TOYO-THAI CORPORATION PUBLIC COMPANY LIMITED

MECHANICAL DATA SHEET

DOCUMENT NO. F032-21E401AB-MDS-001

Service of Unit : Graphite Heat Exchanger — Item No.21-E401A/B

Size Tube: 1850 OD x 7200L mm — Type : Vert. — Connected In 1 Parallel 1 Series

Exchange Area (1) : Required 785.5 m^2 — Actual 824.5 m^2

PERFORMANCE OF ONE UNIT

		Shell Side		Tube Side	
Fluid Allocation		Low Pressure Steam / Condensate		Concentrated phosphoric acid (2)	
Fluid Name		28,740 (3)		14,045,353	
Fluid Quantity, Total	kg/hr	28,740 (3)	----	----	----
Vapor (In/Out)	kg/hr	----	28,740	14,045,353	14,045,353
Liquid	kg/hr	----	----	----	----
Steam	kg/hr	----	----	----	----
Water	kg/hr	0	----	0	----
Noncondensables	kg/hr	111 - 131 (4)	111 - 131 (4)	86	88.1
Temperature (In/Out)	°C	1.5	940	1762	1762
Density	kg/m^3	0.259	0.262	35.0	32.9
Viscosity	CP	18.01	----	----	----
Molecular Weight, Vapor	g/mol	----	----	----	----
Molecular Weight, Noncondensables		1.0036	1.0034	0.5181	0.5181
Specific Heat	kcal/(kg*°C)	0.588	0.588	0.4	0.4
Thermal Conductivity	kcal/(hr*m*°C)	530.42	----	----	----
Latent Heat	kcal/kg	49-179 (4)		99	
Inlet Pressure	kPa	28.6		2.65	
Velocity (cal / allow)	m/s	6.08 / 10		51.88 / 60	
Pressure Drop, Cal / Allow	kPa	0.0002		0 (5)	
Fouling Coeffcienсy	m^2 °C/W				

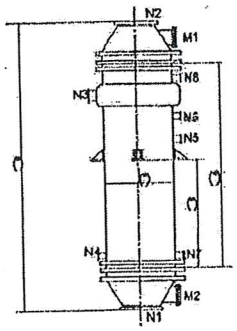
Heat Exchanged : 15,280 kW — L.M.T.D (CORRECTED) : Clean 24 °C , Fouled 44 °C

Transfer Rate : Service 799.9 kcal/m^2 °C hr , Clean 839.6 kcal/m^2 °C hr , Dirty 839.6 kcal/m^2 °C hr

CONSTRUCTION OF ONE SHELL

		No.	Shell Side	Tube Side
Design/Test Pressure	kPaG		600 / FV	400 / FV
Design Temperature	°C		180	91
No Passes per Shell			1	1
Corrosion Allowance	mm		2	0
Connections	In	1	N3 28" #150 RF (8)	N1 56" #150 FF
Size ,Rating	Out	1	N4 8" #150 RF (9)	N2 56" #150 FF
and Facing	PI	1	N5 1" #150 RF	----
	Vent	1	N8 1" #150 RF	
	Shell Vent	1	N9 1/2" #150 RF	
	Spare	1	N7 2" #150 RF	----
	Relief Valve Conn.	1	N6 1 1/2" #150 RF	----
	Drain	2	N10 1/2" #150 RF	N11 1/2" #150 RF
	Manhole	2	----	M1,M2 24" #150 FF

Sketch (Bundle/Nozzle Orientation)



Tube No. : 733 OD. : 51 mm — Thk : 6.5 mm — Length : 7200 mm. — Pitch : 57.8 mm. — Layout : Triangular

Tube Type : Plain / Joint — Material : Graphilor3 XBS

Shell Mat'l : A516 Gr.70 / SS316L (6) — ID : 1822 mm. — OD : 1850 mm.

Channel or Bonnet Mat'l : A516 Gr.70 + Rubber Lining (7) — Type : removable

Tubesheet Mat'l : Graphilor 3 BS — Type : floating at bottom/stationary at top

Floating Head Cover : ---- — Impingement Plate : — Mat'l : ---- ----

Baffles-Cross Mat'l : Graphilor 3 — Type : Single Segment — %Cut (Diam) 45 — Spacing(c/c) : 679 mm — Inlet : 1768 mm

Supports-Tube Mat'l : ---- — U-Bend : ---- — Type : ----

Tie Rods Mat'l : A193 Gr.B7 — No. : 12 — Diameter : 32 mm

Bypass Seal Arrangement : - — Tube-Tubesheet Joint : Cemented

Expansion Joint : Sliding gasket

Rho-V2-Inlet Nozzle ---- kg/m-S2 — Bundle Entrance ---- $kg/m\text{-}s^2$ — Bundle Exit ---- $kg/m\text{-}s^2$

Gaskets Shell Side : PTFE — Tube Side : PTFE

Code Requirements ASME Sec. VIII Div.1 Lasted Edition — TEMA Class R

Weight/Shell 29000 kg — Filled with Water 50000 kg — Bundle - kg

Remarks:

(1) Total heat exchanger surface was consideration 5% spare.

