

LHT Hot Oil Heat Transfer Furnace F9601		Data/requisition sheet for FIRED HEATERS		www.AllSurplus.com/asset/6/27040	
PURCHASER / OWNER :		DONG Oilpipe A/S		ITEM NO. : F-9601	
SERVICE :		HOT OIL FURNACE		LOCATION : Fredericia, Denamrk	
1	* UNIT:	HOT OIL FURNACE		*NUMBER REQUIRED: 1 (One)	
2	MANUFACTURER:			REFERENCE:	
3	TYPE OF HEATER:	Cylindrical type with top mounted CVB and Liquid Coupled APH System			
4	* TOTAL HEATER ABSORBED DUTY, MW. :	19.355			
5	PROCESS DESIGN CONDITIONS				
6	* OPERATING CASE	DESIGN CASE			
7	HEATER SECTION	RC		CVB-1/2/3	
8	* SERVICE				
9	HEAT ABSORPTION, MW.	13.039		6.316	
10	* FLUID	HOT OIL (Therminol XP)			
11	* FLOW RATE, kg/h.	522258			
12	* FLOW RATE, m³/h.				
13	* PRESSURE DROP, ALLOWABLE (FOULED), bar.	4.5			
14	PRESSURE DROP, CALCULATED (CLEAN), bar.	2.2		2.0	
15	* AVG. RAD. SECT. FLUX DENSITY, ALLOWABLE, W/m².	-		-	
16	AVG. RAD. SECT. FLUX DENSITY, CALCULATED, W/m².	32746		-	
17	MAX. RAD. SECT. FLUX DENSITY, W/m².	92996		-	
18	CONV. SECT. FLUX DENSITY, (average, BARE TUBE), W/m².	-		21710	
19	* VELOCITY LIMITATION, m/s.	-		-	
20	PROCESS FLUID MASS VELOCITY, kg/s-m². (max.)	-		-	
21	* MAXIMUM ALLOW. / CALC. INSIDE FILM TEMPERATURE, °C.	330	255	330	217
22	* FOULING FACTOR, m²-K/W.	0.00017		0.00017	
23	* COKING ALLOWANCE, mm.	-		-	
24	* TOTAL ACID NUMBER, mg KOH/g oil.	0.2		0.2	
25	* SULPHUR, ppm.	< 10		< 10	
26	INLET CONDITIONS :				
27	* TEMPERATURE, °C.	175		157.3	
28	* PRESSURE, barg	10.0		12.0	
29	* LIQUID FLOW, kg/h.	522258		522258	
30	* VAPOR FLOW, kg/h.	-		-	
31	* LIQUID DENSITY, (kg/m³)	778.12		790	
32	* VAPOR MOLECULAR WEIGHT / DENSITY (kg/m³)	-	-	-	-
33	* VISCOSITY, (LIQUID / VAPOR), cP.	1.117	-	1.333	-
34	* SPECIFIC HEAT, (LIQUID / VAPOR), kJ/kg-K.	2.5	-	2.429	-
35	* THERMAL CONDUCTIVITY, (LIQUID / VAPOR), W/m-K.	0.116	-	0.118	-
36	* MIXTURE ENTHALPY, kJ/kg	401.78		358.2	
37	* SUPERFICIAL VELOCITY, (LIQUID / VAPOR), m/s	3.77	-	3.72	-
38	OUTLET CONDITIONS :				
39	* TEMPERATURE, °C.	210		175	
40	* PRESSURE, barg	7.8		10.0	
41	* LIQUID FLOW, kg/h.	522258		522258	
42	* VAPOR FLOW, kg/h.	-		-	
43	* LIQUID DENSITY, (kg/m³)	754.2		778.12	
44	* VAPOR MOLECULAR WEIGHT / DENSITY (kg/m³)	-	-	-	-
45	* VISCOSITY, (LIQUID / VAPOR), cP.	0.826	-	1.117	
46	* SPECIFIC HEAT, (LIQUID / VAPOR), kJ/kg-K.	2.634	-	2.5	
47	* THERMAL CONDUCTIVITY, (LIQUID / VAPOR), W/m-K.	0.114	-	0.116	
48	* MIXTURE ENTHALPY, kJ/kg	491.7		401.78	
49	* SUPERFICIAL VELOCITY, (LIQUID / VAPOR), m/s	3.9	-	3.77	
50	REMARKS AND SPECIAL REQUIREMENTS :				
51	* DISTILLATION DATA OR FEED COMPOSITION:				
52	* SHORT TERM OPERATING CONDITIONS:				
53					
54	NOTES:				
55	Notes: see sheet 7.				
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Data/requisition sheet for											
LHT Hot Oil Heat Transfer Furnace F9601				FIRED HEATERS				www.AllSurplus.com/asset/27040			
MECHANICAL DESIGN CONDITIONS											
1	* PLOT LIMITATIONS:				*STACK LIMITATIONS:				Max. height of unit limited to 42 m	REV	
2	* TUBE LIMITATIONS:				*NOISE LIMITATIONS:						
3	* STRUCTURAL DESIGN DATA: WIND VELOCITY:				*WIND OCCURANCE:						
4	SNOW LOAD:				*SEISMIC ZONE:						
5	* MIN. / NORMAL / MAX. AMBIENT AIR TEMPERATURE, °C.:				-20 / 24 / 30		*RELATIVE HUMIDITY,%:		85		
6	HEATER SECTION :			RC		CVB-1		CVB-2		CVB-3	
7	SERVICE :			Hot Oil		Hot Oil		Hot Oil		Hot Oil	
8	COIL DESIGN :										
9	* DESIGN BASIS: TUBE WALL THICKNESS (CODE OR SPEC.)			ISO 13705							
10	RUPTURE STRENGTH (MINIMUM OR AVERAGE)										
11	* STRESS-TO-RUPTURE BASIS, h.										
12	* DESIGN PRESSURE, ELASTIC / RUPTURE, bar.g.			22.5		22.5		22.5		22.5	
13	* DESIGN FLUID TEMPERATURE, °C.										
14	* TEMPERATURE ALLOWANCE, °C.										
