted
Oil	free	free
Dust	free	free
Dew poir	nt (°C)	- 40 °C

Instrument air

**INA** 

	Max.	Nor.	Min.
Pressure (barg):	8.5	6.6	4.5
Temperature (°C):	Amb.	Amb.	Amb.

Mechanical design conditions:

Pressure (barg):	10/35
Temperature (°C):	100

# Plant Air or Utility Air UTA

	Max.	Nor.	Min.
Pressure (barg):	9.5	6.8	
Temperature (°C):	Amb.	Amb.	

Mechanical design conditions:

Pressure (barg):	10
Temperature (°C):	100

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# TITLE: UTILITY CONDITION

$\sim$ $\cdot$	$\sim$		
Steam	C.DO	ヘリナリヘイ	ntion.
STEALL	. 700		711()[1
Otoaiii	Opo	011100	201011

Header conditions at Pilot Plant Battery Limit (B.L.):

# High Pressure NOT AVAILABLE

	Max.	Nor.	Min.
Pressure (barg):			
Temperature (°C):			

Mechanical design conditions:

Pressure (barg):	
Temperature (°C):	

# Medium Pressure

MPS

	Max.	Nor.	Min.
Pressure (barg):	25	20	18
Temperature (°C)	sat.+ 30		sat.
Calculated Temp. (	226 - 256	220 - 250	210 -240

min. = sat.

max. = sat. + 30°C

Mechanical design conditions:

Pressure (barg):	30
Temperature (°C):	256

# Low Pressure (LPS)

**LPS** 

	Max.	Nor.	Min.
Pressure (barg):	6.5	5.5	5
Temperature (°C):	180	162	sat.

Mechanical design conditions:

oorialiorio.		
Pressure (barg):	10	
Temperature (°C):	185	

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# TITLE: UTILITY CONDITION

# Water Specification

# Cooling Water (CW) CWS/CWR

(1) Specification: suitably treated to inhibit biological growth, corrosion and scaling

(2) Supply and return conditions at Pilot Plant Battery Limit (B.L.):

	Pressure	(barg)	Tempera	ture (°C)
Supply:	6 / 5.5 / 2.5	max/nor/min	27	max
Return:	2.5	norm	37	max

(3) Mechanical design conditions:

Pressure (barg)	10	
Temperature (°C)	185	

IWA

# Industrial Water

- (1) Specification: filtered water suitable for process
- (2) Supply conditions at Pilot Plant Battery Limit (B.L.)

Pressure (barg)	5	max
Temperature (°C	Amb.	max

(3) Mechanical design conditions:

Pressure (barg):	6
Temperature (°C):	100

# Demineralized Water DWA

(1) Supply conditions at Pilot Plant Battery Limit (B.L.)

Pressure (barg)	8	max
Temperature (°C)	70	max

(2) Mechanical design conditions:

Pressure (barg):	10
Temperature (°C):	185

Document No.: 900-SPC-A4-PR-0006

Owner Job No.:

Contract Job No.:

Rev: 00

Type : SPC

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#### CONTENTS

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  - 4.1 Language / units
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  - 4.5 Identification
  - 4.6 Internal presentation
  - 4.7 Vendor documents numbering
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- 7. Transmittal of documentation
- 8. Documents for engineering
  - 8.1 Vendor drawing and documentation list
  - 8.2 Plate arrangement drawing and material list
  - 8.3 General arrangements drawing
  - 8.4 Detail drawings
  - 8.5 Calculation notes
  - 8.6 Spare parts list
- 9. Description of inspection and / or acceptance documents
  - 9.1 Material certificates
  - 9.2 Welders qualification
  - 9.3 Hydraulic test report
- 10. Issuance schedule





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#### 1. Purpose

The purpose of this procedure is to give instructions for preparation of Vendor's data book (mechanical catalogue) applicable to the contract.

# 2. Difinition

VENDOR Companies Awarded by Owner for Procurement Services, Inspection

Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as

defined in the purchase order.

OWNER: Petrochemical Research & Technology Company

# 3. Content

The Vendor's Data Book shall contain comprehensive detailed information covering design and engineering, inspection and testing, installation, operation and maintenance manual of the equipment and accessories included in, and supplied for the plant.

In addition, VENDOR shall submit the drawings and documents according to the "LIST OF DOCUMENTS REQUIRED FROM VENDOR "given in the requisition / purchase order.

For a sample of the contents of VENDOR's data book refer to Attachment No. 1.

# 4. Instructions Concerning Vendor's Data Books Presentation

# 4.1 Language / Units

All documents and drawings for design and fabrication shall be written in English as well as all Maintenance and Operating Instructions.

All units and dimensions shall be in the metric system except for the following:

- Size of pipe and valve (Inch)
- Flange rating (Pound)

If necessary, other units and dimensions shall be used with OWNER approval.





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#### 4.2 Size Of Documents

• All drawings shall be prepared on ISO standard size sheets, i.e.

A0 : 840 x 1188 mm A1 : 594 x 840 mm A2 : 420 x 594 mm A3 : 297 x 420 mm A4 : 210 x 297 mm

- Size A0 should be used only with OWNER approval. Larger sizes are not allowed.
- In general all drawings shall be reduced to 297 mm x random length size for convenience in handling.
- All documents other than drawings shall be prepared on standard A3 or A4 size sheets suitable for insertion in an A4 hard-core binder.
- All reduced drawings, data, etc. shall be legible.

# 4.3 Class Of Documents

All drawings / data submitted must be of good quality that will allow production of legible copies.

• Documents submitted to OWNER for comments:

These documents give all data necessary to understand operation and to appraise the construction method, assembly, disassembly, fastening and connections of equipment. They clearly indicate the scope of supply and specify all details necessary for installation.

• Final documents:

These documents are certified, "As built" documents finally reviewed without comment by OWNER.

OWNER comments on VENDOR documentation shall in no way relieve the VENDOR of his responsibility especially concerning the design of the equipment or facilities.

#### 4.4 Books Form

All the documentation shall be inserted in A4 (297 mm x 210 mm) white color binder (Punch holes shall be two).

Other types, such as folders or boxes with loose sheets, are not acceptable.

The thickness of each volume shall under no circumstance exceed that of a normal file (7 cm). The paper level inside each file shall be at least 5 mm below the opening point of the binder.





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Drawings and documents with sizes larger than A3 will be folded in plastic jackets inserted in the file, with opening upward.

#### 4.5 Identification

Each Vendor's data book shall be identified on its back and on the cover by a standard label, the format of which is given in Attachment No.2.

#### 4.6 Internal Presentation

All drawings and documents shall be written in English.

Cardboard division sheets shall separate different groups of documents, sheets and directions. At least rigid index sheets with numbering shall separate the different chapters.

The wording and presentation of the reports will be controlled with utmost care.

Consequently, any loose presentation, which may give the OWNER impression of careless work, will be rejected. This applies in particular to:

- All manuscripts or type texts with handwritten comments (except for technical documents on OWNER or Vendor's standard forms).
- All texts in any language other than English, unless they are transmitted together with a translation in compliance with the above requirement.
- All copies that might be questionable: writing too light, dark background areas, dark edge due to poor centering, titled copy, perforation marks, etc.

# 4.7. Vendor Document Numbering

In addition to the Vendor's document number, VENDOR shall add OWNER's document number.

The block shown here below will be placed on each "first page" of specification, data sheet and each drawing in addition to the Vendor's label.

National Petro	ochemical Company / Petrochemical Rese	arch & T	<b>Technolo</b>	gy Company										
PP-PE Pilot Plant														
	Owner Project No.	Rev.	Date	Signature										
NPC-RT	Owner Doc/Dwg. No.													
<b>PP-PE Pilot Plant</b>	Sh. Of													





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All other pages of the specifications and data sheets shall have the following block.

Project No.	Owner Project	Rev.
	No.	Sh. Of
OWNER DOC. N	lo.	

#### 5. Number Of Vendor's Data Books Per Purchase Order

If the purchase order includes several separate requisitions or covers several items, which are to be shipped with different vessels, the VENDOR shall supply as many separate Vendor's data books, as there are separate requisitions and/or shipments.