(2) Contains P2O5 : 52 %. SO3 : 4.5 %. F : 0.8-1.1 %. Solids 6 % to 8 % (size 5-500 µm)

(3) Maximum steam flow : 32300 kg/hr, Steam flow rates was consideration .

(4) Temperature & pressure of steam feed increased in relation with fouling built-up between washing cycles.

(5) Cleaning with acidic hot water after 4 days operating (estimated 0.0006 m^2 °C/W) - 2 washes per week.

(6) Stainless steel (SS 316L) for 1 m length at lower shell end.

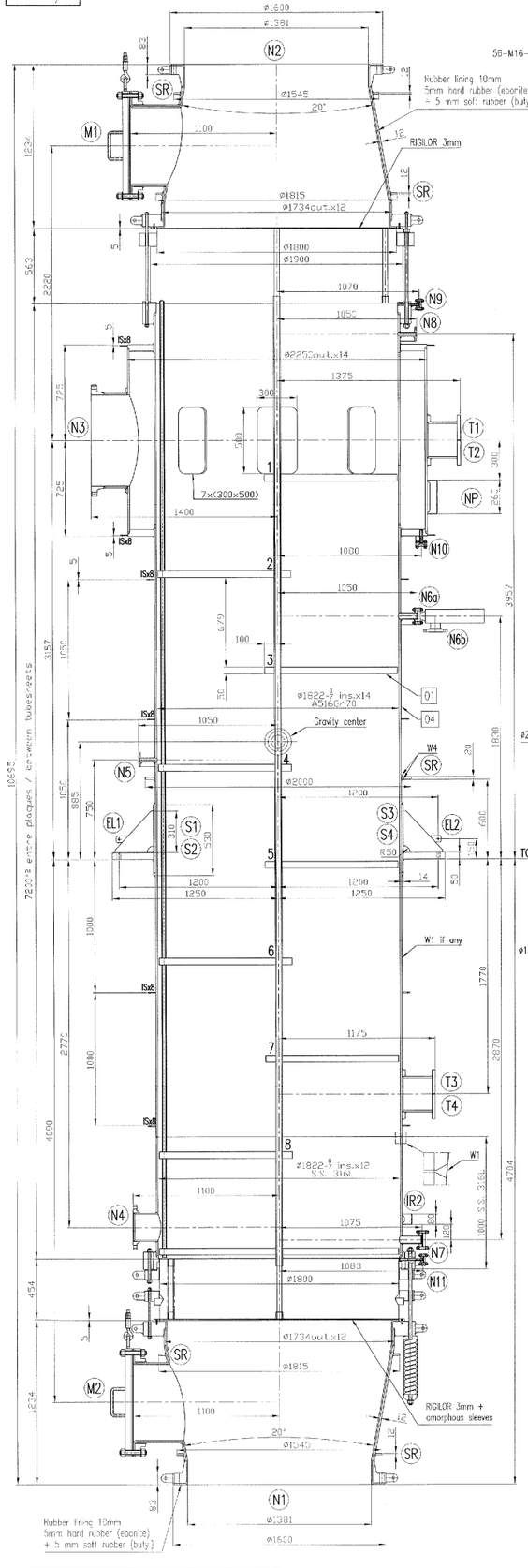
(7) CS with two laters of rubber lining ; 5mm hard (ebonite) and 5 mm soft (butyl).