15	* CORROSION ALLOWANCE, TUBES / FITTINGS, mm.			3		3		3		3	
16	HYDROSTATIC TEST PRESSURE, bar.g.										
17	* POST WELD HEAT TREATMENT (YES OR NO)										
18	* PERCENT OF WELDS FULLY RADIOGRAPHED										
19	MAXIMUM (CLEAN) TUBE METAL TEMPERATURE, °C.			287		245		222		195	
20	DESIGN TUBE METAL TEMPERATURE, °C.			365		365		365		365	
21	INSIDE FILM COEFFICIENT, W/m²-K.			2190		2030		1990		1920	
22	COIL ARRANGEMENT : see note										
23	TUBE ORIENTATION: VERTICAL OR HORIZONTAL			Vertical		Horizontal		Horizontal		Horizontal	
24	* TUBE MATERIAL (ASTM SPECIFICATION AND GRADE)			A106 Gr.B		A106 Gr.B		A106 Gr.B		A106 Gr.B	
25	TUBE OUTSIDE DIAMETER, mm.			114.3		114.3		114.3		114.3	
26	TUBE WALL THICKNESS, (AVERAGE) mm.			6.02		6.02		6.02		6.02	
27	NUMBER OF FLOW PASSES			6		6		6		6	
28	NUMBER OF TUBES / NUMBER OF TUBE ROWS			84		60		36		84	
29	NUMBER OF TUBES PER ROW (CONVECTION SECTION)			-		12		12		12	
30	OVERALL TUBE LENGTH, mm. (straight)			13000		4500		4500		4500	
31	EFFECTIVE TUBE LENGTH, mm.			13200		4500		4500		4500	
32	BARE TUBES: NUMBER			84		60		-		-	
33	TOTAL EXPOSED SURFACE, m².			398		97		-		-	
34	EXTENDED SURFACE TUBES: NUMBER			-		-		36		84	
35	TOTAL EXPOSED SURFACE, m².			-		-		369		1475	
36	TUBES LAYOUT (IN LINE OR STAGGERED)			-		Staggered		Staggered		Staggered	
37	TUBE SPACING, CENT. TO CENT. : HORIZONTAL, mm.			203		203		203		203	
38	DIAGONAL, mm.			-		-		-		-	
39	VERTICAL, mm.			-		176		176		176	
40	SPACING TUBE CENT. TO FURNACE WALL, mm.			MP		-		-		-	
41	CORBELS (YES OR NO)			-		Yes		Yes		Yes	
42	CORBEL WIDTH, mm.			-		MP		MP		MP	
43	DESCRIPTION OF EXTENDED SURFACE :										
44	* TYPE: (STUDS) (SERRATED FINS) (SOLID FINS)			-		-		Solid fins		Solid fins	
45	MATERIAL			-		-		Carbon Steel		Carbon Steel	
46	DIMENSIONS: HEIGHT, mm.			-		-		19.1		25.4	
47	DIAMETER / THICKNESS, mm.			-		-		2.0		2.0	
48	SPACING FINS/m			-		-		118		157	
49	MAXIMUM TIP TEMPERATURE, (CALCULATED), °C.			-		-		286		241	
50	EXTENSION RATIO (TOTAL AREA / BARE AREA)			-		-		6.3		10.9	
51	PLUG TYPE HEADERS :										
52	* TYPE										
53	* MATERIAL (ASTM SPECIFICATION AND GRADE)										
54	NOMINAL RATING										
55	* LOCATION (ONE OR BOTH ENDS)										
56	* WELDED OR ROLLED JOINT										
57	NOTES:										
58	Notes: see sheet 7.										
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LHT Hot Oil Heat Transfer Furnace F9601			Data/requisition sheet for FIRIED HEATERS		www.AllSurplus.com/asset/6/27040	
MECHANICAL DESIGN CONDITIONS (Cont'd)						
1	HEATER SECTION		RC	CVB-1	CVB-2	CVB-3
2	SERVICE		Hot Oil	Hot Oil	Hot Oil	Hot Oil
3	RETURN BENDS :					
4	TYPE		welded	welded	welded	welded
5	* MATERIAL (ASTM SPECIFICATION AND GRADE)		ASME B16.9	ASME B16.9	ASME B16.9	ASME B16.9
6	NOMINAL RATING OR SCHEDULE		SCH 40	SCH 40	SCH 40	SCH 40
7	LOCATION (F. B. = FIRE BOX, H. B. = HEADER BOX)		F.B.	H.B.	H.B.	H.B.
8	TERMINALS AND OR MANIFOLDS :					
9	* TYPE (BEV. = BEVELED, MAN. = MANIFOLD, FLG. = FLANGED)		FLG.	-	-	FLG.
