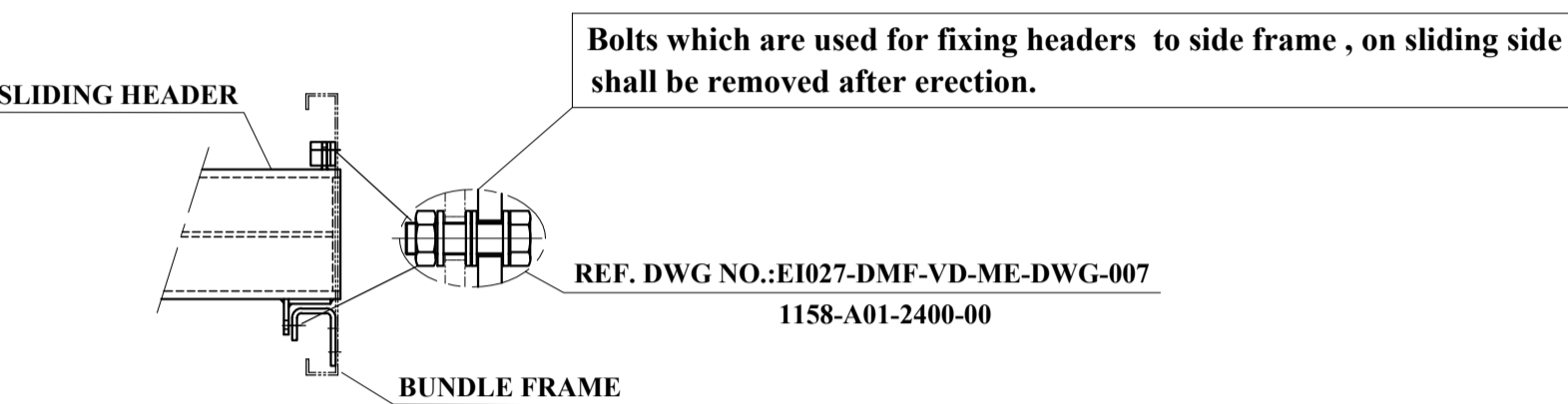
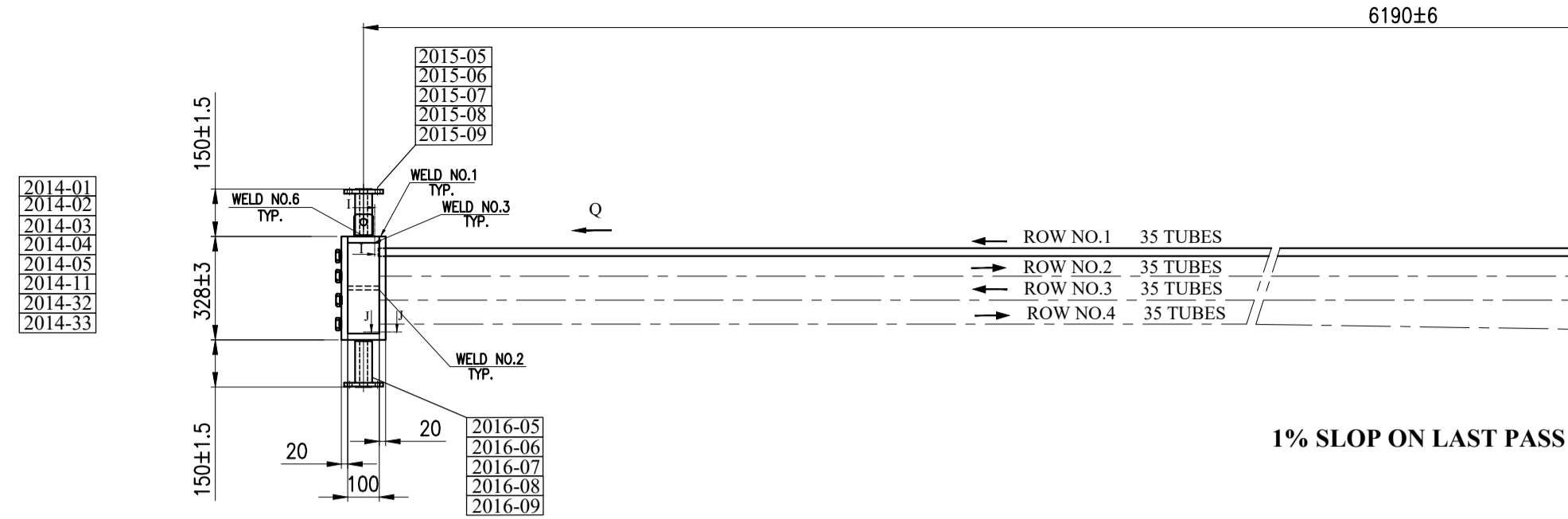