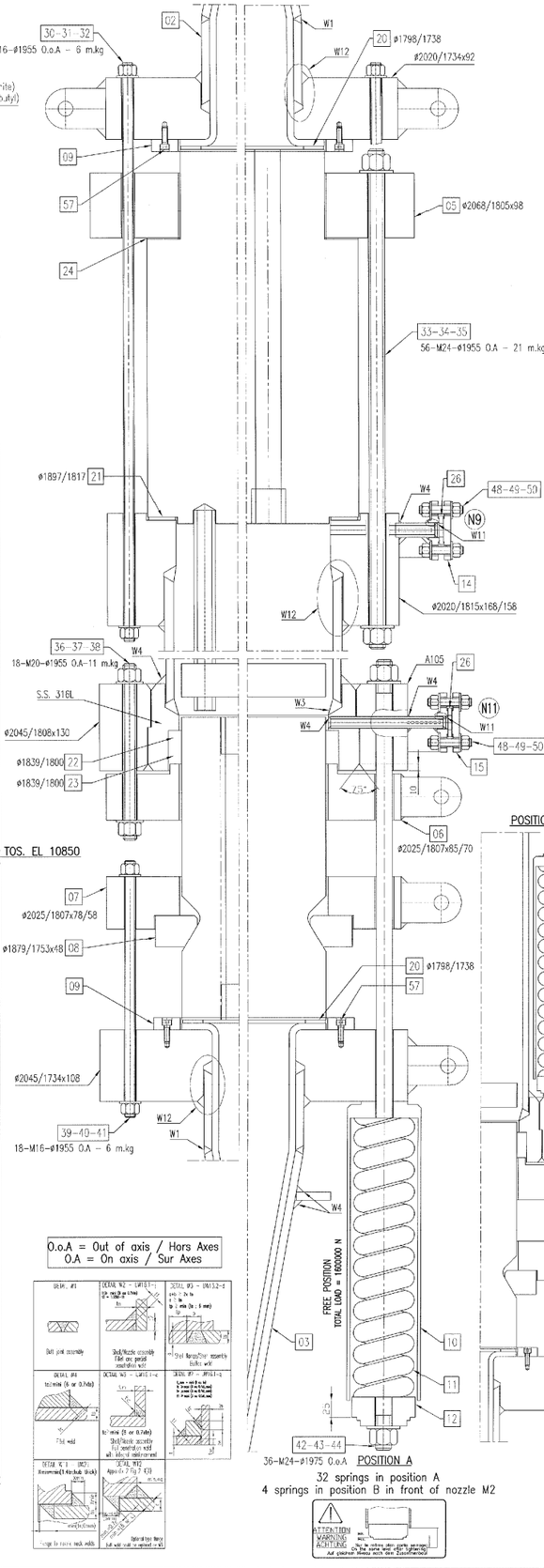
(8) Steam inlet have filled with a distribution chamber designd to prevent any direct impact of steam and droppletes on the tubes.

(9) Position and size of nozzle N4 have allowed to complete draining of condensate from shell bottom during operation.

TITLE	PLANT	TTCL Job No.	ITEM No.	SHEET No.	REV
GRAPHITE HEAT EXCHANGER	DAP No.2-VINACHEM PROJECT	F-032	21-E401A/B	1 OF 1	2

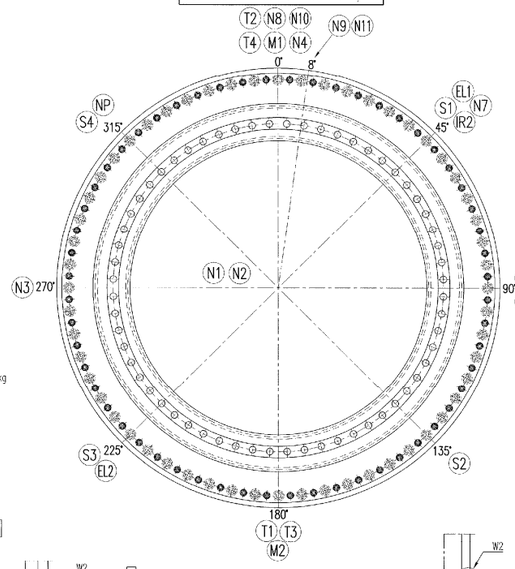
SCALE 1/15

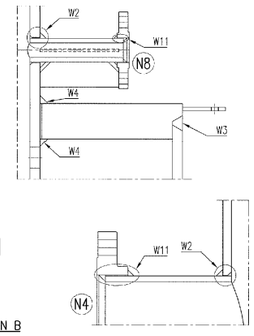


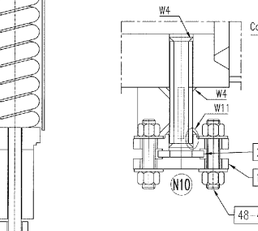


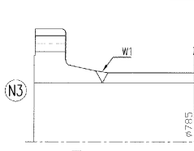
O.o.A = Out of axis / Hors Axes
O.A = On axis / Sur Axes