10	* INLET: MATERIAL (ASTM SPECIFICATION AND GRADE)		-	-	-	A106 Gr. B
11	SIZE		-	-	-	MP
12	SCHEDULE OR THICKNESS		-	-	-	MP
13	NUMBER OF TERMINALS		-	-	-	MP
14	FLANGE MATERIAL (ASTM SPEC. AND GRADE)		-	-	-	MP
15	FLANGE SIZE AND RATING		-	-	-	MP
16	* OUTLET: MATERIAL (ASTM SPECIFICATION AND GRADE)		A106 Gr. B	-	-	-
17	SIZE		MP	-	-	-
18	SCHEDULE OR THICKNESS		MP	-	-	-
19	NUMBER OF TERMINALS		MP	-	-	-
20	FLANGE MATERIAL (ASTM SPEC. AND GRADE)		MP	-	-	-
21	FLANGE SIZE AND RATING		MP	-	-	-
22	* MANIFOLD TO TUBE CONN. (WELDED, EXTRUDED, ETC.)		MP	-	-	-
23	MANIFOLD LOCATION (INSIDE OR OUTSIDE HEADER BOX)		Outside	-	-	-
24	CROSSOVERS :					
25	* WELDED OR FLANGED		-	Welded	-	-
26	* PIPE MATERIAL (ASTM SPECIFICATION AND GRADE)		-	A106 Gr. B	-	-
27	PIPE SIZE		-	4"	-	-
28	PIPE SCHEDULE OR THICKNESS		-	SCH 40	-	-
29	* FLANGE MATERIAL		-	-	-	-
30	FLANGE SIZE / RATING		-	-	-	-
31	* LOCATION (INTERNAL / EXTERNAL)		-	external	-	-
32	FLUID TEMPERATURE, °C.		-	-	-	-
33	TUBE SUPPORTS :					
34	LOCATION (ENDS, TOP, BOTTOM)		top	ends	ends	ends
35	MATERIAL (ASTM SPECIFICATION AND GRADE)		MP	MP	MP	MP
36	DESIGN METAL TEMPERATURE, °C.		MP	MP	MP	MP
37	THICKNESS, mm.			MP	MP	MP
38	INSULATION: THICKNESS, mm.			MP	MP	MP
39	MATERIAL			MP	MP	MP
40	ANCHOR (MATERIAL AND TYPE)			MP	MP	MP
41	INTERMEDIATE TUBE SUPPORTS :					
42	* MATERIAL (ASTM SPECIFICATION AND GRADE)		-	MP	MP	MP
43	DESIGN METAL TEMPERATURE, °C.		-	MP	MP	MP
44	THICKNESS, mm.		-	MP	MP	MP
45	SPACING, m.		-	MP	MP	MP
46	TUBE GUIDES :					
47	LOCATION		free hanging	-	-	-
48	* MATERIAL		MP	-	-	-
49	TYPE / SPACING		-	-	-	-
50	HEADER BOXES :					
51	LOCATION:	both ends CVB	HINGED DOOR / BOLTED PANEL: bolted			
52	CASING MATERIAL :	MP	THICKNESS, mm.: MP			
53	LINING MATERIAL:	MP	THICKNESS, mm.: MP			
54	ANCHOR (MATERIAL AND TYPE):	MP				
55	NOTES :					
56	Notes: see sheet 7.					
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MECHANICAL DESIGN CONDITIONS (Cont'd)

1	REFRACTORY DESIGN BASIS :						REV	
2	* AMBIENT, °C.:		WIND VELOCITY, m/s.:		CASING TEMP., °C.:			