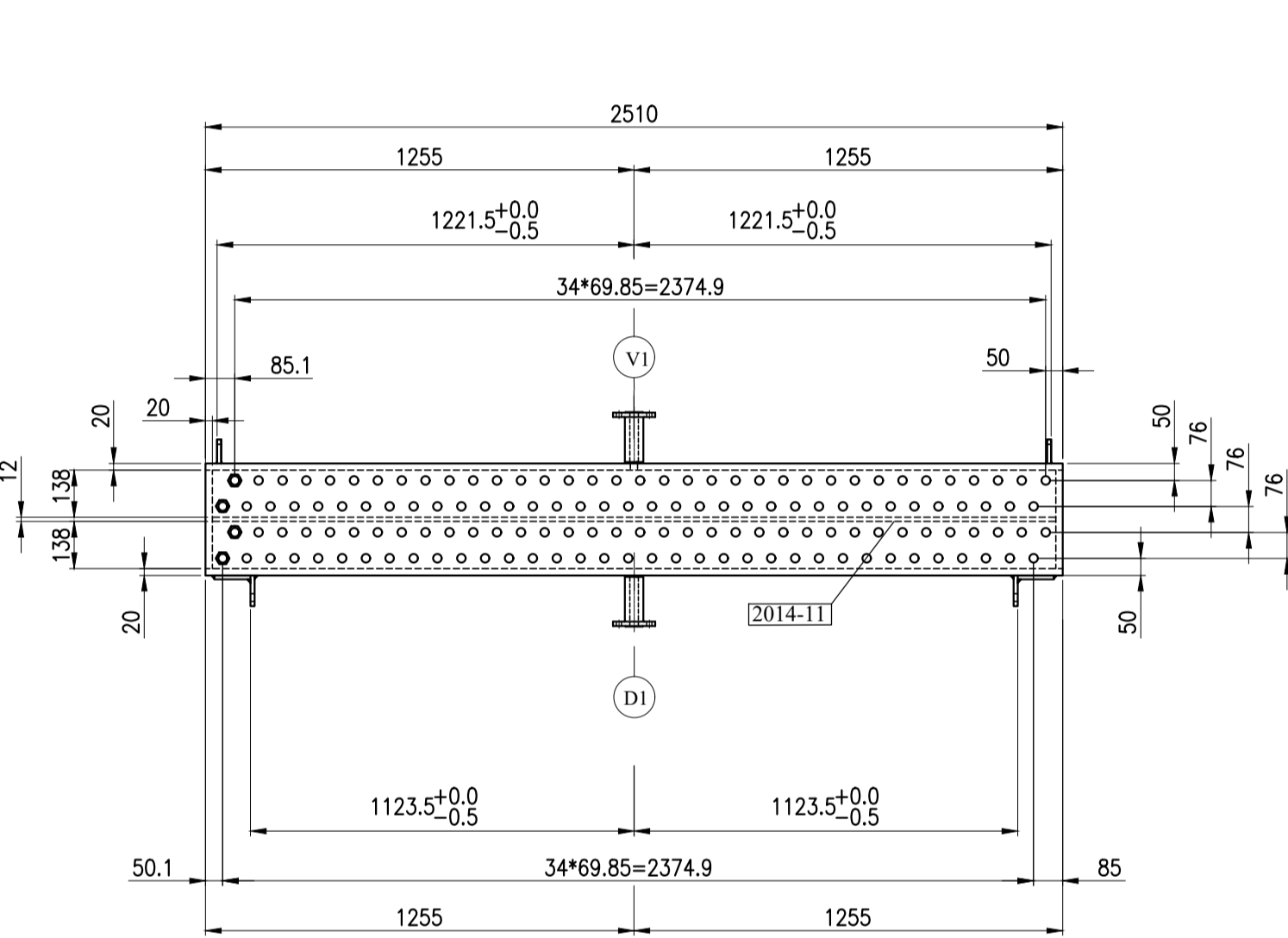