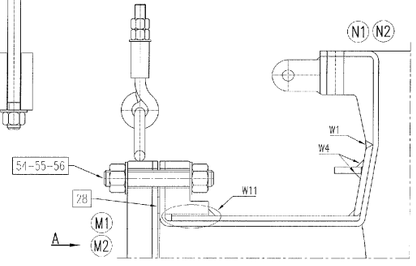
TOP VIEW - ORIENTATION : 1/10

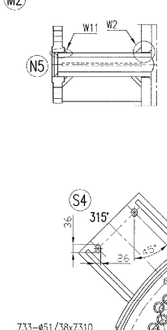




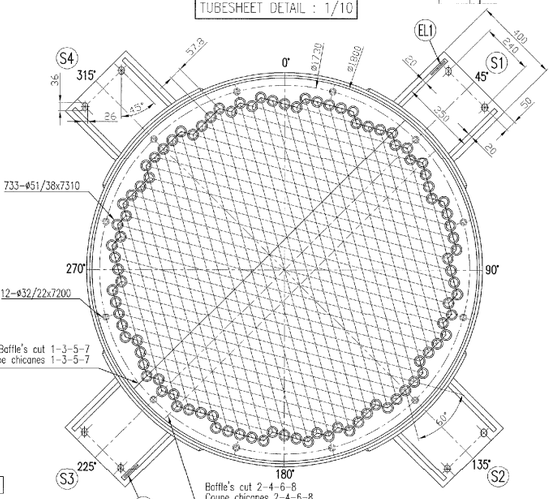




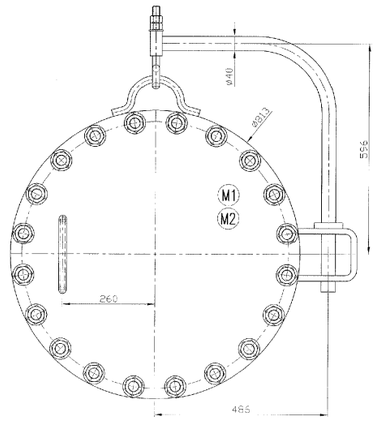


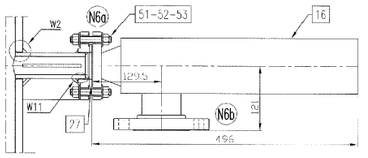


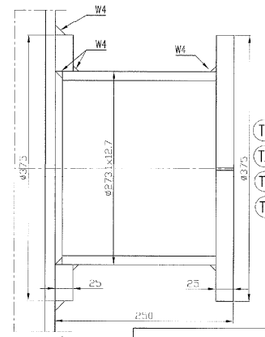
TUBESHEET DETAIL : 1/10

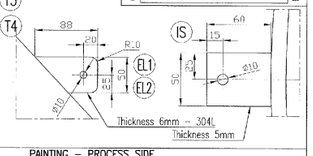


VIEW ALONG A : 1/6









RACCORDEMENT - CONNECTION

ITEM	SIZE	PIPE OD	PIPE Sch./Thk.	FLANGE Type	FLANGE Face	STD	DRILLING	SERVICE	REMARK	TORQUE (mkg)	F x,y,z (N)	M x,y,z (Nm)
N1	56"	1425	12	WN	FF	ANSI 150	60-ø31.8-ø1543.1	ACID INLET	ASME B16.47 SERIES B	7	14000	7000
N2	56"	1425	12	WN	RF	ANSI 150	60-ø31.8-ø1543.1	ACID OUTLET	ASME B16.47 SERIES B	7	14000	7000
N3	28"	711	14	WN	RF	ANSI 150	40-ø22.4-ø795.3	STEAM INLET	ASME B16.47 SERIES B	7	7000	3500
N4	8"	219.1	8.18	SO	RF	ANSI 150	8-ø22.2-ø298.4	CONDENSATE OUTLET	-	5	2000	1000
N5	1"	33.4	6.35	SO	RF	ANSI 150	4-ø15.8-ø79.4	PI	-	3	62.5	31.25
N6a	1"1/2	48.3	7.14	SO	RF	ANSI 150	4-ø15.9-ø98.4	RELIEF VALVE CONNECTION	-	3	100	50
N6b	2" 1/2	-	-	SO	RF	ANSI 150	4-ø19-ø139.7	RELIEF VALVE	-	7	-	-
N7	2"	60.3	3.91	SO	RF	ANSI 150	4-ø19-ø120.6	SPARE	WITH BLIND FLANGE	4	-	-
N8	1"	33.4	6.35	SO	RF	ANSI 150	4-ø15.8-ø79.4	VENT	-	3	62.5	31.25
N9	1/2"	21.3	3.73	SO	RF	ANSI 150	4-ø15.9-ø60.3	SHELL VENT	WITH BLIND FLANGE	4	-	-
N10	1/2"	21.3	3.73	SO	RF	ANSI 150	4-ø15.9-ø60.3	STEAM CHAMBER DRAIN	WITH BLIND FLANGE	4	-	-
N11	1/2"	17.2	3.2	SO	RF	ANSI 150	4-ø15.9-ø60.3	SHELL DRAIN	WITH BLIND FLANGE	4	-	-
M1/M2	24"	609.4	9.52	SO	FF	ANSI 150	20-ø35.1-ø749.3	MAN HOLE	WITH BLIND FLANGE	6	-	-

AUTRES - OTHERS

NP	MERSEN'S NAME PLATE	-
IR2	IMPACT RECORDER	-
T1 to T4	LIFTING TRUNNIONS	-
S1 to S4	SUPPORTS	-
IS	INSULATION SUPPORTS	-
EL1-EL2	EARTHING LUG	-
SR	STIFFENER RING	-