3	EXPOSED VERTICAL WALLS :							
4	LINING THICKNESS, mm.:	MP	HOT FACE TEMPERATURE, DESIGN, °C.	MP	CALCULATED, °C.:	MP		
5	WALL CONSTRUCTION:	MP						
6								
7	ANCHOR (MATERIAL & TYPE):	MP						
8	CASING MATERIAL:	MP	THICKNESS, mm.	MP	TEMPERATURE, °C.:	MP		
9	SHIELDED VERTICAL WALLS :							
10	LINING THICKNESS, mm.:	MP	HOT FACE TEMPERATURE, DESIGN, °C.	MP	CALCULATED, °C.:	MP		
11	WALL CONSTRUCTION:	MP						
12								
13	ANCHOR (MATERIAL & TYPE):	MP						
14	CASING MATERIAL:	MP	THICKNESS, mm.	MP	TEMPERATURE, °C.:	MP		
15	ARCH :							
16	LINING THICKNESS, mm.:	MP	HOT FACE TEMPERATURE, DESIGN, °C.	MP	CALCULATED, °C.:	MP		
17	WALL CONSTRUCTION:	MP						
18								
19	ANCHOR (MATERIAL & TYPE):	MP						
20	CASING MATERIAL:	MP	THICKNESS, mm.	MP	TEMPERATURE, °C.:	MP		
21	FLOOR :							
22	LINING THICKNESS, mm.:	MP	HOT FACE TEMPERATURE, DESIGN, °C.	MP	CALCULATED, °C.:	MP		
23	FLOOR CONSTRUCTION:	MP						
24								
25	CASING MATERIAL:	MP	THICKNESS, mm.	MP	TEMPERATURE, °C.:	MP		
26	* MINIMUM FLOOR ELEVATION, m:	MP	FREE SPACE BELOW PLENUM, m.:	MP				
27	CONVECTION SECTION :							
28	LINING THICKNESS, mm.:	MP	HOT FACE TEMPERATURE, DESIGN, °C.	MP	CALCULATED, °C.:	MP		
29	WALL CONSTRUCTION:	MP						
30								
31	ANCHOR (MATERIAL & TYPE):	MP						
32	CASING MATERIAL:	MP	THICKNESS, mm.	MP	TEMPERATURE, °C.:	MP		
33	INTERNAL WALL :							
34	TYPE:	-	MATERIAL:	-				
35	DIMENSION, HEIGHT / WIDTH, mm							
36	DUCTS :	FLUE GAS			COMBUSTION AIR			
37	LOCATION	MP			MP			
38	SIZE, m. OR NET FREE AREA, m ² .	MP			MP			
39	CASING MATERIAL	MP			MP			
40	CASING THICKNESS, mm.	MP			MP			
41	LINING: INTERNAL / EXTERNAL	MP			MP			
42	THICKNESS, mm.	MP			MP			
43	MATERIAL	MP			MP			
44	ANCHOR (MATERIAL & TYPE)	MP			MP			
45	CASING TEMPERATURE, °C.	MP			MP			
46	PLENUM CHAMBER (AIR) :							
47	TYPE OF PLENUM (COMMON OR INTEGRAL): individual windbox							
48	CASING MATERIAL:		THICKNESS, mm.		SIZE, mm.:			
49	LINING MATERIAL:				THICKNESS, mm.:			
50	ANCHOR (MATERIAL & TYPE):							
51	NOTES :							
52	Notes: see sheet 7.							
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MECHANICAL DESIGN CONDITIONS (Cont'd)

1	STACK OR STACK STUB:					REV		
2	NUMBER: 1	SELF-SUPPORTED OR GUYED: MP	LOCATION: Top of CVB					
3	CASING MATERIAL: MP				*MINIMUM THICKNESS, mn MP			
4	INSIDE LINING DIAMETER, m. MP				STACK LENGTH, m.: MP			
5	LINING MATERIAL: MP				THICKNESS, mm.: MP			
6	ANCHOR (MATERIAL AND TYPE): MP							
7	* EXTENT OF LINING: MP	INTERNAL OR EXTERNAL: MP						
8	DESIGN FLUE GAS VELOCITY, m/s.: 10-15	FLUE GAS TEMPERATURE., °C.: MP						
9	DAMPERS:							
10	LOCATION	MP						
11	TYPE (CONTROL, TIGHT SHUT-OFF, ETC.)	MP						
12	MATERIAL: BLADE	MP						
13	SHAFT	MP						
14	MULTIPLE / SINGLE LEAF	MP						
15	* PROVISION FOR OPERATION (MANUAL OR AUTOMATIC)	MP						
16	* TYPE OF OPERATOR (CABLE OR PNEUMATIC)	MP						
17	PLATFORMS:							
18	* LOCATION	NUMBER	WIDTH	LENGTH / ARC	STAIRS/LADDER	ACCESS FROM		
19	MP	MP	MP	MP	MP	MP		
20								
21								
22								
23								
24	* TYPE OF FLOORING:							
25	DOORS:							
26	TYPE: see note	NUMBER	LOCATION	SIZE	BOLTED/HINGED			
27	* ACCESS	MP	MP	MP	MP			
28	MP							
29	* OBSERVATION							
30	MP							
31	* TUBE REMOVAL							
32	MP							
33	MISCELANEOUS: see note							
34	INSTRUMENT CONNECTIONS		NUMBER	SIZE	TYPE			
35	* COMBUSTION AIR:	TEMPERATURE	MP	MP	MP			
36		PRESSURE	MP	MP	MP			
37	*	HYDRO CARBON ANALYSER see note	1	MP	MP			
38	* FLUE GAS:	TEMPERATURE	MP	MP	MP			
39		PRESSURE	MP	MP	MP			
40	* FLUE GAS SAMPLE		MP	MP	MP			
41	* SNUFFING STEAM / PURGE		MP	MP	MP			
42	* O ₂ ANALYSER		1	MP	MP			
43	* CO AND NO _x ANALYSER		MP	MP	MP			
44	* VENTS / DRAINS		MP	MP	MP			
45	* PROCESS FLUID TEMPERATURE		MP	MP	MP			
46	* TUBESKIN THERMOCOUPLES		N/A					
47	* PAINTING REQUIREMENTS: MP							
48								
49	* INTERNAL COATING:	MP						
50	* GALVANIZING REQUIREMENTS:	MP						
51	ARE PAINTERS TROLLEY AND RAIL INCLUDED? (YES OR NO): MP							
52	* SPECIAL EQUIPMENT:	SOOTBLOWERS:	NO					
53		AIR PREHEATER:	see Air PreHeater (APH) datasheets					
54		FAN(S):	see Forced Draught (FD) and Induced Draught (ID) datahsteets					
55		OTHER:	-					
56	NOTES:							
57	Notes: see sheet 7.							
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FIRED HEATERS**NOTES**

		REV
1	General notes:	
2	- MP : Manufacturers Proposal (always incorporating applicable specifications).	
3	- CVB: ConVection Bank, X-over: cross over CVB to RC, RC: Radiant cell(s), FGC: Flue Gas Cooler; APH: Air PreHeater	
4	- refer to "Technical Specification" for design basis and margins used.	
5		
6	Specific notes:	
7	- sheet 2: line 19: refer to Burner Datasheet	
8	- sheet 2: line 38: refer to Burner Datasheet	
9	- sheet 3: line 22: refer to arrangement drawing RC and arrangement drawing CVB; see Technical Specification	
10		
11		
12	- sheet 6: line 29: CVB shall have individual section inspection doors in all cases	
13	- sheet 6: line 33: refer to applicable PEFS	
14	- sheet 6: line 37: combustion air to be analysed for presence of hydro carbons downstream of APH	
15	- sheet 6: line 45: refer to arrangement drawing RC; see Technical Specification	
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PURCHASER / OWNER :		DONG Oilpipe A/S		ITEM NO. :		F-9601	
SERVICE :		HOT OIL FURNACE		LOCATION:		Fredericia, Denmark	

1	GENERAL DATA			REV
2	TYPE OF HEATER	Vertical Cylinder		
3	* ALTITUDE ABOVE SEA LEVEL, m.	25.25		
4	* AIR SUPPLY:			