If the requisition covers a large number of items, a common part and specific chapters by item may be planned in agreement with OWNER.

# VENDOR shall prepare:

- 10 Copies of the complete VENDOR Data Book.
- Copy of electronic file in CD
- 2 Reproducible copy of final drawings / documents

#### 6. **Delivery Time**

Documents submitted for review are forwarded in compliance with the dates specified on the Attachment # 2 of requisition.

Final documents shall be forwarded 15 days after receipt of documents commented by OWNER.

Delivery dates are mandatory and a payment installment may be conditioned by the receipt of documents and/or drawings (refer to the order provisions).

#### 7. **Transmittal Of Documentation**

All drawings and documents shall be transmitted with a transmittal note to the address indicated in the Purchase contract. Purchase order number should be clearly indicated.

Any drawing, which is unreadable, will be returned without fail to the VENDOR who shall in no case use this as an excuse for delivery delay.

Any revision made on documentation should be highlighted with a cloud mark.





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# 8. **Documents For Engineering**

This paragraph is to clarify OWNER requirements concerning the presentation of some essential engineering documents and drawings submitted for approval. The items indicated below refer to the items listed in the "LIST OF DOCUMENTS REQUIRED FROM THE VENDOR" shown in the attachment # 2 of requisition.

# 8.1 Vendor Drawing And Documentation List

The VENDOR'S shall provide an exhaustive list of the documentation to be delivered. It should be sent together with the first issue of documents.

# 8.2 Plate Arrangement Drawing And Material List

This drawing shall be in proper scale.

The plate arrangement drawing or sketch shall indicated as a minimum:

- A general outline of the equipment (shells, heads, supports, skirt, lugs, saddles, stiffeners, etc.);
- For columns, shell / cone / skirt development including all internal & external attachments;
- Position of circumferential and longitudinal weld seams in accordance with plates sizes;
- Head shape (and plate arrangement in case of composed head);
- Shape of reduction cone (straight flange, knuckle radius, etc.);
- Plate thickness after plate forming;
- Material specification;
- Material list

Approval of this document enables order of main materials to be finalized.

The material list for nozzles shall be presented in schedule form. It shall be established from the nozzles list shown on the engineering arrangement drawing or process data sheet, and shall include:

- Identification (or item), quantity and diameter of nozzles;
- Type, rating, facing and material of flanges;
- Schedule or thickness of nozzle necks;
- Diameter, thickness and material of reinforcements;
- Material, thickness, rating of blind flanges (if any);
- Diameter, quantity, length, thread type, material of stud bolts and nuts;
- Definition, rating, materials of gaskets





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This document is prepared from information known when equipment is ordered. Its approval will allow the above accessories to be supplied.

Any modifications of one of the items listed above will involve revision of the documents and be followed by new approval.

After approval, the material list shall be transferred on the VENDOR general arrangement drawing.

Note: these documents do not apply to storage tanks.

# 8.3 Item: General Arrangement Drawing

The VENDOR can start fabrication only after receiving OWNER approval of this document as a minimum.

This drawing shall be in proper scale.

This drawing shall give the following technical information:

- Main dimensions, overall length, minimum thickness of major components;
- Design code, design pressure and temperature, hydrostatic test pressure, non-destructive tests, heat treatment, etc.;
- Corresponding material specification;
- Location and orientation of weld seams (shells, heads, skirt, etc.);
- Shape of heads or, type/ angle of roof for storage tanks;
- Location, orientation of nozzle gussets and other external welded Attachments;
- Location & orientation of internals (trays supports, coils, demisters, baffles, etc.);
- List of nozzles and connections in accordance with material list (dia., type, rating, schedule, etc.);
- Gaskets and bolting (type, material, etc.);
- All information of scope of supply;
- All information on anchoring system;
- Fabricated weight;
- Empty weight;
- Hydro test weight;
- Operating weight;
- Net weight of removable parts;
- Type of paint and its surface preparation;
- North direction;
- List of detail drawings;
- Insulation / fire proofing support detail;

Note: OWNER guide drawings shall not be used as construction drawings.





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# 8.4 Detail Drawings

These drawings shall include references to general arrangement drawing and show:

- Detail of all accessories, internal and external attachment (gussets, etc.): With weld geometry and specification in accordance with approved welding procedure;
- Weight and dimension of removable internals;
- Part list of the various elements:
- Weld geometry and specification in accordance with approved welding procedure;
- All information required on manufacturer name plate;
- Insulation / Fire proofing support detail;
- All construction details not covered above;

All this information may be shown on general arrangement drawing, at Vendor's choice.

#### **8.5** Calculation Notes

Calculation notes shall be in accordance with general arrangement drawing. VENDOR shall establish calculation notes for each equipment. They shall in all cases be included in "manufacturer file".

These documents shall be clearly marked with identification numbers as other VENDOR documents.

They shall include full reference to information sources (codes, formulas, etc.) used for design.

These documents shall be transmitted for review / approval to OWNER. These documents shall be approved prior to general arrangement drawing approval. OWNER approval shall in no case relieve the VENDOR from his responsibilities.

# 8.6 Spare Parts List

SPARE PARTS LIST AND INTERCHANGEABILITY RECORD (SPIR form) to be filled out by VENDOR according to it's filling procedure.

# 9. <u>Description Of Inspection And/Or Acceptance Documents</u>

This paragraph clarifies OWNER requirements for documents relating to inspection and acceptance of equipment.

The items indicated below refer to the items listed in the "LIST OF DOCUMENTS REQUIRED FROM THE VENDOR" included in the requisition.





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#### 9.1 Material Certificates

All pressurized parts shall be considered as main components requiring certificates type 3

- .1. B including:
- Shell, heads, cones
- Skirt, saddles, support brackets
- Tubes, flanges, forging, internal piping, nozzle necks
- Bolting for nozzle and shell flanges
- Welding material

# 9.2 Welders Qualification

This document shall contain all the information concerning:

- Welders (name, number, mark)
- Welding procedure
- Base material (specification, thickness, etc.)
- Welding material (specification, diameter, etc.)
- Electrode type
- Destructive tests results (bending, tensile, impact tests)

All information required on the QW 484 forms given by ASME section IX shall be considered as a minimum.

# 9.3 Hydraulic Test Report

This document shall contain the following information:

- Type and volume of equipment
- Contained gas analysis
- Description of equipment (length, width or diameter, nature of base material, thickness)
- Construction number and date
- Hydrostatic test pressure in letters
- Date of inspection (before test) and inspector's name
- Hydrostatic test data
- Signatures of inspectors

# 10. <u>Issuance Schedule</u>

Final Vendor's data books should normally be shipped to the OWNER as per agreed delivery schedule specified in PO of the relevant equipment.

Such final Vendor's data books shall be an integral part of the Vendor's services set forth in the purchase order and the following precautions must be taken in order to meet the above shipping requirements:





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At the latest 2 months before the scheduled delivery date, the VENDOR shall transmit the Vendor's data book model to OWNER for comments and approval.

The model shall be in conformity with the final internal and external presentation and shall contain all documents required for the final report.

A non- completed form will replace the final acceptance documents, which do not exist at that stage.

Note: Recommendation for handling, transport and storage shall be shipped in box together with the equipment.