61

60

MERSEN

1 Rue Jules Ferry, BP N°1
69530 - FAGNY SUR ORGNON CEDEX - FRANCE

DWG | CAT

TYPE 70" V01 PYTIC 6 24" 51/38 4 733

CODE VIII Div1 Ed. 2010 - Add. 2011 - none

PROJECT 2013 | REF. MERSEN 215565 | N°

Tube 600269 / 600270 GRAPHILOR BS

WORK. PRESS. 29000 kg | SURFACE EXCH. Net/Tot. Area 824.5 m2

N° OF DR. GUIDE FD32-S11000-P0000003

21-E401A for 600269
21-E401B for 600270

	PROCESS	SERVICE
DESIGN PRESSURE (Bar)	FV/200	8820
DESIGN TEMPERATURE (°C)	+0.1/0.4	+0.1/0.8
CORROSION ALLOWANCE (mm)	0.6	0.78
JOINT EFFICIENCY	-	-
WEIGHT (kg)	0.791	0.7180
	P250	STEAM

*Mpag

PAINTING - PROCESS SIDE

-1- coat of EPOXYDIC PRIMER 2 COMPONENTS WITH ZINC PHOSPHATE thickness of dry film : 50µ from 35510
-1- coat of EPOXYDIC PRIMER 2 COMPONENTS WITH ZINC PHOSPHATE thickness of dry film : 50µ from 35510
-1- coat of ACRYLIC URETHANE FINISHING LAQUE 2 COMPONENTS RAL 7032 BRILIANT thickness of dry film : 50µ
- MINIMUM TOTAL THICKNESS OF DRY FILM : 150 MICRONS -

PAINTING - SERVICE SIDE

PICKING AND PASSIVATION FOR STAINLESS STEEL PARTS
-1- coat of EPOXYDIC PRIMER 2 COMPONENTS WITH ZINC PHOSPHATE thickness of dry film : 60µ from 35510
-1- coat of EPOXYDIC PRIMER 2 COMPONENTS WITH ZINC PHOSPHATE thickness of dry film : 40µ from 35510
-1- coat of ACRYLIC URETHANE FINISHING LAQUE 2 COMPONENTS RAL 7032 BRILIANT thickness of dry film : 40µ
- MINIMUM TOTAL THICKNESS OF DRY FILM : 140 MICRONS -

1) CODE: DESIGNED AND FABRICATED ACCORDING TO ASME VIII Div1 Ed. 2010 - Add. 2011 - none
2) PART LIST : 0.21941N
3) WELDING BOOK : ASME IX LAST EDITION
4) MECHANICAL DESIGN : 0.21941C
5) ALL NOZZLE FLANGE BOLT HOLES TO STRADDLE CENTERLINES.
6) ESTIMATED WEIGHTS: EMPTY = 29000 kg / LIFTING = 35250 kg / OPERATING = 50000 kg / TESTING = 50000 kg
7) CORROSION : PROCESS SIDE 0 MM ; SERVICE SIDE : CARBON STEEL 2 MM, STAINLESS STEEL 0 MM, LIFTING TRUNNIONS 2.25 MM
8) POST WELDING HEAT TREATMENT : NO
9) MERSEN RESERVES THE RIGHT TO REPLACE MATERIALS COMPLYING WITH REGULATION OF THE PRESENT ORDER WITH MATERIALS HAVING MECHANICAL PROPERTIES AT LEAST EQUIVALENT.

GENERAL ALLOWANCES acc. to CHAPTER F1.5 Codap 2010 Div2 Part F

REV	DATE	OBJET DE LA REVISION - DESCRIPTION OF THE REVISION	PART VERIFIED BY	CHECKED
08	02/12/13	Cancelled IR1	LOS	CHD
07	11/06/13	Updating painting and elevation TOS	LOS	CFR
06	03/06/13	Changed slot holes orientation on supports	LOS	CHD
05	29/04/13	Added gravity center	LOS	CHD
04	16/04/13	Changed size of nozzle N6b (DN2"-->DN2"1/2)	LOS	CHD
03	03/04/13	Changed welding on nozzle N3	LOS	CFR
02	11/03/13	Added 2.25mm corrosion on lifting trunnions, FF flange for rubber lining	LOS	CFR
01	26/02/13	Updated after customer's requests dated 22-02-13	LOS	CHD
00	04/02/13	VERSION D'ORIGINE - ORIGINAL DRAWING	LOS	CHD

CLIENT - CUSTOMER TOYO THAI
No DE COMMANDE-ORDER Nb F032-TTCL/MERSEN-LI-001

N° D'AFFAIRE MERSEN JOB Nb
N° DE DOMMANDE MERSEN ORDER Nb AFF 215565
D'APRES PLAN-ACCORDING TO
PLAN D'ENSEMBLE-ASSEMBLY DRAWING