**REAR HEADER (SLIDING HEADER)**

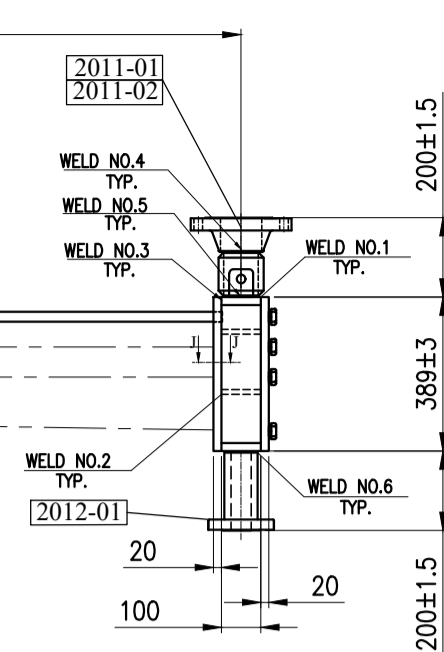


**DETAIL OF BOLTS FOR FIXING HEADER & TRANSPORTATION**

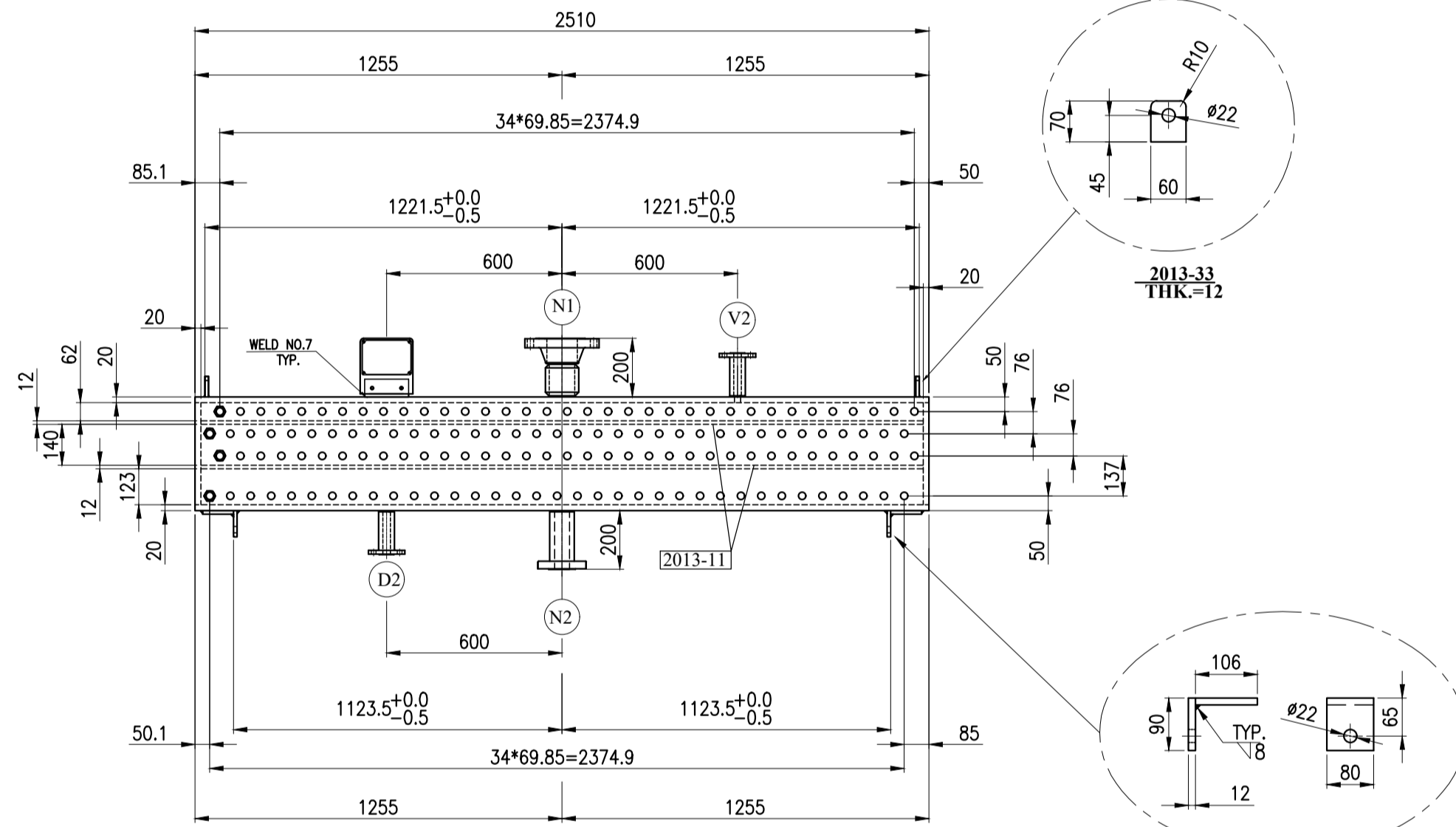


**VIEW FROM "Q" REAR HEADER**

**FRONT HEADER (FIXED HEADER)**



1% SLOP ON LAST PASS



**VIEW FROM "P" FRONT HEADER**

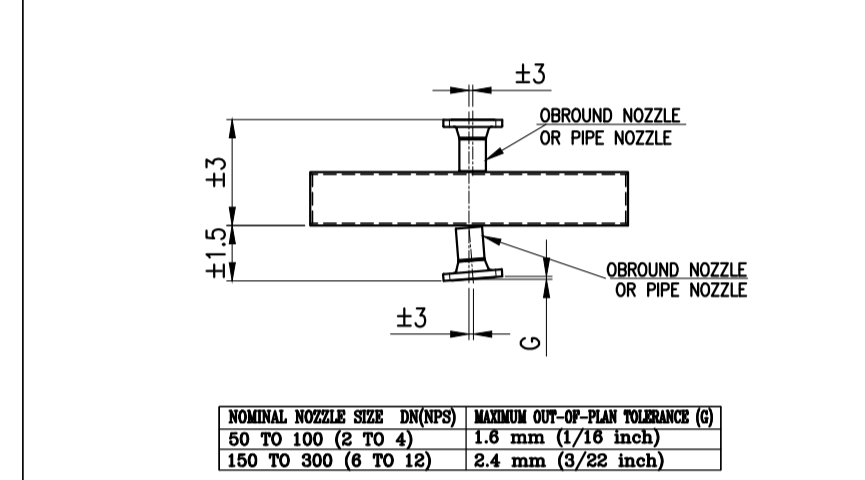
- NOTES:**  
 1- ALL DIMENSIONS ARE IN MILLIMETERS.  
 2- ALL NOZZLE FACINGS SHALL BE PROTECTED BY COVER AND 4 BOLTS.  
 3- FLANGE CONTACT FACES SHALL BE COATED WITH GREASE.  
 4- ALL FLANGE BOLTS SHALL STRADDLE MAIN AXES.  
 5- ALL ENGINEERING AND MANUFACTURING CHARACTERISTICS NOT MENTIONED ON THIS DRAWING ARE INDICATED ON THE FOLLOWING APPLICABLE DOCUMENTS:  
 A- CALCULATION BOOK  
 B- WELDING PROCEDURE SPECIFICATION (W.P.S.)  
 C- NON DESTRUCTIVE TEST CHECK LIST (N.D.T.)  
 D- PAINTING & GALVANIZING SPECIFICATION SHEETS  
 6- HEADER PLUG THREADS SHALL BE COVERED BY ANTISEIZE GREASE PROPER FOR 200°C TEMPERATURE.  
 7- THE MATERIAL OF THE SLIDING PAD BETWEEN THE BUNDLE FRAME AND THE HEADER IS TEFLO(PTFE). FOR MORE INFORMATION, REFER TO DWG. NO. E1027-DMF-VD-ME-DWG-007  
 8- MATERIAL FOR PLATE(S) FOR PRESSURE PART) TO BE IMPACT TESTED.