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# ATTACHMENT # 1

VENDOR DATA BOOK'S CONTENT (SAMPLE)





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# **PART 1:** General Descripton Of The Equipment

- 1.1. OWNER's requisition
- 1.2. General description including OWNER's specifications and data sheets and drawings

# PART 2: Recommendations For Storage, Handling And Lifting

- 2.1. Special precautions for handling prior erection (1)
- 2.2. Recommendations for storage prior and during erection

# PART 3: Erection

- 3.1. List of components to be erected/installed on site
- 3.2. Detailed schedule of the erection including hypothesis taken into account
- 3.3. Procedures for erection and installation of the equipment
- 3.4. Schedule of connection points detailing locations and dimensions
- 3.5. Electrical terminal wiring diagrams
- 3.6. Details of site assembly, and filed welds
- 3.7. List of special tools for site erection and assembly
- 3.8. Procedures for site assembly, leveling and welding
- 3.9. Welding specifications for field welds
- 3.10. List of checks and tests to be performed on site
- 3.11. Site testing and acceptance procedures
- 3.12. Procedures for preparation of the equipment for commissioning (including the calibration of instruments)
- 3.13. List of works to be implemented on site instead of Vendor's shop (When required)
- 3.14. Weight (empty, full of water)

# **PART 4**: Start-Up Running Instructions

- 4.1. General
- 4.2. Principle
- 4.3. Operation
- 4.4. Description of the apparatus
- 4.5. Commissioning
- 4.6. Running instructions





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#### **PART 5:** Maintenance Instructions

- 5.1. Maintenance
- 5.2. Safety instructions
- 5.3. General maintenance
- 5.4. Lubricant table and equivalence
- 5.5. Trouble shooting check lists and diagrams
- 5.6. Maintenance Schedule

# **PART 6:** Spare Parts (2), (6)

- 6.1. Spare parts for erection, precommissioning, commissioning and start-up
- 6.2. Spare parts for 2 years operation
- 6.3. Sectional drawings

# PART 7: Manufacturer's Documents / Drawings (3)

- 7.1. List of drawings (4)
- 7.2. Manufacturer's data report
- 7.3. Drawings (5)
- 7.4. Calculation notes
- 7.5. Curves and technical data (including P.W.H.T. if applicable)
- 7.6. MANUFACTURER name plate photography

# **PART 8: Quality Assurance And Manufacturing Documents**

- 8.1. Material test certificates
- 8.2. Welding Inspection controls and test reports
- 8.3. Welding procedure specification
- 8.4. Welding procedure qualification reports
- 8.5. Welder qualification reports
- 8.6. Weld identification
- 8.7. Plate identification sketch with heat numbers
- 8.8. Certificate of shop inspection (before hydrostatic test)
- 8.9. X-Ray identification
- 8.10. Radiographic procedure qualification
- 8.11. Radiographic reports along with radiographs
- 8.12. Batch test certificates from manufactures for electrodes
- 8.13. Hydrostatic and other test results and reports (such as visual control and N.D.T., etc.).
- 8.14. Precommissioning / commissioning check Lists & procedures
- 8.15. All other requirements as specified in the respective specifications





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# Remarks

- (1) Including a copy of transportation drawing
- (2) No spare parts price must be incorporated in this book
- Only issues approved by as "FINAL"
- (4) Only the drawings included in this part 7.
- (5) Drawings larger than A3 format must be folded and inserted in individual plastic skirts.
- Sufficient information to be prepared for spare parts Such as: materials of construction sizes / three proposed Vendor's, etc.





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# **ATTACHMENT # 2**

VENDOR'S DATA BOOK

**COVER** 





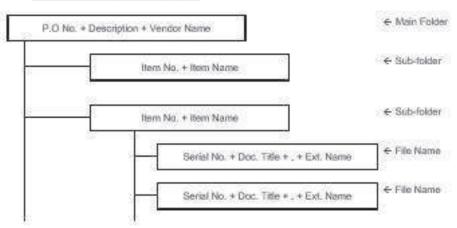
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# Attachment HE Bullerction for making Data CD

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# Construction of the Data Folder







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Title: PACKING AND MARKING PROCEDURE

# **CONTENTS**

- 1. Scope
- 2. Purpose
- 3. Definitions
- 4. Packing for Equipment and Materials
- 5. Packing and Marking for Electrical Panels And Instruments





Title: PACKING AND MARKING PROCEDURE

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# 1. Scope

1.1 This procedure gives the information for Packing and Marking and it is to be applied to vendors for the preparation, protection and packaging of materials, equipment, requiring export shipments for the PP-PE Pilot Plant Project to be built in Petrochemical Research & Technology Company, Arak/Iran.

The following instructions are intended as minimum requirements, and adherence to these instructions in no way, absolves or relieves Vendors of any responsibility or obligation outlined in the Purchase Order.

# 2. Purpose

This document defines the criteria required by the Project in relation to the packing and marking of both Project's Equipment and materials including Electrical Panels and Instruments.

# 3. <u>Definitions</u>

OWNER Petrochemical Research & Technology Company

PROJECT PP-PE Pilot Plant

GOODS All kind of materials and equipment to be incorporated

in the Project.

VENDOR Companies Awarded by Owner for Procurement

Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined

in the purchase order.

# 4. Packing For Equipment And Materials

- 4.1 Equipment and material shall be exported packed in compliance with General Purchase Conditions and the best established practice for overseas construction jobs in accordance with the following directives. In the event of any divergence between this specification and the established practice, this specification shall govern.
  - 4.1.1. "Seaworthy and tropical proof" according to international standard.
- 4.1.2 Packing and conservation of goods shall be sufficient to protect them from damage during transit from point of manufacture to the delivery at job site under conditions





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which may involve multiple handling, extended storage, exposure to moisture and the possibility of pilferage. The contents must withstand one year transit conditions without suffering damage and Vendors shall give recommendations for a further two(2) years storage under SITE conditions.

Required storage facilities and procedure shall be advised by manufacturer/seller in advance

- 4.1.3 The packing of the equipment and materials shall be carried out in order to comply with transport conditions.
- 4.1.4 Individual packages shall be kept as small in bulk as possible.
- 4.1.5 Individual packages exceeding a gross weight of 3,000 kgs shall be avoided, if possible.
- 4.1.6 Kind and dimension of packages shall be chosen to suit overseas transport in contáiners and to fully utilize the size of containers.
- 4.1.7 The following inside dimension of containers are to be observed:

40-feet-containers: 1195x220x205 cms. 20-feet-containers: 595x220x205 cms.

# 4.2 Modes of Packing

In accordance with the nature of the contents, the following modes of packing shall be considered:

- a) wooden cases
- b) wooden crates
- c) skid-construction (for vessels etc.)
- d) non-returnable steel drums (export variety)
- e) non-returnable cable reels
- f) bales
- g) 20 ft 40 ft non-refundable containers

#### 4.3 General Rules for Packing

4.3.1 Cases and crates shall be made from new, sound and seasoned lumber. Sheathing shall be of min 24 mm thickness.

If so required for static reasons, thicker sheathing shall be used, in accordance with size and weight of the package. Timber crates and boxes shall be strong enough to withstand without any damage, transport on ship board at sea and numerous handling between the works and the port of origin and between the port of destination and the site.





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- 4.3.2 Cases and crates with gross weight up to 1,000 kgs shall be provided with bottom cleats of min. 40 mm thickness to ensure clearance for handling by forklift.

  Cases and crates exceeding gross weight of 1,000 kgs shall be provided with skid runners, number and size according to weight of package.
- 4.3.3 The contents of cases shall be protected by waterproof and strong plastic foil which shall be sealed by welding. An adequate quantity of moisture absorbent (silica gel) shall be added to protect the contents for sufficiently long time from corrosion.
- 4.3.4 Felt, cellophane paper, polyester cuttings, crepe cellulose and some equally efficient materials may be used for padding or cushioning.Wood shavings and other paper shall not be used for padding or cushioning.
- 4.3.5 Materials shall be protected against corrosion during transit as necessary. All bright and machined parts shall be coated with a recognized rust preventative suited to the particular application concerned. All internal parts of machinery shall be treated with lubricant containing rust and oxidation inhibitors to protect equipment from any damage possible. Such lubricants shall be compatible with those which will subsequently be used in service and shall be identified by appropriate tagging.
- 4.3.6 When required, materials shall be painted or coated in accordance with the particulars contained in the purchase order and/or specifications.
- 4.3.7 All flanges, machined working surfaces and threaded parts of all equipment shall be suitably protected. All flanged connections of vessels shall be protected by metal plates correctly gasketed by wooden plugs or plastic caps suitably secured in position.
- 4.3.8 Units or parts belonging to main equipment but separately packed shall be clearly marked for easy identification with the main equipment to which they relate.
- 4.3.9 Packages containing "FRAGILE" articles shall be appropriately packed and in addition to the words "FRAGILE-HANDLE WITH CARE" being stenciled on two opposite sides, internationally recognized symbols shall also be used "This Side Up".
- 4.3.10 Pipe, structural steel sections and plates shall be strapped in bundles of convenient size and weight for handling. Rolled and shaped plates shall be provided with suitable bracing to eliminate distortion during transit, and shall be bundled in uniform lengths. The weight of each bundle shall be within the breaking strain of the steel wrapping. Each bundle shall be marked with a metal tag ,hard stamped, secured under steel wrapping. A 2000 kg limitation shall be imposed for lifts in this category. Where praticable long lengths shall be limited to 12.2 meters to avoid long length carriers. All small steel sections, handraíl stanchions, gusset plates etc. shall be boxed.
- 4.3.11 Black steel pipes with an outside diameter of up to 168.3 mm shall be bundled by strapping cleats above and below the load, with boards between each pipe layer and secured by bolts.