POLYTUBE HEAT EXCHANGER Items 21-E401A/B
70" V01 PYTIC 6 20' 51/38 4 733

Echelle-Scale 1/

PLAN No-DRAWING Nb 0.21941

REV. | 00 | 01 | 02 | 03 | 04
08 | 07 | 06 | 05

MERSEN

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08	Cancelled IR1	LOS	CHD							02/12/13
07	updating painting and elevation TOS	LOS	CFR							11/06/13
06	Changed slot holes orientation on supports	LOS	CHD	ORIGINAL SIGNED						03/06/13
05	Added gravity center	LOS	CHD	ORIGINAL SIGNED						30/01/13
04	Changed size of nozzle N6b (3"NO" - >DN2"1/2)	LOS	CHD	ORIGINAL SIGNED						12/04/13
03	Changed welding on nozzle N3	LOS	CFR	ORIGINAL SIGNED						03/04/13
02	Updated after customer's requests dated 22-02-13	LOS	CFR	ORIGINAL SIGNED						11/03/13
01	Updated after customer's requests dated 22-02-13	LOS	CHD	ORIGINAL SIGNED						26/02/13
00	ORIGINAL DRAWING	LOS	CHD	ORIGINAL SIGNED						04/02/13
REV.	DESCRIPTION	ENGR.	CHK'D	A/L	CHIEF	MGR	APPR.	ISSUE		DATE MM/DD/YY

DAP NO.2 - VINACHEM PROJECT

DAP NO.2 VINACHEM JSC

TTCL CECO VINACHEM

ADDR. FOR ISSUE
C=CUSTOMER
L=CONSEIL
F=FIELD
V=VENDOR

บริษัท โตโย-ไทย คอร์ปอเรชั่น จำกัด (มหาชน)
TOYO-THAI CORPORATION PUBLIC COMPANY LIMITED

FOR JOB No. F 032 | ACCOUNT | CUSTOMER'S ORDER No

ISSUE MARK

POLYTUBE HEAT EXCHANGER Items 21-E401A/B
70" V01 PYTIC 6 20' 51/38 4 733

SCALE | DWG. No. 21E401-11-001

								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
								F L V	/ /
02	Changed quantity Item 61	LOS	CHD					F L V	02/12/13
01	Updated after customer's requests dated 22-02-13	LOS	CHD					F L V	26/02/13
00	ORIGINAL DRAWING	LOS	CHD					F L V	04/02/13
REV.	DESCRIPTION	DWN.	CHK'D	A/E	CHIEF	MGR	APPR	ISSUE	DATE MM/DD/YY

DAP NO.2 - VINACHEM PROJECT

DAP NO.2 VINACHEM JSC

TTCL CECO VINAINCON

ABBR. FOR ISSUE
C=CUSTOMER
L=LICENSOR
F=FIELD
V=VENDOR

TTCL

บริษัท โตโย-ไทย คอร์ปอเรชั่น จำกัด (มหาชน)
TOYO-THAI CORPORATION PUBLIC COMPANY LIMITED

TTCL JOB No. F-032 | ACCOUNT | CUSTOMER'S ORDER No.