5	AMBIENT / PREHEATED AIR / GAS TURBINE EXHAUST	Preheated Air		
6	(PRE-HEAT) TEMPERATURE, °C. (MIN. / MAX. / DESIGN)	-15 / 61 / 100		
7	RELATIVE HUMIDITY, %.	80%-88%		
8	DRAFT TYPE: FORCED / NATURAL / INDUCED	Forced		
9	DRAFT AVAILABLE: ACROSS BURNER, Pa.	MP		
10	ACROSS PLENUM, Pa.	MP		
11	* REQUIRED TURNDOWN	1 to 6		
12	BURNER WALL SETTING THICKNESS, mm.	MP		
13	HEATER CASING THICKNESS, mm.	MP		
14	FIREBOX HEIGHT, m.	MP		
15	TUBE CIRCLE DIAMETER, mm.	5440		
16	BURNER DATA			
17	MANUFACTURER	MP		
18	TYPE OF BURNER	Low NOx Forced Draught Burner		
19	MODEL / SIZE	MP	-	
20	DIRECTION OF FIRING	Vertical	-	
21	LOCATION (ROOF / FLOOR / SIDEWALL)	Floor	-	
22	NUMBER REQUIRED	6 (Six)	-	
23	MINIMUM DISTANCE BURNER CENTERLINE, mm.:		-	
24	TO TUBE CENTERLINE (HORIZONTAL)	1470	-	
25	TO ADJACENT BURNER CENTERLINE (HORIZONTAL)	600	-	
26	TO UNSHIELDED REFRACTORY (HORIZONTAL)	MP	-	
27	BURNER CIRCLE DIAMETER, mm.	2500		
28	* PILOTS:	see note		
29	NUMBER REQUIRED	1 (one) per burner		
30	TYPE	MP		
31	IGNITION METHOD	sparc		
32	FUEL	Fuel Gas/ Back-up fuel		
33	FUEL PRESSURE, barg.	MP		
34	CAPACITY, MW.	~ 0.1		
35	OPERATING DATA			
36	* FUEL	Fuel Gas	-	
37	HEAT RELEASE PER BURNER, MW. (LHV)			
38	DESIGN	3.860	-	
39	NORMAL	3.510	-	
40	MINIMUM	0.643	-	
41	* EXCESS AIR @ DESIGN HEAT RELEASE, %. (at 50-100% duty)	10%		
42	AIR TEMPERATURE, °C.	61		
43	DRAFT (AIR PRESSURE) LOSS, Pa.			
44	DESIGN	MP		
45	NORMAL	MP		
46	MINIMUM	MP		
47	FUEL PRESSURE REQUIRED @ BURNER, bar.g.	MP	-	
48	FLAME LENGTH @ DESIGN HEAT RELEASE, m.	< 9		
49	FLAME SHAPE (ROUND, FLAT, ETC.)	Round		
50	ATOMIZING MEDIUM / OIL RATIO, kg/kg.	-	-	
51	NOTES:			
52	Note line 28: see Technical Specification			
53				
54				
55				
56				
57				

BURNER DATA SHEET API STANDARD 560		SI UNITS					
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PURCHASER / OWNER :		DONG Oilpipe A/S		ITEM NO. :		E-96xx / E-96yy			
SERVICE :		HOT OIL FURNACE		LOCATION :		Fredericia, Denamrk			
1	LHT Hot Oil Heat Transfer Furnace F9601			FLUE GAS COOLER (E-96xx)		AIR PREHEATER (E-96yy)		REV	
2	MANUFACTURER:			MP		MP			
3	TYPE			LIQUID COUPLED APH SYSTEM		LIQUID COUPLED APH SYSTEM			
4	MODEL			MP		MP			
5	NUMBER REQUIRED			1 (One)		1 (One)			
6									
7	PERFORMANCE DATA								
8	OPERATING CASE			Design					
9	HEAT TRANSFER FLUID TYPE			HOT OIL see note					
10				INLET	OUTLET	INLET	OUTLET		
11	FLOW RATE, kg/h			20340		20340			
12	TEMPERATURE, °C.			130	157.3	157.3	130		
13	PRESSURE, barg			MP	7.8 (Hold)	12	MP		
14	LIQUID DENSITY, kg/m³			810	790	790	810		
11	LIQUID VISCOSITY, cP			2.07	1.33	1.33	2.07		
12	LIQUID SPECIFIC HEAT, kJ/kg.K			2.3	2.43	2.43	2.3		
13	LIQUID THERMAL CONDUCTIVITY, W/m.K			0.118	0.116	0.118	0.118		
14	SUPERFICIAL VELOCITY, m/s			MP		MP			
15	PRESSURE DROP ALLOWABLE, bar			1.5		1.5			
16	CALCULATED, bar			MP		MP			
17	FOULING RESISTANCE, m²-K/W			0.00017		0.00017			
18				FLUE GAS		COMBUSTION AIR			
19	FLOW RATE, kg/h			29970		28287			
20	TEMPERATURE, °C.			183.5	142.4	15	61.1		
21	PRESSURE, barg			MP	MP	MP	MP		
22	VAPOR DENSITY, kg/m³			MP	MP	MP	MP		
23	VAPOR VISCOSITY, cP			MP	MP	MP	MP		
24	VAPOR SPECIFIC HEAT, kJ/kg.K			MP	MP	MP	MP		
25	VAPOR THERMAL CONDUCTIVITY, W/m.K			MP	MP	MP	MP		
26	SUPERFICIAL VELOCITY, m/s			MP	MP	MP	MP		
27	PRESSURE DROP ALLOWABLE, bar.			MP		MP			
28	CALCULATED, bar.			MP		MP			
29	TOTAL HEAT EXCHANGED, MW			0.37		0.37			
30	FLUE GAS COMPOSITION, mole%: O₂			1.8		-			
31	N₂			72.3		-			
32	H₂O			14.5		-			
33	CO₂			10.50		-			
34	Ar			0.9		-			
35	SOx			8.3 ppmv		-			
36	TOTAL			100.00		-			
37	FLUE GAS ACID DEW POINT TEMPERATURE, °C.			109		-			
38	* MINIMUM METAL TEMPERATURE: ALLOWABLE, °C.			124		-			
39	CALCULATED, °C.			MP		-			
40	MISCELLANEOUS								
41	* MINIMUM AMBIENT AIR TEMPERATURE, °C.			-15					
42	* SITE ELEVATION ABOVE SEA LEVEL, m.			25.25					
43	* RELATIVE HUMIDITY, %.			85					
44	EXTERNAL COLD AIR BY - PASS (YES / NO)			YES					
45	COLD END THERMOCOUPLES (YES / NO) / NO. REQUIRED.			NO					
46	ACCESS DOORS : NUMBER / SIZE / LOCATION			MP					
47	INSULATION (INTERNAL / EXTERNAL):			MP					
48	* CLEANING MEDIUM: STEAM OR WATER			MP					
49	PRESSURE, bar.g.			MP					
50	TEMPERATURE, °C.			MP					
51	* LEAK TEST			-					
52	AIR LEAKAGE (GUARANTEED), %.			-					
53	NOTES: (ALL DATA ON PER UNIT BASIS)								
54	General note: burner system includes 10% margin on top of Design Cases. APH itself shall be rated for Design Cases only;								
55	i.e. no margin to be applied on APH thermal rating. However, pressure drop over APH including margin								
56	shall be calculated for fan rating purposes.								
57	Note line 9: Therminol XP; maximum allowable Hot Oil film temperature 330°C.								
58									
59									
60									
61									
62									
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AIR PREHEATER DATA SHEET				DATE	MADE BY	CHECK.	APPR.	SHEET	REV
SHELL GLOBAL SOLUTIONS				04/02/2011	EK	EK	LG	15 OF 15	1

EMISSION REQUIREMENTS

1	FIREBOX TEMPERATURE, °C.	784
2	* NOx * mg / Nm ³	106
3	* CO * mg / Nm ³	123
4	UHC * mg / Nm ³	N.A.
5	* PARTICULATES * mg / Nm ³	5
6	* SOx * mg / Nm ³	50
7		
8	* CORRECTED TO 3% Oxygen	
9	NOTES:	
10		
11	Note sheet 9: line 48: The total noise emitted by the hot oil furnace package including all ancillary units shall not exceed	
12	the total A-weighted sound power level LWA = 80 dB(A) in any operating condition within the design range.	