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Black steel pipes exceeding the above outside diameter shall be treated as an individual package and marked accordingly.

All black steel pipes shall be protected by means of TECTYL spray. The pipe ends shall be closed with plastic caps.

If, in case of pipes with large diameters, the pipe ends cannot be closed with plastic caps, the interior of the pipes shall also be protected and sprayed with TECTYL.

- 4.3.12 Bitumen coated pipes shall be prepared, packed and handled according to established practice.
- 4.3.13 Stainless steel pipes shall be packed in wooden cases. Protection with TECTYL is not necessary.
- 4.3.14 All valves and fittings (pipe elbows, flanges,etc.) shall be suitably protected and their method of shipment shall be:
  - a) All valves and fittings shall be suitably packed and shipped in metal strapped or wood re-enforced waterproof wooden cases with metal corner protection .
  - b) All treaded fittings shall be greased and provided with plastic caps.
  - c) Control valves shall be packed in wooden cases having adequately designed interior support with interior water proof protection .
- 4.3.15 Apparatus and vessels shall, where possible, be packed on skid constructions and secured with adjustable steel straps. All unprotected surfaces shall be sprayed with TECTYL. Manholes and other major openings shall be protected with either plastic caps or wooden lids, which shall be firmly secured. Smaller openings shall be closed with plastic plugs.
- 4.3.16 All vessel internals and items not installed by the vendor at works including accessories such as small parts, bolts, nuts, gaskets etc. shall be packed in wooden cases separately for each vessel or apparatus and marked with the same item number as the vessel/apparatus in order to protect all parts from loss or damage in transit. Internals, bolts and gaskets for service/ testing operations shall be supplied with the vessels/items by the vendor and all internals, boxed separately and marked according to marking procedures. Each item shall be supplied correctly and identified for field installation by others.

NOTE: It is imperative that all these items be clearly listed on the packing list.

- 4.3.17 Fire bricks, special tiles and insulation refractories shall be boxed after sealing in a polyethylene liner. These boxes shall be skid mounted. Instructions regarding storage prior to installation shall be stenciled on each box with particular reference to adverse weather/temperature/humidity conditions.
- 4.3.18 All electrical motors whether coupled or uncoupled, generatorors and electrical equipment shall have all openings sealed with protective tape, shall be packed in suitable weather proof skid mounted boxes, and protected from moisture ingress by desiccant as described above.





Title: PACKING AND MARKING PROCEDURE

Page: 6

Items with brushes shall be brushed and rust removed before shipment.

All electrical equipment shall be suitably protected to withstand 1 year transit conditions and Vendors shall give recommendations for a further , 2 years storage under site conditions

Batteries shall be shipped dry with electrolyte packed separately and shall include charging instructions.

- 4.3.19 All electronic and pneumatic instruments to be packed in accordane with given instructions and must be suitably protected to withstand 1 year transit conditions and Vendors are to give recommendations for a further 2 years storage under site conditions.
- 4.3.20 Pipeline / vessel insulation shall be packed in double water-proof wooden plywood cases and secured to pallets.
  - Drums of insulation mastic will also be shipped on pallets.
- 4.3.21 Spare parts for two years operation, which shall be individually tagged, must be covered with a suitable preservative and wrapped with greaseproof paper and be packed in separate cases from the base item. The cases are to bear the markings as specified and in addition the words "SPARE PARTS FOR TWO YEARS OPERATION".
- 4.3.22 Commissioning spares shall be individually tagged and marked "COMMISSIONING SPARES" and shall be packed and shipped with the base item.
- 4.3.23 All vessels/heat exchangers or items of such kind shall be dried, thoroughly cleaned inside and be free of all dirt and loose materials.
- 4.3.24 Should any materials be scheduled to be freighted as deck cargo, additional packing instructions may be required; the Vendor will advise, for vessels and columns, which shipment cradles will be used throughout the transportation. Cradles to be secured to vessels and columns, by strapping.
- 4.3.25 Paper bags suítably boxed, or water tight Steel Drums will be used for shipping cement, special aggregate, etc. Paperbags must not be less substantial then 60 lbs outer wall, 40 lbs inner wall and one moisture craft inner wall.
- 4.3.26 Unless otherwise specified, all export cases, boxes, bundles and containers are to be securely metal strapped with a minimum of two unanealed steel straps in each of two right angled and opposite directions, or where applicarle wood re-enforced.

NOTE: Should consignments arrive at the shipment point of origin visually damaged, the shipping agent will advise and await instruction before onward shippings.

4.3.27 All bulk items, lighting, fittings, cable glands, switches etc. are to be packed in batches sufficient for a specific volume of work.





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- 4.3.28 Cases and crates shall, according to their weight and size, be provided with two or more steel straps made of unannealed steel, applied with a stretching tool and secured with crimped steel seals.
- 4.3.29 Fittings (valves, pipe elbows, flanges, etc.) must be packed in wooden cases and must be protected.
- 4.3.30 Accessories for apparatus and vessels (small parts, bolts, nuts, washers, gaskets, etc.) are to be packed in wooden cases, separatelly for each apparatus or vessel. These cases must be marked with the same item No. as the apparatus/vessel to which it belongs (see also Item 5 packing lists).

All commissioning spare parts to be packed separately, being the packing marked with the relevant main item.

# 4.4 Marking of Packages

4.4.1 All packages shall be clearly stencilled on two opposite sides with black, indelible and seawater proof paint, as follows:

Wherever possible, the stenciled characters shall be 8 cms high.

In case the surfaces of a package are too small to permit stenciling, sheet metal tags shall be embossed with the above marking and shall be securely fastened on two opposite ends of the package.

- 4.4.2 If necessary, packages shall be additionally marked with cautionary symbols on two opposite ends.
- 4.4.3 Packages which may be stored in the open but under a tarpaulin, shall be marked with a red "double roof" symbol.
- 4.4.4 Packages which are to be stored in closed and dry places shall be marked with a red "double roof" symbol.
- 4.4.5 The system of package-numbering shall be indicated to the OWNER in due course of time
- 4.4.6 The gross weight shall be determined by the party who is responsible for the packing of the items/materials.
- 4.4.7 Example for marking of packages is shown in attach 1.

# 4.5 Packing list

The packing lists shall be prepared on standard forms:

The necessary number of forms will be made available to OWNER, who shall advise about the quantity required.

The packing list forms shall be filled in ENGLISH language.





Title: PACKING AND MARKING PROCEDURE

Page: 8

OWNER shall supply VENDOR with a specimen packing list showing how it is to be filled in.

At the same time OWNER shall be informed of the package numbers required for marking the packages. one column of the packing list shall be filled in with OWNER "ITEM NO." These item numbers shall be taken from the order form. Special attention shall be paid to the order form that the item number is correctly attributed to the goods to which it belongs. If any question should arise in this respect VENDOR shall contact the OWNERS Representative.

Special care shall be taken that all accessory parts loose or detachable, belonging to the main item under dispatch, shall also be individually listed in the packing list. In the event these accessory parts are not listed in the packing list, they shall be considered by OWNER as not delivered.

Two copies of the packing list in a water-proof plastic envelope shall securely be mailed under a galvanized steel sheet on the outer surface of the package The final packing list in 2-folds shall be available in OWNERS office 10 (TEN) working days prior to dispatch of the goods from the manufacturer's premises.