ISSUE MARK

/ /

POLYTUBE HEAT EXCHANGER Items 21-E401A/B
70" V01 PYTIC 6 20' 51/38 4 733

1/5

SCALE

DWG. No. 21E401-11-002

–	–	–	–	–	–	–
		–	–	–	–	
–	–	–	–	–	–	–
		–	–	–	–	
–	–	–	–	–	–	–
		–	–	–	–	
16	1	Safety valve	–	–	Steel	–
		Vanne de sureté 1"1/2-2" ANSI 150	–	–	Acier	
15	1	Blind flange	ASTM SA312/240	NF EN 10204 3.1	S.S. 316L	–
		Bride pleine 1/2" ANSI150	–	–	S.S. 316L	
14	2	Blind flange	ASTM A105	NF EN 10204 3.1	A105	26950
		Bride pleine 1/2" ANSI150	–	–	A105	
13	1	Blind flange	ASTM SA312/240	NF EN 10204 3.1	S.S. 316L	–
		Bride pleine 2" ANSI150	–	–	S.S. 316L	
12	36	Special washer	–	NF EN 10204 2.2	A283GrC	4.50552
		Rondelle de serrage	–	–	A283GrC	
11	36	Spring	–	NF EN 17221 3.1	50CV4	41803
		Ressort	–	–	50CV4	
10	36	Spring house drilled dia.26	–	NF EN 10204 2.2	Steel	49216-26
		Boitier ressort perce dia.26	–	–	Acier	
09	2	Centering ring	ASTM A516	NF EN 10204 3.1	A516Gr70	3.47750
		Anneau de centrage	–	–	A516Gr70	
08	2	Half ring	ASTM A105	NF EN 10204 3.1	A105	3.47749
		Demi-bague	–	–	A105	
07	1	Counter flange	ASTM A105	NF EN 10204 3.1	A105	3.47748
		Contre bride	–	–	A105	
06	1	Sliding gasket flange	ASTM A105	NF EN 10204 3.1	A105	3.47747
		Bride de joint coulissant	–	–	A105	
05	1	Fixed side intermediate flange	ASTM A105	NF EN 10204 3.1	A105	3.47746
		Bride intermédiaire côté fixe	–	–	A105	
04	1	Shell	ASTM A516 - ASTM A106	NF EN 10204 3.1	A106GrB-316L	1.32198
		Enveloppe	ASTM A105 - ASTM A312/240	–	A105-A516Gr70	
03	1	Floating side rubber lined header	ASTMA516/ASTMA105	NF EN 10204 3.1	A106GrB	1.32197
		Couvercle côté coulissant ébonité	ASTM A106	–	A516Gr70+A105	
02	1	Fixed side rubber lined header	ASTMA516/ASTMA105	NF EN 10204 3.1	A106GrB	1.32196
		Couvercle côté fixe ébonité	ASTM A106	–	A516Gr70+A105	
01	1	Bundle	ADM	NF EN 10204 3.1	GRAPHILOR BS	1.32195
		Faisceau	N2	–	GRAPHILOR BS	
Item	Nr	Designation	Norme	Certificate	Material	Drawing
Rep.	Nb	Designation	Norme	Certificat	Matière	Plan

REV.	DATE	OBJET DE LA REVISION – DESCRIPTION OF THE REVISION	PAR BY	VERIFIE CHECKED
02	02/12/13	Changed quantity Item 61	LOS	CHD
01	26/02/13	Updated after customer's requests dated 22-02-13	LOS	CHD
00	04/02/13	VERSION D'ORIGINE ORIGINAL DRAWING	LOS	CHD

CLIENT – CUSTOMER TOYO THAI

No DE COMMANDE-ORDER Nb F032-TTCL/MERSEN-LI-001

No D'AFFAIRE-MERSEN's JOB Nb

No DE COMMANDE-MERSEN's ORDER Nb APP 215565

D'APRES PLAN-ACCORDING TO

PLAN D'ENSEMBLE-ASSEMBLY DRAWING 0.21941

POLYTUBE HEAT EXCHANGER Items 21-E401A/B

70" V01 PYTIC 6 24' 51/38 4 733

Echelle-Scale 1/

PLAN No-DRAWING Nb

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REV. | 00 | 01 | 02 |

MERSEN

44	72	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	–
		Ecrou HM24	–	–	A194 2H Zinc	
43	72	Washer	–	NF EN 10204 2.2	S275JR Zinc	–
		Rondelle M24	–	–	S275JR Zinc	
42	36	Tie-rod	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	–
		Tirant ø24x1200 filete M24 50-50	–	–	A193B7 Zinc	
41	36	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	–
		Ecrou HM16	–	–	A194 2H Zinc	
40	36	Washer	–	NF EN 10204 2.2	S275JR Zinc	–
		Rondelle M16	–	–	S275JR Zinc	
39	18	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	–
		Tige filetee M16x400	–	–	A193B7 Zinc	
38	36	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	–
		Ecrou HM20	–	–	A194 2H Zinc	
37	36	Washer	–	NF EN 10204 2.2	S275JR Zinc	–
		Rondelle M20	–	–	S275JR Zinc	
36	18	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	–
		Tige filetee M20x280	–	–	A193B7 Zinc	
35	112	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	–
		Ecrou HM24	–	–	A194 2H Zinc	
34	112	Washer	–	NF EN 10204 2.2	S275JR Zinc	–
		Rondelle M24	–	–	S275JR Zinc	
33	56	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	–
		Tige filetee M24x760	–	–	A193B7 Zinc	
32	112	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	–
		Ecrou HM16	–	–	A194 2H Zinc	
31	112	Washer	–	NF EN 10204 2.2	S275JR Zinc	–
		Rondelle M16	–	–	S275JR Zinc	
30	56	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	–
		Tige filetee M16x880	–	–	A193B7 Zinc	
–	–	–	–	–	–	–
		–	–	–	–	
28	4.4	Gasket	–	–	PTFE	
		Joint tresse 30x6 2xlg=2200	–	–	PTFE	
27	1	Connection gasket	–	–	PTFE+AF+SS	39914
		Joint de raccordement 1"1/2	–	–	PTFE+AF+SS	
26	3	Connection gasket	–	–	PTFE+AF+SS	39915
		Joint de raccordement 1/2"	–	–	PTFE+AF+SS	
25	1	Connection gasket	–	–	PTFE+AF+SS	39900
		Joint de raccordement 2"	–	–	PTFE+AF+SS	
24	1	Protection pad ø1900/1805x2	–	–	Asbestos free P	
		Plaque de protection ø1900/1805x2	–	–	Asbestos free P	
23	11.6	Sliding gasket	–	–	PTFE	39699
		Joint tresse 20x20 2xlg=5800	–	–	PTFE	
22	5.8	Sliding gasket	–	–	GRAPHITE	
		Joint tresse 20x20 1xlg=5800	–	–	GRAPHITE	
21	6	Gasket	–	–	PTFE	
		Joint tresse 40x6 1xlg=6000	–	–	PTFE	
20	11.4	Gasket	–	–	PTFE	
		Joint tresse 30x6 2xlg=5700	–	–	PTFE	
Item	Nr	Designation	Norme	Certificate	Material	Drawing
Rep.	Nb	Designation	Norme	Certificat	Matière	Plan