13	The total sound power level is the sum of the sound power levels of all accompanying sound sources.	
14	See Technical Specification.	
15	Note Sheet 9: Line 1: The normal fuel used will be a mixture of LP Fuel & HP FG	
16	Note Sheet 9: Line 7: The burner shall be able to fire fuels from 100% LP Fuel (base case) to 100% HP FG.	
17	Note Sheet 9: Line 8: All fuel gases shall be supplied to common KO drum	
18		
19	Composition (wt%) of Fuel gases to be used in the burners	
20		
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	LP FG	LP Fuel	HP FG	Evaporated C3
	(startup fuel)	(Base case)		
CH4	15.35	6.98	4.05	0.00
C2H6	15.70	17.13	42.68	0.00
C3H8	18.70	44.66	32.40	100.00
n-C4H10	30.77	25.59	16.64	0.00
n-C5H12	16.78	2.05	0.14	0.00
n-C6H14	0.00	0.27	0.00	0.00
N2	0.21	0.00	0.00	0.00
O2	0.00	0.00	0.00	0.00
CO2	0.17	3.04	3.88	0.00
H2O	0.00	0.28	0.18	0.00
CO	0.00	0.00	0.00	0.00
H2	2.31	0.00	0.00	0.00
H2S	0.02	0.01	0.03	0.00
Methyl Mercaptan	0.00	0.00	0.01	0.00
Ethly Mercaptan	0.00	0.00	0.00	0.00
Propyl Mercaptan	0.00	0.00	0.00	0.00
C5H10	0.00	0.00	0.00	0.00
NH3	0.00	0.00	0.00	0.00
Total	100.00	100.00	100.00	100.00

BURNER DATA SHEET
API STANDARD 560

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PURCHASER / OWNER : DONG Oilpipe A/S		ITEM NO. : K-9605A/B	
SERVICE : HOT OIL FURNACE		LOCATION : Fredericia, Denamrk	
1	FAN MANUFACTURER : MP	MODEL / SIZE : MP	ARRANGEMENT : MP
2	SERVICE : Combustion Air: forced draught	*NO. REQUIRED : 2 (Two)	
3	* DRIVE SYSTEM :	FAN ROTATION FROM DRIVEN END : <input type="checkbox"/> CCW <input type="checkbox"/> CW	
4	GAS HANDLED : ambient air	MOLECULAR WEIGHT :	
5	* SITE ELEVATION, m. : 25.25	FAN LOCATION : grade	
OPERATING CONDITIONS			
7	OPERATING CONDITION / CASE : see note	Design	Rated
8	CAPACITY, kg/h.	28287	31116
9	CAPACITY, Am ³ /s.	MP	MP
10	DENSITY, kg/m ³ .	MP	MP
11	TEMPERATURE, °C.	24	30
12	RELATIVE HUMIDITY, %	85	85
13	STATIC PRESSURE @ INLET, Pa.	MP	MP
14	STATIC PRESSURE @ OUTLET, Pa.	MP	MP
15	PERFORMANCE :		
16	KW @ TEMPERATURE (ALL LOSSES INCLUDED)	MP	MP
17	FAN SPEED, RPM.	MP	MP
18	STATIC PRESSURE RISE ACROSS FAN, Pa.	MP	MP
19	INLET DAMPER / VANE POSITION		
20	DISCHARGE DAMPER POSITION		
21	FAN STATIC EFFICIENCY, %.	MP	MP
22	STEAM RATE, kg/kWh. (TURBINE ONLY)		
23	FAN CONTROL :	DRIVER :	
24	* AIR SUPPLY:	MAKE	TYPE MP
25	FAN CONTROL FURNISHED BY:	RATED kW MP	RPM MP
26	METHOD : NO INLET DAMPER NO OUTLET DAMPER	ELECTRICAL AREA CLASSIFICATION	
27	MP INLET GUIDE VANES MP VARIABLE SPEED	CLASS MP	GROUP MP DIVISION MP
28	STARTING METHOD:	POWER MP	Volts MP Ph MP Hz
CONSTRUCTION FEATURES			
30	HOUSING :	BEARINGS :	
31	MATERIAL MP THICKNESS, mm.	<input type="checkbox"/> HYDRODYNAMIC <input type="checkbox"/> ANTI - FRICTION	
32	SPLIT FOR WHEEL REMOVAL <input type="checkbox"/> YES <input type="checkbox"/> NO	TYPE LUBRICATION	
33	DRAINS, NO. / SIZE	COOLANT REQUIRED m ³ /s WATER @ °C.	
34	ACCESS DOORS, NO. / SIZE	THERMOSTATICALLY CONTROLLED HEATERS <input type="checkbox"/> YES <input type="checkbox"/> NO	
35	BLADES :	TEMPERATURE DETECTORS <input type="checkbox"/> YES <input type="checkbox"/> NO	
36	TYPE MP	VIBRATION DETECTORS <input type="checkbox"/> YES <input type="checkbox"/> NO	
37	NO. THICKNESS, mm.		
38	MATERIAL	SPEED DETECTORS :	
39	HUB :	<input type="checkbox"/> NON - CONTACT PROBE	
40	<input type="checkbox"/> SHRINK FIT <input type="checkbox"/> KEYED	<input type="checkbox"/> SPEED SWITCH	
41	MATERIAL MP	<input type="checkbox"/> OTHER	
42	SHAFT :	COUPLINGS :	
43	MATERIAL MP	TYPE MP	
44	DIAMETER @ BRGS., mm.	MAKE	
45	SHAFT SLEEVES :	MODEL	
46	MATERIAL MP	SERVICE FACTOR	
47	SHAFT SEALS :	MOUNT COUPLING HALVES	
48	TYPE	<input type="checkbox"/> FAN <input type="checkbox"/> DRIVER	
49		SPACER <input type="checkbox"/> YES <input type="checkbox"/> NO LENGTH, mm.	
50	WR², kg-m² :		
51	NOTES: (ALL DATA ON PER UNIT BASIS)		
52	Note Line 2: Two FD fans required for improved availability; one will be duty fan and other will be stand-by fan		
53	both fans shall provide identical air flow rates & fan head.		
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FAN DATA SHEET		SI UNITS	
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CONSTRUCTION FEATURES (Cont'd)

1	MISCELLANEOUS :						REV
2	<input type="checkbox"/>	COMMON BASEPLATE (FAN, DRIVER)	<input type="checkbox"/>	SILENCER (INLET/OUTLET) see note	<input checked="" type="checkbox"/>	INLET (SCREEN/ FILTER) see note	
3	<input type="checkbox"/>	BEARING PEDESTALS / SOLEPLATES	<input type="checkbox"/>	EVASE	<input type="checkbox"/>	HOUSING DRAIN CONNECTION	
4	<input checked="" type="checkbox"/>	PERFORMANCE CURVES	<input type="checkbox"/>	VIBRATION ISOLATION	<input type="checkbox"/>	SPARK RESISTANT COUPLING GUARD	
5	<input type="checkbox"/>	SECTIONAL DRAWING	<input type="checkbox"/>	TYPE	<input type="checkbox"/>	INSULATION CLIPS	
6	<input type="checkbox"/>	OUTLINE DRAWING	<input type="checkbox"/>	SPECIAL COATINGS	<input type="checkbox"/>	INSPECTION ACCESS	
7	<input type="checkbox"/>	INLET BOXES	<input type="checkbox"/>	CONTROL PANEL	<input type="checkbox"/>	HEAT SHIELDS	
8	NOISE ATTENUATION :				WEIGHTS, kg. :		
9	*	MAX. ALLOW. SOUND PRESSURE LEVEL	80	dBa @	1	m.	FAN
10		PREDICTED SOUND PRESSURE LEVEL	MP	dBa @	MP	m.	DRIVER BASE
11		ATTENUATION METHOD					SOUND TRUNK
12							EVASE
13		FURNISHED BY					TOTAL SHIPPING WEIGHT
14	PAINTING :						CONNECTIONS :
15	<input type="checkbox"/>	MANUFACTURERS STANDARD					
16							
17	SHIPMENT :						
18	<input type="checkbox"/>	DOMESTIC	<input type="checkbox"/>	EXPORT	<input type="checkbox"/>	EXPORT BOXING REQ'D.	