# 4.6 Liability and Guarantee

The party responsible for the packing shall be fully liable for and guarantee proper, sufficient and adequate packing, completeness of the contents, protection of the contents for a storage time of 12 month starting from the date when the equipment is loaded on the ship, and the correct preparation of the packing list.

All cost whatever resulting from inadeguate or insufficient packing shall be fully charged to the responsible party.

# 5. Packing And Marking For Electrical Panels And Instruments

#### 5.1 Scope

This section covers the method for packaging of electric and instrument panels for export delivery, which are to be provided with full protection against physical damage and atmospheric attack during transit and possible long periods under adverse storage conditions which may extend to two years.

# 5.2 General

This specification is for the package Vendor's guidance only.

Vendor shall remain fully responsible for selecting suitable materials for proper packaging and shall comply with the latest issues of the following European or British Standards: Where standards conflict with this specification, specification shall govern.

- Packing Code
- Silica gel for use as desiccant for packages
- Method of determining the permeability of materials used for packaging.





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The Vendor shall provide written instructions for the removal of protective coatings and devices.

#### 5.3 Method

5.3.1 The instrument or panel which shall be thoroughly clean, dry and free from rust shall be totally enclosed in a polythene shroud after sharp projections on the instrument or panel have been padded. Silica gel or other approved desiccant shall be strapped inside the shroud, but shall not come into contact with the paint work.

After the desiccant is strapped into position, the open ends of the shroud shall be heat sealed, only leaving an opening large enough for the insertion of an air extracting pipe. After extraction of the air from the shroud, the opening shall be completely sealed.

# 5.3.2 Packing Case Materials

- All wood shall be thoroughly seasoned and thoroughly sound without knots, knot holes, shakes and checks .
- Wood which can cause metallic such as oak , western red cedar and sweet chestnut shall not be used .
- The case shall be of sill base type. All sheating shall be tongued and grooved.

# 5.3.3 Packing Case Lining

The packing case shall be lined with completely multilayer waterproof.

The lining shall have as few joints as possible. If joints are necessary, the pieces shall be overlapped so that any rain water which may penetrate the case is shed automatically when the case is upright. Overlaps shall be 75 mm minimum Joints shall be made with Bostik 'C".

- 5.3.4 Securing Instruments or Panels Inside Packing Case.
  - a)The instrument or panel shall be completely secured by wooden battens faced with suitable rubber or other shock absorbing materials.
  - b)Wood, wool and other hydroscopic shall not be used.
  - c)Hay and straw shall not be used.

#### 5.3.5 Sealing of Packing Case

After nailing, joints in the case shall be sealed with Bostik Sealing Compound and the outside bound with steel strapping.

# 5.4 Marking of Packing Cases

- 5.4.1 Cases which are for Carriage by sea shall be marked "HOLD STORAGE".
- 5.4.2 All cases shall be marked to indicate the correct way up and bear the marking described here in above.





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# ATTACHMENT No.1

# MARKING OF PACKAGES

PROJECT:
PROJECT No.:
L/C No.:
OWNER:
ORDERED BY:
ORDER No.:
FINAL DESTINATION: Pouyesh Site, Arak / Iran
STORAGE CODE:
DIMENSION: L x W x H
GROSS WEIGHT:
NET WEIGHT:
PACKAGE No. :OF
MADE IN:





Title: SPARE PARTS PROCEDURE Page: A

PAGE RE	EV.	0	1	2	3	4	5	REV. PAGE	0	1	2	3	4	5	REV. PAGE	0	1	2	3	4	5
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These instructions outline the requirements for providing original manufacturer's precommissioning, commissioning and two years operation spare parts for a PP-PE Pilot Plant to be built in Petrochemical Research & Technology Company, Arak/Iran.

#### **CONTENTS**

- 1) General information
- 2) Definitions
- 3) Spare parts required
- 4) Required information
- 5) Identification
- 6) Packing and protection
- 7) Special storage items

#### **Attachments:**

- 1. Erection, precommissioning, commissioning and start-up phase spare parts
- 2. Two years operation spare parts
- 3. Guidelines for the compilation of Spare Parts Interchangeability Record (SPIR)
- 4. SPIR form





Title: SPARE PARTS PROCEDURE Page: 2

#### 1) General Information

These instruction outline the requirements for providing original manufacture's precommissioning, commissioning and two years operation spare parts for PP-PE Pilot Plant to be built in Petrochemical Research & Technology Company, Arak/Iran.

The Vendor is obliged to provide with an original equipment manufacturer spare parts data package, containing full and complete spare parts information and prices for each item of equipment supplied.

The Vendor shall recommend those spare parts that are deemed necessary on the basis of Vendor's recommendations and experience.

#### 2) <u>Definitions</u>

- 2.1 "Erection, Precommissioning, Commissioning and start-up spare parts" are those material, equipment or components necessary during the erection, precommissioning, commissioning and start-up activities of the Plant.
- 2.2 "Operating Spare Parts" are spare parts material, equipment or components necessary for the continuous operation of the plant after commissioning completion for a period of two years.
- 2.3 GOODS: All kind of materials and equipment to be incorporated in the Project.
- 2.4 VENDOR: Companies Awarded by Owner for Procurement Services, Inspection Affairs or Transportation, Providing of Project's goods, following up all transport activities from VENDOR workshop to final destination as defined in the purchase order.
- 2.5 OWNER: Petrochemical Research & Technology Company.

#### 3) Spare Parts Required

#### 3.1 Capital spare parts

Capital spare parts are defined in documentation prepared by technical department.

#### 3.2 Erection, precommissioning, commissioning and start-up Spare Parts

Vendor is requested to submit a Spare Parts proposal togheter with base quotation. Such spare parts shall be packed in separate boxes and shipped together with the main equipment/material purchased in order to be available at the site together with the base order supply.

Minimum required quantities are shown in attachment 1.





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#### 3.3 Two years operation spare parts

Vendor is requested to submit a Operation Spare Parts quotation based on his experience together with base quotation

The necessary and sufficient two years spare parts include those parts that are normally required to mantain the plant in a satisfactory working condition for a period of two years of continuous operation after plant start-up.

These Operation Spare Parts shall be packed in separate boxes.

Guidelines for selection of two years spare parts are shown in attachment 2.

#### 4) Required Information

- 4.1 All information and drawings must be in English language.
- 4.2 Data sheets, engineering drawings. manufacturer's catalogs and operating and maintenance manuals required to identify the function of and fully describe all parts associated with the equipment
- 4.3 The interchangeability of spare parts must be completely assured between all units contained on the parent equipment purchase order.
- 4.4 The Vendor shall guarantee the spare parts in accordane with the requirements requested for the parent equipment.
- 4.5 The offer must be valid for supply either for total or partial quantities.
- 4.6 All Spare Parts list shall be filled-in using the attached "Spare Parts Card" according also to the instructions attached herein.

Photocopied or hand-written documents are not acceptable.

Twelve (12) months price validity is required

#### 5) Identification

All spare parts shall be individually identified by one of the following methods:

- 5.1 A stainless steel label imprinted with letterine approximately 6 mm (1/4) high and secured to the part with S.S. wire.
- 5.2 Inscribing with an electric spark erosion pencil
- 5.3 On large items inscribing with non-fading, moisture resistant marking ink, figures/letters to be at least 25 mm (1) high. Ink shall be Pannier 1001 Yellow Industrial or equal.





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- 5.4 Items such as Ball Bearings which in actual storage will remain in their packing may be identified with an adhesive label firmly attached to the outside of the carton.
- 5.5 Alternative methods which are standard industrial practice may be used provided SP's approval has been obtained in writing in advance. Stamping directly into spare parts will not be allowed.
- The following shall appear on each spare or spare part label: Manufacturer's real part number.Short description (one word will suffice if space is limited).Tag number of equipment (if applicale).