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61	1	Impact recorder	-	-	-	39992
		Detecteur de chocs	-	-	-	
60	1	MERSEN's name plate	-	-	Stain. steel 304	39473
		Plaque d'identite MERSEN	-	-	Inox 304	
-	-	-	-	-	-	-
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57	24	Screw CHc M8-25	-	NF EN 10204 3.1	SS 304	-
		Vis CHc M8-25	-	-	Inox 304	
56	80	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM30	-	-	A194 2H Zinc	
55	80	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M30	-	-	S275JR Zinc	
54	40	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M30x210	-	-	A193B7 Zinc	
53	8	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM12	-	-	A194 2H Zinc	
52	8	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M12	-	-	S275JR Zinc	
51	4	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M12x80	-	-	A193B7 Zinc	
50	24	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM12	-	-	A194 2H Zinc	
49	24	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M12	-	-	S275JR Zinc	
48	12	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M12x65	-	-	A193B7 Zinc	
47	8	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM16	-	-	A194 2H Zinc	
46	8	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M16	-	-	S275JR Zinc	
45	4	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M16x100	-	-	A193B7 Zinc	
Item	Nr	Designation	Norme	Certificate	Material	Drawing
Rep.	Nb	Designation	Norme	Certificat	Matière	Plan

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56	8	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM30	-	-	A194 2H Zinc	
55	8	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M30	-	-	S275JR Zinc	
54	4	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M30x210	-	-	A193B7 Zinc	
53	4	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM12	-	-	A194 2H Zinc	
52	4	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M12	-	-	S275JR Zinc	
51	2	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M12x80	-	-	A193B7 Zinc	
50	4	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM12	-	-	A194 2H Zinc	
49	4	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M12	-	-	S275JR Zinc	
48	2	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M12x65	-	-	A193B7 Zinc	
47	4	Nut	ASTM A194	NF EN 10204 3.1	A194 2H Zinc	-
		Ecrou HM16	-	-	A194 2H Zinc	
46	4	Washer	-	NF EN 10204 2.2	S275JR Zinc	-
		Rondelle M16	-	-	S275JR Zinc	
45	2	Threaded stem	ASTM A193	NF EN 10204 3.1	A193B7 Zinc	-
		Tige filetee M16x100	-	-	A193B7 Zinc	

SPARE PARTS - BOLTS AND NUTS 10%

28	8.8	Gasket	-	-	PTFE	
		Joint tresse 30x6 4xlg=2200	-	-	PTFE	
27	2	Connection gasket	-	-	PTFE+AF+SS	39914
		Joint de raccordement 1"1/2	-	-	PTFE+AF+SS	
26	6	Connection gasket	-	-	PTFE+AF+SS	39915
		Joint de raccordement 1/2"	-	-	PTFE+AF+SS	
25	2	Connection gasket	-	-	PTFE+AF+SS	39900
		Joint de raccordement 2"	-	-	PTFE+AF+SS	
24	2	Protection pad ø1900/1805x2	-	-	Asbestos free P	
		Plaque de protection ø1900/1805x2	-	-	Asbestos free P	
23	23.2	Sliding gasket	-	-	PTFE	39699
		Joint tresse 20x20 4xlg=5800	-	-	PTFE	
22	11.6	Sliding gasket	-	-	GRAPHITE	
		Joint tresse 20x20 2xlg=5800	-	-	GRAPHITE	
21	12	Gasket	-	-	PTFE	
		Joint tresse 40x6 2xlg=6000	-	-	PTFE	
20	22.8	Gasket	-	-	PTFE	
		Joint tresse 30x6 4xlg=5700	-	-	PTFE	

SPARE PARTS - GASKET 200%

Item	Nr	Designation	Norme	Certificate	Material	Drawing
Rep.	Nb	Designation	Norme	Certificat	Matière	Plan

MERSEN

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