19							
20	ERECTION :						* TESTS :
21	<input type="checkbox"/>	ASSEMBLED					<input type="checkbox"/>
22	<input type="checkbox"/>	PARTLY ASSEMBLED					<input type="checkbox"/>
23	<input type="checkbox"/>	OUTDOOR STORAGE OVER 6 MONTHS					<input type="checkbox"/>
24	*	APPLICABLE SPECIFICATIONS :					<input type="checkbox"/>
25							<input type="checkbox"/>
26							<input type="checkbox"/>
27							<input type="checkbox"/>
28							<input type="checkbox"/>
29							<input type="checkbox"/>
30	NOTES:						
31	<input type="checkbox"/>	ITEMS MARKED TO BE INCLUDED IN VENDOR SCOPE OF SUPPLY.					
32							
33		Note line 2: where silencer is used (MP) inlet side location is preferred.					
34		Note line 2: screen shall be applied.					
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FAN DATA SHEET				SI UNITS			
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PURCHASER / OWNER : DONG Oilpipe A/S		ITEM NO. : K-96xx	
SERVICE : HOT OIL FURNACE		LOCATION : Fredericia, Denamrk	
1	FAN MANUFACTURER : MP	MODEL / SIZE : MP	ARRANGEMENT : MP
2	SERVICE : Flue Gas: Induced draught	*NO. REQUIRED : 1 (One)	
3	* DRIVE SYSTEM :	FAN ROTATION FROM DRIVEN END : <input type="checkbox"/> CCW <input type="checkbox"/> CW	
4	GAS HANDLED : flue gas	MOLECULAR WEIGHT :	
5	* SITE ELEVATION, m. : 25.25	FAN LOCATION : grade	
OPERATING CONDITIONS			
7	OPERATING CONDITION / CASE : see note	Design	Rated
8	CAPACITY, kg/h.	29970	32967
9	CAPACITY, Am ³ /s.	MP	MP
10	DENSITY, kg/m ³ .	MP	MP
11	TEMPERATURE, °C.	145	MP
12	RELATIVE HUMIDITY, %	MP	MP
13	STATIC PRESSURE @ INLET, Pa.	MP	MP
14	STATIC PRESSURE @ OUTLET, Pa.	MP	MP
15	PERFORMANCE :		
16	KW @ TEMPERATURE (ALL LOSSES INCLUDED)	MP	MP
17	FAN SPEED, RPM.	MP	MP
18	STATIC PRESSURE RISE ACROSS FAN, Pa.	MP	MP
19	INLET DAMPER / VANE POSITION		
20	DISCHARGE DAMPER POSITION		
21	FAN STATIC EFFICIENCY, %.	MP	MP
22	STEAM RATE, kg/kWh. (TURBINE ONLY)		
23	FAN CONTROL :	DRIVER :	
24	* AIR SUPPLY:	MAKE	TYPE MP
25	FAN CONTROL FURNISHED BY:	RATED kW MP	RPM MP
26	METHOD : NO INLET DAMPER NO OUTLET DAMPER	ELECTRICAL AREA CLASSIFICATION	
27	MP INLET GUIDE VANES MP VARIABLE SPEED	CLASS MP	GROUP MP DIVISION MP
28	STARTING METHOD:	POWER MP	Volts MP Ph MP Hz
CONSTRUCTION FEATURES			
30	HOUSING :	BEARINGS :	
31	MATERIAL MP THICKNESS, mm.	<input type="checkbox"/> HYDRODYNAMIC <input type="checkbox"/> ANTI - FRICTION	
32	SPLIT FOR WHEEL REMOVAL <input type="checkbox"/> YES <input type="checkbox"/> NO	TYPE LUBRICATION	
33	DRAINS, NO. / SIZE	COOLANT REQUIRED m ³ /s WATER @ °C.	
34	ACCESS DOORS, NO. / SIZE	THERMOSTATICALLY CONTROLLED HEATERS <input type="checkbox"/> YES <input type="checkbox"/> NO	
35	BLADES :	TEMPERATURE DETECTORS <input type="checkbox"/> YES <input type="checkbox"/> NO	
36	TYPE MP	VIBRATION DETECTORS <input type="checkbox"/> YES <input type="checkbox"/> NO	
37	NO. THICKNESS, mm.		
38	MATERIAL	SPEED DETECTORS :	
39	HUB :	<input type="checkbox"/> NON - CONTACT PROBE	
40	<input type="checkbox"/> SHRINK FIT <input type="checkbox"/> KEYED	<input type="checkbox"/> SPEED SWITCH	