**THE MAXIMUM ALLOWABLE MOMENTS AND FORCES PER EACH NOZZLE (IF LOADS ARE DIVIDED EQUALLY FOR NOZZLES ACCORDING TO 3xAPI 661(7.1.10.1))**

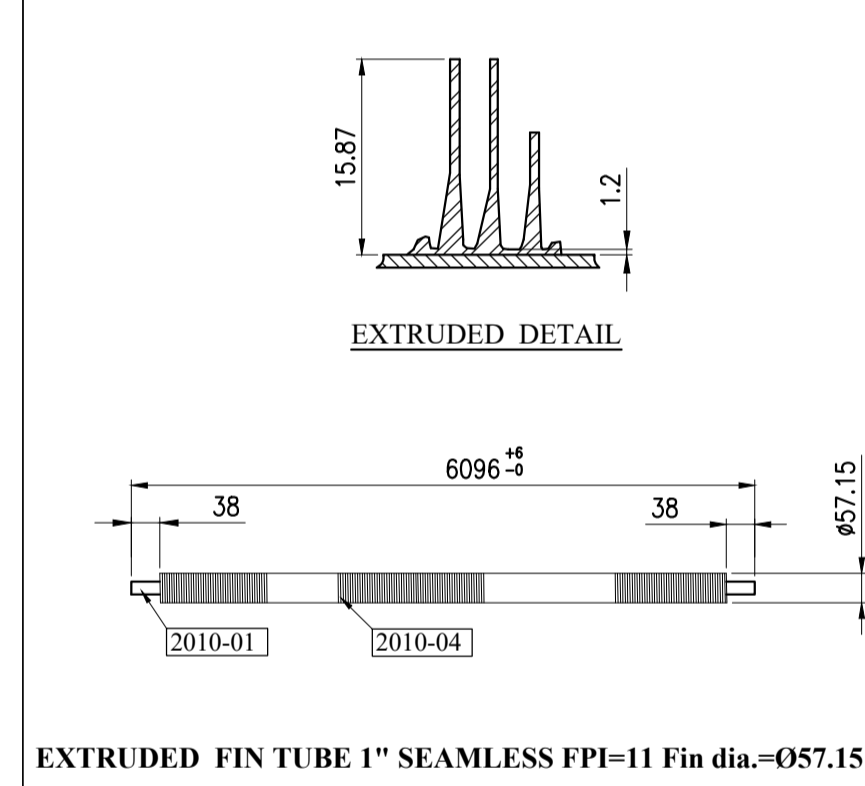
SIZE	Fx(N)	Fy(N)	Fz(N)	Mx(N.m)	My(N.m)	Mz(N.m)
4"	10020	8010	10020	2430	3660	2430
2"	3060	3990	3060	450	720	450