#### 6) Packing And Protection

- Packing protection and marking of the packing container shall be as described in Project Packing and Marking Procedure 000-PCR-PRC-0002. Spare parts shall be packed separately from main equipment and the packing containers shall clearly be marked "erection, precommissioning, commissioning, and start-up spare parts" or "two years operating spare parts" as applicale. The following additional comments apply:
- Packing cases and other shipping containers must be capable of giving adequate protection to contents for a period of one year after despatch from Vendor work-shop (i.e. cases may after receipt at the Plant Site be stored outside before being unpacked).
- 6.3 Two years operating spares are to be protected and packed in such a manner as to ensure a minimum shelf life of four years in an un-air-conditioned warehouse sited in extremely dusty heavy industrial and coastal area with salt pollution location where the maximum shade temperature may exceed -14 +45 C. and where relative humidity reaches 90%.
- 6.4 Consumables items such as bolts and nuts shall be adequately oiled to prevent corrosion.
- Other unpackaged items shall be protected by a rust preservative oil, hard drying type. if the nature of the item permits the removal of the deposited tar oil skin by means of petroleum based solvents or the use of hot dip strippable coating.
- Any protection for stainless steel parts shall not contain chlorides or harmful metal salts such as Zinc, Lead, Copper. etc. Also marking paint or ink shall not contain similar harmful components.
- 6.7 Electronic and instrument parts shall be packed in sealed clear plastic bags along with a bagged amount of dessicant.

#### 7) Special Storage Items





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7.1 Vendor must advise of any spares which cannot be stored under the conditions stated in para. 6.2 and which require special storage conditions

7.2 Special Storage Items are to be clearly labelled with storage instructions such as:

STORE IN A COOL DRY PLACE AT C

STORE IN DARK PLACE

KEEP HUMIDITY BELOW %

etc.

7.3 Owner must be notified of all such items without delay before order placement since a restricted shelf life may require an amendment to order quantity and an appropriata reordering procedure.





Title: SPARE PARTS PROCEDURE

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### **ATTACHMENT 1**

#### ERECTION, PRECOMMISSIONING, COMMISSIONING AND START UP SPARE PARTS

1 \	FURNACES
11	FURNACES

Gaskets for coil:	50%
-Burner Tiles	100%
-Burner Tips	5%
-Fire eyes	10%
-Gas valves seat	100%
-Solenoid valves	25%

#### 2) EXCHANGERS, REACTORS & DRUMS/TANKS

Gaskets for Girth Flange, M/H& H/H	100%
------------------------------------	------

Stud Bolts and Nuts for the Above 5%(Min. 2 Sets)

Field-Installed Trays:

-Bolts and Nuts 15% (Min. 2 Sets)

-Washers (Metal and Asb.) 20% (Min. 2 Sets)

-Tray Clamps 10% (Min. 2 Sets)

-Asb. Rope and Tape 25% (Min. 2 Sets)

Field-Installed Internals, Piping and Other Bolted Internals:

Stud Bolts (Alloy and C.S.) 10% (Min. 2 Sets)

Washers and Nuts 10% (Min. 2 Sets)

Packing:

-Inert Balls 15%
-Raschig Rings / Sllotted Rings 15%
-Gaskets Sets And O-Rings 100%

-Fan for Air Cooler

#### 3) STEEL STRUCTURE AND PLATFORM

Bridge Crane:

-Bolts & Washers 15%





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10%
5%
10%
10%
10%
25%
5%
1 set Each Size
1 set Each Size
1 set Each Size
10%

#### 4) MACHINERY / PACKAGES

Please see the relevant engineering specifications of each equipment for commissioning spares.

Electrical Equipment: See item 9

**Instrumentation**:

- Control panel	See item 10
- Board instruments	See item 10
- Field Transmitters	See item 10
- Field instruments	See item 10
- Others	0%

## 5) <u>H.V.A.C.</u>

Bolts, Nuts, Gaslets for Field installation of Pipe/Duct 5%

Rotating Equipment See item 5

Heat Exchangers 0%

Filter Element 1 Set Each Size/Material

Electrical See Item 9

**Instrumentation**:

-Control panel See Item 10
-Board Instruments See Item 10
-Field Transmitters See Item 10





Title: SPARE PARTS PROCEDURE Page: 8

	-Field Instruments	See Item 10
	-Others	5%
6)	SPECIAL EQUIPMENT	
	Heat Exchanger	See Item 2
	Rotating Equipment	See Item 5
	Filter Element	1 Set Each Size/Mat'l
	Piping	0%
	Electrical	See Item 9
	<u>Instrumentation:</u>	
	-Control panel	See Item 10
	-Board Instruments	See Item 10
	-Field Transmitters	See Item 10
	-Field Instruments	See Item 10
	-Others	0%
7)	<u>PIPING</u>	
	Gaskets, all sizes	20%
	Stud Bolts less than1"	15%
	Stud Bolts 1" to 1 7/8"	10%
	Stud Bolts 2" and over	5%
	Welding Rods	10%
	Coating and Wrapping	10%

	Carbon Steel	Alloy/SS	Cast Iron
Pipe 2" and below	15%	4%	0%
3" to 6"	10%	2%	5%
8" and over	5%	1%	5%
(*) Valves 2" and below			
screwed and welded	10%	5%	0%
(*) flanged	2%	2%	0%





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(*) Valves 3" to 10"	2%	2%	0%
(*) Valves over 10"	0%	0%	0%
(*) Flanges up to 12"	5%	3%	0%
(*)14" and over	2%	2%	0%
(*) Fittings welded up to 2"	10%	6%	0%
(*)2 ½" to 10"	5%	3%	0%
(*)12" and over	3%	2%	0%
(*) Fittings Screwed up to 2"			
(*) 3" and over	5%	3%	0%
(*)Flanged all sizes	5%	3%	0%
(*) Hub and Spigot 3" to 12"	0%	0%	5%
(*) 4" and over	0%	0%	3%

Note: as indicated with (\*), where the percent gives the quantity consisting of a whole number plus a decimal less than 0.5, the decimal portion will be dropped; where the decimal portion is 0.5 and more, the next higher whole number quantity will be selected.

### 8) <u>ELECTRICAL EQUIPMENT</u>

Switchgear, Motor Control Centers MV/LV:

-Fuse elements	50%
-Bulb for Signal Lamps	50%
Local Control Panels & control stations:	
-Fuse elements	50%
-Bulb for Signal Lamps	50%

#### **Electire Motors:**

-Grease Nipples where applicable	10%+power
Lighting Fixtures	terminal (in J.B.) 2% 3%
Flag Relay	2%
Time Relay	2%
Terminal Block	2%
Auxiliary Relays	1%
Moving Contacts	15%





Title: SPARE PARTS PROCEDURE Page: 10

Fixed Contacts	15%
Coils for Contactors	10%
Boucholz Relay	one of each type and size
Thermometer	
Local Control Station:	5%
-Ammeter	
-Push button	5%
-Selector Switch	5%
UPS:	
-Fuse	*
-MCB (miniature circuit breaker)	*
-SCR	*
-DIOD	*
-Transistor	*
-Control cards	*
-Signaling lamps	*
-Batteries	*
Battery Charger:	
-Fuse	*
-MCB(miniature circuit breaker) -SCR	*
-DIOD	*
-Transistor	*
-Control cards	*
-Signaling lamps	*
-Batteries	*
Fire Alarm System	*
Telephone System	*
Paging System	*
Radio System	*
Emergency Diesel Generator	*
Sockets (400V, 230V, 24V)	5%





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Plugs(400V, 230V,24V) 5%

Portable 110V AC, 50Hz, with transformer 5% each type

Socket and plug (ex-type)

Hand lamp 24V AC, 50Hz(ex-type) 10 no.

All special tools, equipment and spare parts required for commissioning and start-up shall be provided.

These are the spare parts that VENDORS shall recommend based on experience.