41	MATERIAL MP	<input type="checkbox"/> OTHER	
42	SHAFT :	COUPLINGS :	
43	MATERIAL MP	TYPE MP	
44	DIAMETER @ BRGS., mm.	MAKE	
45	SHAFT SLEEVES :	MODEL	
46	MATERIAL MP	SERVICE FACTOR	
47	SHAFT SEALS :	MOUNT COUPLING HALVES	
48	TYPE	<input type="checkbox"/> FAN <input type="checkbox"/> DRIVER	
49		SPACER <input type="checkbox"/> YES <input type="checkbox"/> NO LENGTH, mm.	
50	WR², kg-m² :		
51	NOTES: (ALL DATA ON PER UNIT BASIS)		
52			
53			
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58			
FAN DATA SHEET		SI UNITS	
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CONSTRUCTION FEATURES (Cont'd)

1	MISCELLANEOUS :						REV
2	<input type="checkbox"/>	COMMON BASEPLATE (FAN, DRIVER)	<input type="checkbox"/>	SILENCER (INLET/OUTLET) see note	<input checked="" type="checkbox"/>	INLET (SCREEN/ FILTER) see note	
3	<input type="checkbox"/>	BEARING PEDESTALS / SOLEPLATES	<input type="checkbox"/>	EVASE	<input type="checkbox"/>	HOUSING DRAIN CONNECTION	
4	<input checked="" type="checkbox"/>	PERFORMANCE CURVES	<input type="checkbox"/>	VIBRATION ISOLATION	<input type="checkbox"/>	SPARK RESISTANT COUPLING GUARD	
5	<input type="checkbox"/>	SECTIONAL DRAWING	<input type="checkbox"/>	TYPE	<input type="checkbox"/>	INSULATION CLIPS	
6	<input type="checkbox"/>	OUTLINE DRAWING	<input type="checkbox"/>	SPECIAL COATINGS	<input type="checkbox"/>	INSPECTION ACCESS	
7	<input type="checkbox"/>	INLET BOXES	<input type="checkbox"/>	CONTROL PANEL	<input type="checkbox"/>	HEAT SHIELDS	
8	NOISE ATTENUATION :				WEIGHTS, kg. :		
9	*	MAX. ALLOW. SOUND PRESSURE LEVEL	80	dBa @ 1 m.	FAN		
10		PREDICTED SOUND PRESSURE LEVEL	MP	dBa @ MP m.	DRIVER		BASE
11		ATTENUATION METHOD				SOUND TRUNK	
12						EVASE	
13		FURNISHED BY				TOTAL SHIPPING WEIGHT	
14	PAINTING :				CONNECTIONS :		
15	<input type="checkbox"/>	MANUFACTURERS STANDARD			SIZE	RATING	ORIENTATION
16							
17	SHIPMENT :						
18	<input type="checkbox"/>	DOMESTIC	<input type="checkbox"/>	EXPORT	<input type="checkbox"/>	EXPORT BOXING REQ'D.	
19							
20	ERECTION :				* TESTS :		
21	<input type="checkbox"/>	ASSEMBLED			<input type="checkbox"/>	MECHANICAL RUN IN. (NO. LOAD)	
22	<input type="checkbox"/>	PARTLY ASSEMBLED			<input type="checkbox"/>	WITNESSED PERFORMANCE	
23	<input type="checkbox"/>	OUTDOOR STORAGE OVER 6 MONTHS			<input type="checkbox"/>	ROTOR BALANCE	
24	* APPLICABLE SPECIFICATIONS :				<input type="checkbox"/>	SHOP INSPECTION	
25					<input type="checkbox"/>	ASSEMBLY AND FIT - UP CHECK	
26					<input type="checkbox"/>	LATERAL CRITICAL SPEED	
27					<input type="checkbox"/>	TORSIONAL CRITICAL SPEED	
28					<input type="checkbox"/>		
29					<input type="checkbox"/>		
30	NOTES:						
31	<input type="checkbox"/>	ITEMS MARKED TO BE INCLUDED IN VENDOR SCOPE OF SUPPLY.					
32							
33	Note line 2: where silencer is used (MP) inlet side location is preferred.						
34	Note line 2: screen shall be applied.						
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FAN DATA SHEET				SI UNITS			
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LHT Hot Oil Heat Transfer Furnace F9601		GAS FUEL CHARACTERISTICS		www.AllSurplus.com/asset/6/27040			
1	* FUEL TYPE	SEE NOTE	LP Fuel gas (base case)	LP Fuel gas (Startup)	HP Fuel		
2	* HEATING VALUE (LHV) , (kJ/kg		45070	48250	44990		
3	* SPECIFIC GRAVITY (AIR = 1.0)						
4	* MOLECULAR WEIGHT		38.87	26.1	35.79		
5	* FUEL TEMPERATURE @ BURNER, °C.		MP	MP	MP		
6	* FUEL PRESSURE; AVAILABLE @ BURNER, barg.		MP	MP	MP		
7	* FUEL GAS COMPOSITION	SEE NOTE					
8	FUEL PRESSURE; AVAILABLE @ BL, barg.	SEE NOTE	5.2	4.5	21.2		
9							
10							
11							
12							
13							
14							
15							
16							
17	LIQUID FUEL CHARACTERISTICS						
18	* FUEL TYPE						
19	* HEATING VALUE (LHV) , kJ/kg.						
20	* SPECIFIC GRAVITY / DEGREE API						
21	* H / C RATIO (BY WEIGHT)						
22	* VISCOSITY, @ MP °C. (SSU)						
23	@ MP °C. (SSU)						
24	* VANADIUM, ppm.						
25	* SODIUM, ppm.						
26	* POTASSIUM, ppm.						
27	* NICKEL, ppm.						
28	* FIXED NITROGEN, ppm.						
29	* SULFUR, % wt.						
30	* ASH, % wt.						
31	* LIQUIDS: ASTM INITIAL BOILING POINT, °C.						
32	ASTM END POINT, °C.						
33	* FUEL TEMPERATURE @ BURNER, °C.						
34	* FUEL PRESSURE AVAILABLE @ BURNER, kPa.g.						
35	* ATOMIZING MEDIUM: AIR / STEAM / MECHANICAL						
36	TEMPERATURE, °C.						
37	PRESSURE, kPa.g.						
38	MISCELLANEOUS						
39	BURNER PLENUM: COMMON / INTEGRAL		Individual windbox				
40	MATERIAL		MP				
41	PLATE THICKNESS, mm.		MP				
42	INTERNAL INSULATION		MP				
43	INLET AIR CONTROL: DAMPER OR REGISTERS		damper				
44	MODE OF OPERATION		Manual				
45	LEAKAGE, %.		MP				
46	BURNER TILE: COMPOSITION		MP				
47	MINIMUM SERVICE TEMPERATURE, °C.		MP				
48	NOISE SPECIFICATION		80 dB(A) at 1m (see note sheet 10)				
49	ATTENUATION METHOD		MP				
50	PAINTING REQUIREMENTS		MP				
51	IGNITION PORT: SIZE / NO.		MP				
52	SIGHT PORT: SIZE / NO.		50 mm for sight port				
53	* FLAME DETECTION: TYPE		MP				
54	NUMBER / LOCATION		1				
55	CONNECTION SIZE		Swivel joint				
56	SAFETY INTERLOCK SYSTEM FOR ATOMIZING MEDIUM & OIL		-				
57	* PERFORMANCE TEST REQUIRED (YES or NO)						
58	NOTES:						
59	Line 1, 7 : See Sheet 10						
60							
BURNER DATA SHEET API STANDARD 560 BuyerHelp@AllSurplus.com		SI UNITS					
		DATE	MADE BY	CHECK.	APPR.	SHEET	REV
		04/02/2011	EK	EK	LG	9 OF 15	1