**LATERAL DISPLACEMENT OF HEADERS (DIRECTION Z) INSIDE BUNDLE FRAME IN RELATION WITH EXPANSION FORCES ON NOZZLES (mm) (ACCORDING TO API661 7-1-1-2)**  
 MAXIMUM DISPLACEMENT OF FRONT AND REAR HEADER(Z DIRECTION) INLET/OUTLET : ±9

**NOZZLE ALIGNMENT TOLERANCES**



**FIN TUBE DETAIL**



**EXTRUDED FIN TUBE 1" SEAMLESS FPI=11 Fin dia.=Ø57.15**

PART NO.	DESCRIPTION	DIMENSIONS			MATERIAL	QTY.	UNIT WEIGHT (Kg)	TOTAL WEIGHT (Kg)	STD DWG	REV.
		Ø	LENGTH	THK						
2000-00	TUBE BUNDLE INCLUDING :	-	-	-	-	2	2927.9	5844	-	-
2010-00	EXTRUDED FINNED TUBE INCLUDING :	-	-	-	-	-	-	-	-	-
2010-01	BASE TUBE 1" (SEAMLESS-MN WALL-BWG16)	25.4	6096	1.65	SA-334 Gr.6	140	6.5	913.2	-	-
2010-04	ALUMINIUM TUBE	35.75	5212.08	4.9	AL-1060	140	7.8	1097.5	-	-
2011-00	INLET NOZZLE INCLUDING :	-	-	-	-	-	-	-	-	-
2011-01	PIPE NOZZLE 4", SCH 160 (SEAMLESS)	107	-	13.49	SA-333 Gr.6	1	3.9	3.9	-	-
2011-02	FLANGE 4" (ANSI B16.5, 300# W.N.R.F)	254	86	-	SA-350 LF2 CL.1N	1	7.1	7.1	-	-
2012-00	OUTLET NOZZLE INCLUDING :	-	-	-	-	-	-	-	-	-
2012-01	NOZZLE 2" (ANSI B16.5, 300# W.N.R.F)	165	196	16.6	SA-350 LF2 CL.1N	1	3.5	3.5	-	-
2013-00	FRONT HEADER INCLUDING :	-	-	-	-	-	-	-	-	-
2013-01	TUBE SHEET	-	2510	389	20	-	1	153.3	153.3	R3
2013-02	PLUG SHEET	-	2510	389	20	-	1	153.3	153.3	R3
2013-03	TOP PLATE	-	2510	100	20	-	1	39.4	39.4	R3
2013-04	BOTTOM PLATE	-	2510	100	20	-	1	39.4	39.4	R3
2013-05	END PLATE	-	349	100	20	-	2	5.5	11.0	R3
2013-11	PARTITION	-	2470	100	12	-	2	23.3	46.5	-
2013-32	SLIDING PAD	-	10560	80	12	-	2	1.6	3.1	-
2013-33	FIXING	-	70	60	12	-	2	0.4	0.8	-
2014-00	REAR HEADER INCLUDING :	-	-	-	-	-	-	-	-	-
2014-01	TUBE SHEET	-	2510	328	20	-	1	129.3	129.3	R3
2014-02	PLUG SHEET	-	2510	328	20	-	1	129.3	129.3	R3
2014-03	TOP PLATE	-	2510	100	20	-	1	39.4	39.4	R3
2014-04	BOTTOM PLATE	-	2510	100	20	-	1	39.4	39.4	R3
2014-05	END PLATE	-	288	100	20	-	2	4.5	9.0	R3
2014-11	PARTITION	-	2470	100	12	-	1	23.3	23.3	-
2014-32	SLIDING PAD	-	10660	80	12	-	2	1.6	3.1	-
2014-33	FIXING	-	70	60	12	-	2	0.4	0.8	-
2015-00	VENT INCLUDING :	-	-	-	-	-	-	-	-	-
2015-01	FLANGE LWN 1" 300# R.F	124	146	14.3	SA-350 LF2 CL.1N	2	2.0	4.0	-	-
2015-02	BLIND FOR FLANGE LWN 1" 300# R.F	-	-	-	SA-350 LF2 CL.1N	2	1.5	3.0	-	-
2015-03	GASKET FOR FLANGE LWN 1" 300# R.F	-	-	-	SPRAL WOUND INNER: S304, OUTER: C.S GRAPHITE FILLED	2	-	-	-	-
2015-04	STUD BOLT FOR FLANGE, LWN 1" 300# R.F	M16	80	-	SA-320 Gr.7(Dacromet)	8	-	-	-	-
2015-05	NUT	M16	-	-	SA-194 Gr.7(Dacromet)	16	-	-	-	-
2016-00	DRAIN INCLUDING :	-	-	-	-	-	-	-	-	-
2016-01	FLANGE LWN 1" 300# R.F	124	146	14.3	SA-350 LF2 CL.1N	2	2.0	4.0	-	-
2016-02	BLIND FOR FLANGE LWN 1" 300# R.F	-	-	-	SA-350 LF2 CL.1N	2	1.5	3.0	-	-
2016-03	GASKET FOR FLANGE LWN 1" 300# R.F	-	-	-	SPRAL WOUND INNER: S304, OUTER: C.S GRAPHITE FILLED	2	-	-	-	-
2016-04	STUD BOLT FOR FLANGE, LWN 1" 300# R.F	M16	80	-	SA-320 Gr.7(Dacromet)	8	-	-	-	-
2016-05	NUT	M16	-	-	SA-194 Gr.7(Dacromet)	16	-	-	-	-
2020-00	MISCELLANEOUS PARTS INCLUDING :	-	-	-	-	-	-	-	-	-
2020-01	PLUG (1 1/8" 12 UNF CL.2A)	-	-	-	SA-350 LF2 CL.1N	200	0.22	61.6	2201	-
2020-02	PLUG GASKET	2695.5	-	1.5	SOFT IRON	200	-	-	2300	-
2020-03	STAND FOR BRACKET	150	60	5	C.S	1	0.35	0.7	-	-

