DEGUSSA-HÜLS ENGINEERING DEPARTMENT EQUIPMENT NUMBER QUANTITY PREPARED BY APPROVED BY APPROVED BY DATE: 8/10/00 T-3910 T. Adcock / S. Irby SHEET OF 02 PLANT AREA OR UNIT RFQ NUMBER P.O. NUMBER PROJECT NUMBER 39 - Distillation Phenolchemie 4077-0003 4078-00001 SERVICE ACCOUNT NUMBER P&ID NUMBER CAR NUMBER Distillation Column C-39-B-005-00 PROCESS DATA ACCESSORIES 05 ORIENTATION: VERTICAL X HORIZONTAL **OTHER** ITEM DESCRIPTION 06 VESSEL **JACKET** COII AGITATOR Ν WORKING VOLUME | Gai 07 4000 N/A N/A EXTERNAL JACKET N TOTAL VOLUME 08 Gal 4079 N/A N/A INTERNAL COILS N 09 FLUID PC-Oil / Cumene INTERNAL BAFFLES N/A N/A N 10 FLUID STATE IN Liquid N/A N/A METHOD OF SUPPORT Y Skirt 11 FLUID STATE OUT Vapor / Liquid N/A N/A GASKETS Ÿ Spiral Wound two(2) sets of spares 12 OPERATING T IN 110 N/A N/A INSULATION RINGS Υ Per Spec. 17529 13 OPERATING T OUT 125 / 215 N/A N/A LIFTING LUGS Y Tailing Lug also. Per 17529 14 DENSITY IN #/CF 53.5 N/A N/A FIRE PROTECTION CLIPS Y On skirt inside and outside 15 DENSITY OUT #/CF 0.11 / 54 N/A N/A GROUND LUGS Per Spec. 17529 16 OPERATING P Psia 7.25 N/A N/A OTHER ladder rungs, guides [4] DESIGN & CONSTRUCTION DATA 17 NOZZLE DATA 18. DIMENSIONS DIAMETER 3'-6"OD T to T LENGTH: 52'-8' TYPE & 19 HEAD TYPE TOP 2:1 ellipt. BOTTOM: 2:1 ellipt. MARK SIZE SERVICE **FACING** 20 VESSEL JACKET COIL 21 DESIGN P Psig 50 / FV N/A A1 4" Feed Inlet 150# RFSO 22 DESIGN T 250 N/A N/A A2. A3 4" Feed Inlet (alternate) 150# RFSO 23 HYDROSTATIC TEST P 65 N/A N/A A4 16" Vapor from Reboiler 150# RFSO 24 MATERIALS OF CORROSION A5 4" Reflux inle 150# RFSO 25 CONSTRUCTION THICKNESS ALLOWANCE B1 12' Top Vapor Out 150# RFSO 26 SHELL 316L SS N/A B2 3" Bottom Product 150# RFSO 27 HEADS 316L SS 0.25 N/A **B**3 6" Liquid to Reboiler 150# RFSO 28 JACKET N/A 2" N/A N/A P1 - P5 Pressure Instruments 150# RFSO 29 COIL N/A N/A N/A T1 - T7 Temperature Instruments 150# RFSO 30 BAFFLES N/A N/A N/A L1. L2 31 Level Instrument 150# RFSO 31 NOZZLES 316L SS Std. Wall N/A M1 24 Manway 150# RFSO 32 FLANGES 316L SS 150# N/A M2. M3 20' Manway 150# RFSO BOLTING SA 193 B7 w/ 194 2H N/A G1, G2 4" Sight Glass 150# RFSO 3 34 GASKETS Spiral Wound 0.125 N/A 3" E1 Spare (blind) 150# RFSO 35 SUPPORTS 0.375N/A F2 3" Spare (blind) 150# RFSO 3 36 INSULATION TYPE Mineral Wool THICKNESS: 37 INTERNAL FINISH Per Spec. 17529 S1, S2 18 Skirt Access Inorganic Zinc Primer to skirt and CS supports 38 PAINTING V1-V4 3" Skirt Vents 3 39 REMARKS Y/N 40 CYCLIC SERVICE 41 CODE CONSTRUCTION Y ASME Sec. IIIV, Div. I 42 STRESS RELIEF N RADIOGRAPHIC EXAMINATION Ÿ CODE INSPECTION REQUIRED CUSTOMER INSPECTION REQUIRED Ÿ 46 WIND LOAD 120 mph Ÿ EARTHQUAKE AREA Y Zone 0 REQUIRED JOINT EFFICIENCY 48 85%, 100% Heads 3 49 WEIGHT - EMPTY 14000 lbs 3 WEIGHT - OPERATING 45000 lbs 51 WEIGHT - FULL OF WATER 45000 lbs 52 OTHER REQUIREMENTS NOTES 53 (A) If specified above, construction shall be in accordance with the latest ASME code See the following Degussa-Huls specifications for additional requirements: 54 Section VIII, Division I, Part UW 17100 General Requirements for Equipment (B) Locate all welding seams to clear nozzles and saddles 17529 Pressure Vessels-General Requirements (C) All bolt holes shall straddle centerlines unless otherwise noted 17557 Painting of Equipment 57 (D) All nozzles shall project 6" from outside surface of equipment to face of flange. SP-9.1.1 Welding Pressure Vessels unless otherwise noted, and shall be mounted true to centerline. When Tray support ring details to be provided by tray vendor. Quote a 2" x3/8" flat 59 insulation is specified herein, nozzle projections must be reviewed. bar tray support ring rolled the hard way and seal welded to the shell. 