#### 9) <u>INSTRUMENTATION</u>

#### For control Panel:

- Bulbs For Signal Lamps 50%

- Fuse Elements 50%

#### **Boards instruments:**

- Fuse elements 50%

- Chart paper for recorders 3 boxes each type

- Ink for Recorder 7 sets each type

- Pens for Recorders 50%

#### Field transmitters:

- Gasket 15%

#### Field instruments:

- Air pressure regulators 5%

- Temperature Indicators 10% each range

- Pressure gauges 10% each range

Solenoid Valves 2% each type(min 1 set)

Selonoid coils 3 coil each type

Valve positioners 2% each type(min 1 set)

Cable – Single Pair 20%

Cable – Multi Pair 15%

Cable Glands 20%

Junction Boxes – Large 1 min.

Pipe and Tube 10%





Title: SPARE PARTS PROCEDURE Page: 12

Fittings all type 15% each size

Valves 20%

Manifold Valves 10% each size

Cable Tray 20%

DCS:

- Bulbs for signal lamps 50%

- Fuse elements 50%

- Printer paper, Chart paper 4 boxes each type

- Printer Ribbon 10 sets each type

- Blank Floppy disks/magnetic tape cartridge 10 pieces

Gas Chromatograph:

-Filter elements 10%

-Calibration gas cylinders 1 cylinder (100 liter) each type

-Standard gas cylinders 1 cylinder (100 liter) each type

-Other gas cylinders 1 cylinder (100 liter) each type

Other Analyzers:

-Filter Elements 10%

-Calibration Gas Cylinders 1 cylinder (100 liter) each type

-Standard gas cylinders 1 cylinder (100 liter) each type

-Other gas cylinders 1 cylinder (100 liter) each type

10) PAINT AND INSULATION

Paint 10%

Insulation material 10%

Insulation Band & Seal 10%

Insulating Cement 10%

Insulation Sheet Metal 15%

Insulation Wire 10%

11) <u>UTILITY EQUIPMENT</u>

Heat Exchanger, Vessel, Tank and Tower

See item 2





Title: SPARE PARTS PROCEDURE Page: 13

Rotating Equipment See item 5

Filter Elements 1 Set Each Size/Mat'l

Piping 0%

Electrical See item 9

<u>Insturmentation</u>:

-Control panel See item 10

-Board Instruments See item 10

-Field Instruments See item 10

-Others 0%





Title: SPARE PARTS PROCEDURE Page: 14

#### **ATTACHMENT 2**

#### **GUIDELINES FOR SELECTION OF 2 YEARS OPERATION SPARE PARTS**

Spare parts for equipment are shown in the following tables:

- Table 1 Spare parts for machinery/packages.
- Table 2 Spare parts for electrical equipment
- Table 3 Spare parts for instruments
- Table 4 Spare parts for pressure vessels and heat exchangers
- Table 5 Spare parts for piping.





Title: SPARE PARTS PROCEDURE

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# TABLE 1 SPARE PARTS FOR MACHINERY / PACKAGES

Note 1: Please see the relevant engineering specifications of each equipment for recommended 2-years spares.

Note 2: Please see tables 2 and 3 of attachment-2 for the electrical and instrument spare parts requirements of machinery / packages for 2 -years.





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# TABLE 2 MINIMUM SPARE PART FOR ELECTRICAL EQUIPMENT

Item:	<u>Quantities</u>	
1) Switchgears:	tchgears: MV Fuses	
	Protecting and Flag Relay	2%
	Time Relay	2%
	Lamps	10%
	Space Heaters	10%
	L.V. Fuses	2%
	Auxiliary Relays	1%
	Moving Contacts	15%
	Fixed Contacts	15%
	Circuit Breakers(MCCB,M	CB) 10%
	Contactors	15%
	Metering	15%
	CT	20%
	PT	20%
2)Power Motors Control Center: L.V. Fuses		15%
	Time Delayed Relays	8%
	Lamps	10%
	Space Heaters 10%	
	Terminal Blocks 7%	
	Auxiliary relays	To be
	Contactors	determined later
	Thermal	in conjunction
	overload Relays	with the equipment vendor
	Isolators for each trip	21%
	Current Setting	11%





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	Motor Circuit Brakers							
	Complete Unit for Eacl	15%(min 1)						
	Type & Size(incoming							
	Moving Contacts 20%							
	Fixed Contacts	20%	⁄o					
	Metering	15%	15%					
	CT	209	<b>%</b>					
	PT	20%	<b>/</b> 0					
	Circuit Breaker	one per each	ch type					
3) Transformers:	Bucholz Relays	one each type	n type & size					
	Thermometer	10%	10%					
	Bushing HV/LV	509	0%					
	Measuring and cintrol d	evices 20°	20%					
	CT of natural resistor	10% (of each t	10% (of each type)					
4) Power Material:	a) Local Control Stations	s 5%	5%					
	b) Sockets 400V AC	10%	10%					
	c) Plugs 400V AC	10%						
5) Lighting Materials:	a) Switches	10%						
	b) Fuses	30%						
	c) Sockets(230 V, 24V)	10%	10%					
	d) Plugs(230 V, 24V)	10%	10%					
	e) Lighting Fixtures	109	10%					
	f) Ballast Lamps	5%	5%					
	g) Lamps	20%	o o					
	h) Portable 110V AC,50Hz with							
	transformer (ex-type)socket and plug 10%							
	i) hand amp 24V AC, 50	Hz (ex-type)						
6) Motors:								
No of Machines	1 2 3	4 5	more					
set of Bearing	1 1 1	2 2	40%					
Fan, terminal, blocks, space	ce heater (MV)per type		5%					





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7) UPS:						
	Fuses	30%				
	MCB(miniator circuit breake	r) 15%				
	SCR	30%				
	Signaling lamps and protection					
	device	15%				
	DIOD	10%				
	Transistor	30%				
	Control cards	one per each type				
	Batteries	5%				
	Isolator switch					
	(make before break)	one per each type				
8)Battery charger:						
	Fuse	30%				
	MCB	15%				
	SCR	30%				
	DIOD	10%				
	Signaling lamp	15%				
	Control cards	one per each type				
	Batteries	5%				
9)Telephoned system		*				
10) Paging system		*				
11) Radio system		*				
12) Fire alarm system		*				
13) Neutral grounding system		*				
14) Bus duct		*				

These are the spare parts required for two years operation. Vendor shall recommend the spares based on their experience.

(\*)The Quantities indicated are only preliminary estimation, so the firm quantities will be specified later in conjunction with recommendations of equipment vendors.

The quantities which shall be ordered by VENDOR shall be approved By OWNER.





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# TABLE 3 SPARE PARTS FOR INSTRUMENTS

<u>Item</u> Quantities

Flow Instruments

To be determined

Level Instruments

in conjunction with

the equipment Vendor

Temperature Instruments (based on Vendor's

experience on similar

Pressure Instruments type of plant)

Analyzers

Control Valves: Valve Bodies

None unless service

is corrosive or erosive.

For corrosive or erosive services, shall be determined in conjunction with

the equipment Vendor.

Valve Plugs 1 of each size/min.

15% or 1

Seat Rings 1 of each size/min.

25% or 1

Actuators 10% (min 1 per type / size)

Valve Stems 1 of each diameter.

These vary in length depending on valve size. Purchase the

longest of each dia.

These can be cut to

the correct size.





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Stem packings 3 boxes of each size

used/min. 20%

Grease 3 boxes of each type

used/min. 20%

Diaphragms 1 of each size used

min. 20%

Blank Orifice Plates

Dial Thermometers

Manual Loading Stations

**Instrument Air Filters** 

(Regulation sets)

Pressure Gauges

Pressure Switches

Plug-in Assemblies for Elect. Instr.

Plug-in Assemblies for Pneum. Instr. 10%

Seal, Condensate and Vent Pots (for all)

Solenoid Valves

Thermocouples

Thermowells

Signal Lights

Pneumatic relay and/or boosh(if any)

Valve Positioners 10%

I/P Convertes (for all)





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DCS/ESD/PLC (for each system the following items):

-I/O cards 5% for each type (min 1 for each type)

-Main cards one set

-Power supply (AC, if any ) one set

-Power supply (DC, if any) one set

-Barriers cards 5% for each type (min 1 for each type)

On-line gaschromatographs:

-Main mother board one set

-Column one per type





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# TABLE 4 SPARE PARTS FOR PRESSURE VESSELS & HEAT EXCHANGERS

<u>ITEM</u> <u>QUANTITIES</u>

1) Heat Exchangers-Shell and Tube

(U Type included)

- Tubes Straight tubes sufficient to retube the

largest bundle of each tube size and

material.