**NOZZLES TABLE**

MARK NO.	SERVICE	SIZE	NOZZLE MATERIAL	FLANGE MATERIAL	RATING	TYPE	FACING	SCH. THK.	FLANGE FACE FINISHING	QTY. PER BUNDLE	ITEM
N1	INLET NOZZLE	4"	SA-333 Gr.6	SA-350 LF2 CL.1N	300#	W.N	R.F	160	125-250 µH	1	2
N2	OUTLET NOZZLE	2"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	R.F	16.6	125-250 µH	1	2
V1, V2	VENT WITH BLIND & GASKET	1"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	-	-	-	2	4
D1, D2	DRAIN WITH BLIND & GASKET	1"	SA-350 LF2 CL.1N	SA-350 LF2 CL.1N	300#	LWN	-	-	-	2	4

**APPLICABLE CODES AND STANDARDS**  
 ASME VIII-DIV.1 2019, API 661

SERVICE	PROpane
MAXIMUM DESIGN TEMPERATURE (°C)	120
MINIMUM AMBIENT TEMPERATURE (°C)	5
MINIMUM DESIGN METAL TEMPERATURE (°C)	-45
DESIGN PRESSURE ( barg )	22±F.V
TEST PRESSURE ( barg )	28.6
CORROSION ALLOWANCE	3
WELD JOINT EFFICIENCY	0.6 FOR PARTITION / 0.85 FOR OTHER PARTS
HYDROTEST	YES
POST WELD HEAT TREATMENT	YES
N.D.T. EXAMINATION OF WELDED JOINTS	SEE NDT CHECK LIST
TUBE TO TUBE SHEET JOINT	STRENGTH WELD + EXPANDED
BUNDLE CAPACITY ( m <sup>3</sup> )	0.480
BUNDLE WEIGHT WITH FRAME (EMPTY) ( Kg )	2920
BUNDLE WEIGHT WITH FRAME (FULL OF WATER) ( Kg )	3400
ULTRASONIC TEST(NOZZLE TO HEADER)	YES