60 (E) Vendor shall furnish bolts, nuts and gaskets where mating flanges are supplied Tray support ring shall be of the same material as shell. (F) All welding shall be full, continuous, free from slag porosity and other defects. Skirt height to be 16 ft-3in. Supply four skirt vents and two access (G) All flanges shall not be warped, but shall be true, and gasket smooth after openings in skirt. Vendor shall provide ladder rungs inside column bottom and four shoe 64 (H) All heads preferred hot formed; if cold formed, they must be inspected and dye type guides at elevation 50'-6" and 70'-6". checked. Stainless steel heads must be fully solution annealed, water quenched Vendor shall provide one(1) 360 degree platform and ladder. and pickled after forming. Vendor shall provide achor bolt pattern template. * DATA MARKED BY AN ASTERISK MUST BE FURNISHED BY VENDOR UNLESS SPECIFIED BY PURCHASER WITH QUOTE. 67 REVISION: REVISION: REVISION: REVISION: REVISION: REVISION: DATE: 8/10/00 DATE: 9/5/00 DATE: 9/12/00 DATE: 10/10/00 DATE: 10/31/00 DATE: VES01R03

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DEGUSSA-HÜLS ENGINEERING DEPARTMENT

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	EQUIPMENT NUMBER QUANTITY PREPARED BY		APPROVED BY		APPROVED BY		DATE: 8/10/00 SHEET 2 OF 2		П
	-3910 one S. Irby LANT AREA OR UNIT		RFO NUMBER		P.O. NUMBER		PROJECT NUMBER		H
	Phenolchemie 39-Distillation SERVICE					40770002			
			ACCOUNT N	ACCOUNT NUMBER		P&ID NUMBER		CAR NUMBER	
\vdash	Distillation Column	C C C C C C C C C C C C C C C C C C C		C-39-B-005-00) 			-	
04	COLID DI SECOMONI	OCESS DATA	CESS DATA					Н	
	COLUMN SECTION TRAYS PER COLUMN SECTION	24 *						H	
	TRAY NUMBER (Top to Bottom)	1 to 24 *						H	
	TRAY DESCRIPTION	Valve Trays							
	FLUID DESCRIPTION	PC-Oil						0	
	FOAMING TENDENCY	No		MANDEDA	MINIMUM	MANDADA	MINIMATINA	0	
11 12	VAPOR TO TRAY FLOWRATE	РРН	MAXIMUM 15000	MINIMUM 6000 [44]	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	Н
13	TEMPERATURE	C	214	126					H
14	PRESSURE	Psia	9	7.2					
15	DENSITY	#/CF	0.126	0.11				<u> </u>	Н
16	VISCOSITY	Cps	0.011	0.008					$oldsymbol{H}$
17 18			<u> </u>						Н
19									
20	LIQUID FROM TRAY			MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	MINIMUM	\Box
21	FLOWRATE	PPH	20000	1500			ļ		₩
22	TEMPERATURE DENSITY	C #/CF	214 54.20	126 48.1	-				1-1
24	VISCOSITY	Cps	0.65	0.27			<u> </u>		Н
25	SURFACE TENSION	Dynes/Cm	22.9	17.6					\Box
26									$oldsymbol{\sqcup}$
27 28		-	 						+
29	LIMITING VALUES		@ MAX Flow	@ MIN Flow	@ MAX Flow	@ MIN Flow	@ MAX Flow	@ MIN Flow	#
30	MAXIMUM DELTA P PER TRAY [41]	mm Hg	4						口
31	MAXIMUM DELTA P PER SECTION [41]	mm Hg	96						\Box
32	SYSTEM FACTOR			.0					0
33	MAXIMUM FLOODING FACTOR [41]	%		70			1		H
35								\Box	
36		HANICAL DA	ANICAL DATA						
37	TRAY TYPE [42]		lexitrays					0	
38	COLUMN SECTION INSIDE DIAMETER TRAY SPACING	Feet Inches		20	<u> </u>				╂╌┨
39 40	DOWNCOMER RESIDENCE TIME	Seconds		TBD					0
41	NUMBER OF DOWNCOMERS [42]		1 per tray						\Box
42	LIQUID HEIGHT IN DOWNCOMER [42]	Inches	16.92 250				<u> </u>		0
43 44	DESIGN TEMPERATURE VALVE TYPE	С		Koch "T0"			 		0
45	VALVETTIE	MATERIALS OF C					<u> </u>		+
46	TRAY DECK	316L SS							
47	DOWNCOMER	316L SS						┦┤	
48	TRAY SUPPORTS BUBBLE CAPS	316L SS N/A		 				╂┤	
49 50	VALVES		L SS	 					
51	BOLTING		L SS						
52			Nome					+	
53	NOTES	 	NOTES						
54	 To be guaranteed by tray vendor Design of the internals must be specified or confirmed by 							H	
	43. Trays must be designed for fouling conditions.								
	44 See attached hydraulic profile.							0	
	45 Vendor shall provide a hydraulic guarantee of the trays.	1							
59 60	 Vendor shall supply bottom tray downcomer seal pans. Vendor shall supply 5% extra installation hardware. 								
61	To remot shall supply 5 % colla assaulton halowate.								
62									
63									
64									
65 66		 							
67	* DATA MARKED BY AN ASTERISK MUST BE FURNISHED BY VENDOR UNLESS SPECIFIED BY PURCHASER WITH QUOTE.								1
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