- Bolts and nuts (Special or Alloy) of each exchanger

minimum one set.

- Gaskets 200%

2) Pressure Vessels

- Gaskets 200%

- Bolts and nuts 10% (Special, Alloy or size 2" diam or

greater), minimum one set.

3) Air Cooled Exchangers

- Plugs Steel 1%; Non-ferrous 2%

(min. one number)

- Plug Gaskets 5% (min. one number)

-Cover plate gaskets 10%

-Tube support boxes 10% (min. one number)

4) Number of Air-fin Coolers Using Part. 1 2 3 4 5 6 7 or more

(i) V-Belts-Sheaves (Driven & Driver) 0 0 0 0 0 1

- Set of Belts 1 2 3 4 5 6 100%

(ii) Fan Shaft Bearing (Upper & Lower) 1 1 1 2 2 3 50% of No

of Air Fins

(iii) Speed Reducers (Gear Box) Shaft





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	and pinion								
	- Bearing Set	1	1		1	2	2	3	50% of No
	-								of Air Fins
	- O-Rings, Seals, Lock-washers, Lock	nut	S						
	(iv) Couplings – Complete Coupling,								
	-Flanges, Gaskets, Seals	1	1	1	1	1	1	1	1
	(v) Fan Assemblies	1	2	2	3	4	5	6	100% of No
									of Air Fins
	-Automatic Pitch Control								
	-Hub Assembly Parts Guide Bushing,								
	-Pithc Blocks, O-Rings, Clam Gasket	S							
	(vi) Bolt Assembles, Fork, Pins	1	2	2	3	4	5	6	100% of No of Air Fins
	(vii) Flexible Hose, Rotary Union	1	1	l	1	1	1	1	2
	(viii) Automatic or Manual Adjustments:								
	- Blade Retention Clamps, Pitch,	1	1	l	1	2	2	2	30% of No
	•								of Air Fins
	Change Forks, Puch Rod, Stub,(with pil	lot	tu	be	es)	),E	Bea	rir	ng
	Retainer Rings								
	(ix) Spring Housing Gasket, Diaphragm,	1	1	1	1	1	2	2	20% of No
	Blade Retainer Ring, Thrust								of Air Fins
	cover Gasket								
	(x) Hub Assembly with Blades	0	(	)	0	0	0	0	1 (b)
	(*) NOTES								
	(a) Quantities shown are for each size and	typ	эe	0	fŗ	oar	t		
	(b) Twenty units or more								
	(c) The parts listed are the principal parts of	nl	y.	С	)th	er	pa	arts	s shall be
	considered for recommendation in quan	ntit	tie	S	co	ns	ist	en	t with the

above table.





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5) Plate type Exchangers

Plat gasket 100%

Flow Plate 10%

Nozzle Gasket 200%

Glue (1 Kg. Pot)

Special spanner tool 1 for each size/type





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# TABLE 5 SPARE PARTS FOR PIPING

<u>Item</u> <u>Quantities</u>

Valves up to 1 ½" 5% for each size, type and material

complete units

Valves from 2" to 6" 2% (minimum 2 pieces) for each size, type

and material

Valves above 6" to 10" 1 piece for each size, type and material

complete units

Valves above 10" 1 only if installed valves quantity is more than 30

Valves up to 10"

Gland packing and

bonnet gasket 10%

Valves from 2" to 10 2 for each type, size and material set of

changeable inner parts

Valves above 10" 1 for each type, size and material

Set interchangeable

inner parts: bonnet gasket and

stem packing

Piping gaskets and bolts

set for each size and type 10%





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#### **ATTACHMENT 3**

# GUIDELINES FOR THE COMPILATION OF SPARE PARTS INTERCHANGEABILITY RECORD (SPIR)

The manufacturer/supplier shall complete the following parts of th SPIR form as per listed sequence and in the English language:

- Line 1: PLANT registration/item number or tag number of equipment/instruments, etc. as stated on requisitions and/or Purchase Orders.
- Line 2: Mode, type or other identification of eqipment/instruments, etc. ordered.
- Line 3: Serial number of each equipment/instruments, etc. ordered.
- Line 6: Purchase Order number reference of equipment/instruments, etc.
- Line 6a: Unit of measure, i.e. No., set, pair, kg,roll, etc.
- Line 4: Number of identical equipment, etc. of particular model or type being supplied against Purchase Order number mentioned under line 6.
- Line 8: Parts description of all component parts considered by supplier as being required for maintenance of equipment, etc. listed in lines 1, 2 and 3. However, all items specified in the appropriate equipment list shall be shown separately.
- Col. 9: Drawing number/part number as per supplier's parts list or drawing.
- Col. 10: Part identification number shoeing interchangeability within equipment manufacturer's organization.
- Note: Identical parts, regardless of whether they have the same part number or drawing number, should be shown only once (see also line 5).
- Col.11: Material specification of parts listed in column 8.
- Line 5: Enter in appropriate square the nuber of parts (listed in column) fitted in each applicable unit. For groups of identical units, denote quantity per unit below quantity shown in line 4.
- Col. 7: Total number of identical parts listed in colimn 8 for all equipment, etc. For identical units multiply quantity in line 5 by number in same column in line 4 and enter overall total of each line in column 7.





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- Col.12: Total spar parts recommended for 2 years operation and commissioning period.
- Col.18: Unit price (up to two decimals) for recommended spare parts of column 12.
- Col.20: Original identification number for all items of third party manufacture (bought-out items) such as: ball/-roller bearings, mechanical seals, coplings, bearing lock nuts, bearing lock washers, V-bels, bolts/nuts, gaskets, O-rings, and the like. These items should be fully identified by manufacturers' numbers, types, sizes, etc.
- V for: Vital equipment, a breakdown of which would mean an immediate and serious interruption of vital operations in field or plant and with which no risk in the ordering and stocking of spare parts can be justified.
- E for: Essential equipment, engaged in primary operations, but with which a calculated risk can be taken in ordering and stocking of spare parts.
- A for: Auxiliary, general purpose and stand-by equipment, for secondary operations, the temporary lack of spare parts would not have a serious effect.
   Under this heading also comes the equipment of which there is a large number of units in used, thus ensuring a sufficient degree of protection in case of failure of one or more units.

# The Owner MESC project team should complete the following part of the SPIR form

- Col.16: For allocation of the final MESC number.
- Col.17: For the classification of spare parts, i.e.:
- C for: Parts wearing out or deteriorating during normal operations, thus shown a fairly regular consumption.
- Q for: Parts not normal stocked, but ordered on request only.
- I for: Insurance items.
- O for: Temporary code number.

# THE VENDOR SHALL COMPLETE THE FOLLOWING PART OF THE SPIR FORM:

Col.13: VENDOR'S recommended spare parts for 2 years operation.





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- Col.14: VENDOR'S recommended spare parts for the precommissioning, commissioning and start-up period.
- Col.22: This column has to be filled out for the respective parts purchase order-item reference. This number should be tagged to the respective material fro easy identification upon receipt at site.
- Col.19: Total price (up to 2 decimals) of the spare parts for 2 years operation and the commissioning period based upon the quantities approved by the OWNER'S Project Engineer (see column 15)

NOTE: Columns 15, 17 and 21 should be left blank, these are for OWNER's use.

THE OWNER'S PROJECT ENGINEER SHOULD COMPLETE THE FOLLOWING PART OF SPIR FORM:

Col.15: Final quantity to be ordered and Approved by the OWNER's Project Engineer.

Col.21: This column has to be used to indicate the equipment classe, i.e.

#### **IMPORTANT NOTE:**

The necessary provisions shall be made to fix the prices of spare parts for all equipment and materials for future purchasig of the spare parts by OWNER more than which shall be purchased by VENDOR for two years operations of the PLANT all EQUIPMENT AND MATERIALS for future purchasing of the spare

#### **ATTACHMENT 4**





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