**REFERENCE DOCUMENTS**

TITLE	VENDOR DOCUMENT NO.	CLIENT DOCUMENT NO.
GENERAL ARRANGEMENT	1158-A01-1000-00	E1027-DMF-VD-ME-DWG-003
BUNDLE FRAME	1158-A01-2400-00	E1027-DMF-VD-ME-DWG-007
AIR COOLER DATA SHEET	1158-A01-0010-00	E1027-DMF-VD-ME-DWG-002
MECHANICAL CALCULATION	1158-A01-0020-00	E1027-DMF-VD-ME-CAL-006
WELDING PROCEDURE SPECIFICATION (W.P.S.)	1158-A01-0060-00	E1027-DMF-VD-QC-WPS-021
NON DESTRUCTIVE TEST CHECK LIST (N.D.T.)	1158-A01-0070-00	E1027-DMF-VD-QC-PRO-022

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY	FINAL APPROVED BY
R3	07/31/2024	ISSUED FOR APPROVAL	F.S.Z	S.S	J.B.L	A.GHZ
R2	07/22/2024	ISSUED FOR APPROVAL	F.S.Z	S.S	J.B.L	A.GHZ
R1	06/26/2024	ISSUED FOR APPROVAL	F.S.Z	S.S	J.B.L	A.GHZ
R0	06/02/2024	ISSUED FOR APPROVAL	F.S.Z	S.S	J.B.L	A.GHZ

CLIENT: CONTRACTOR:

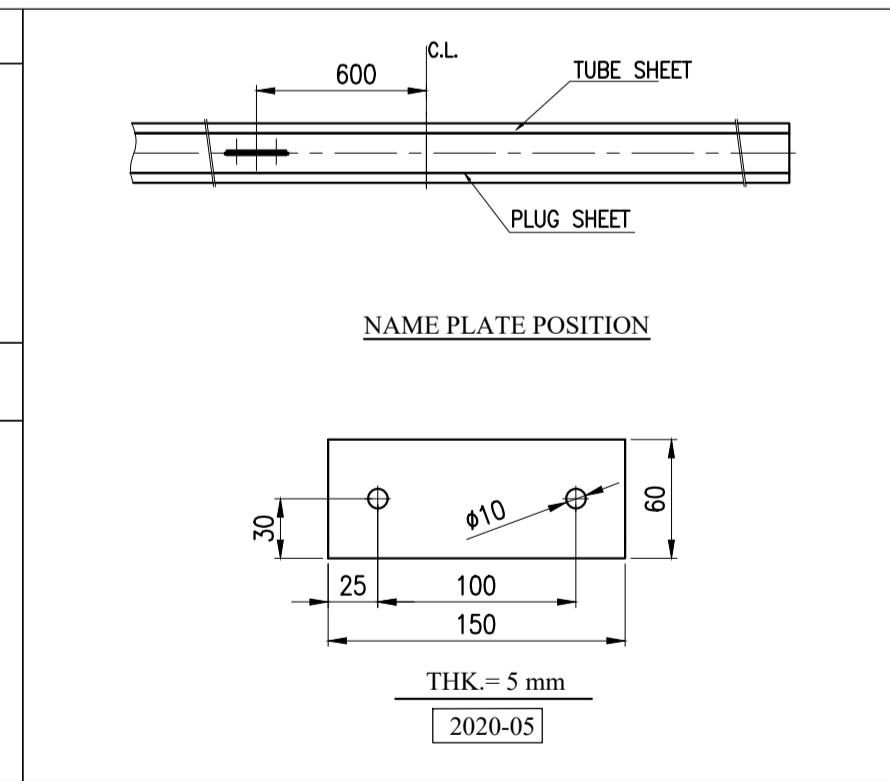
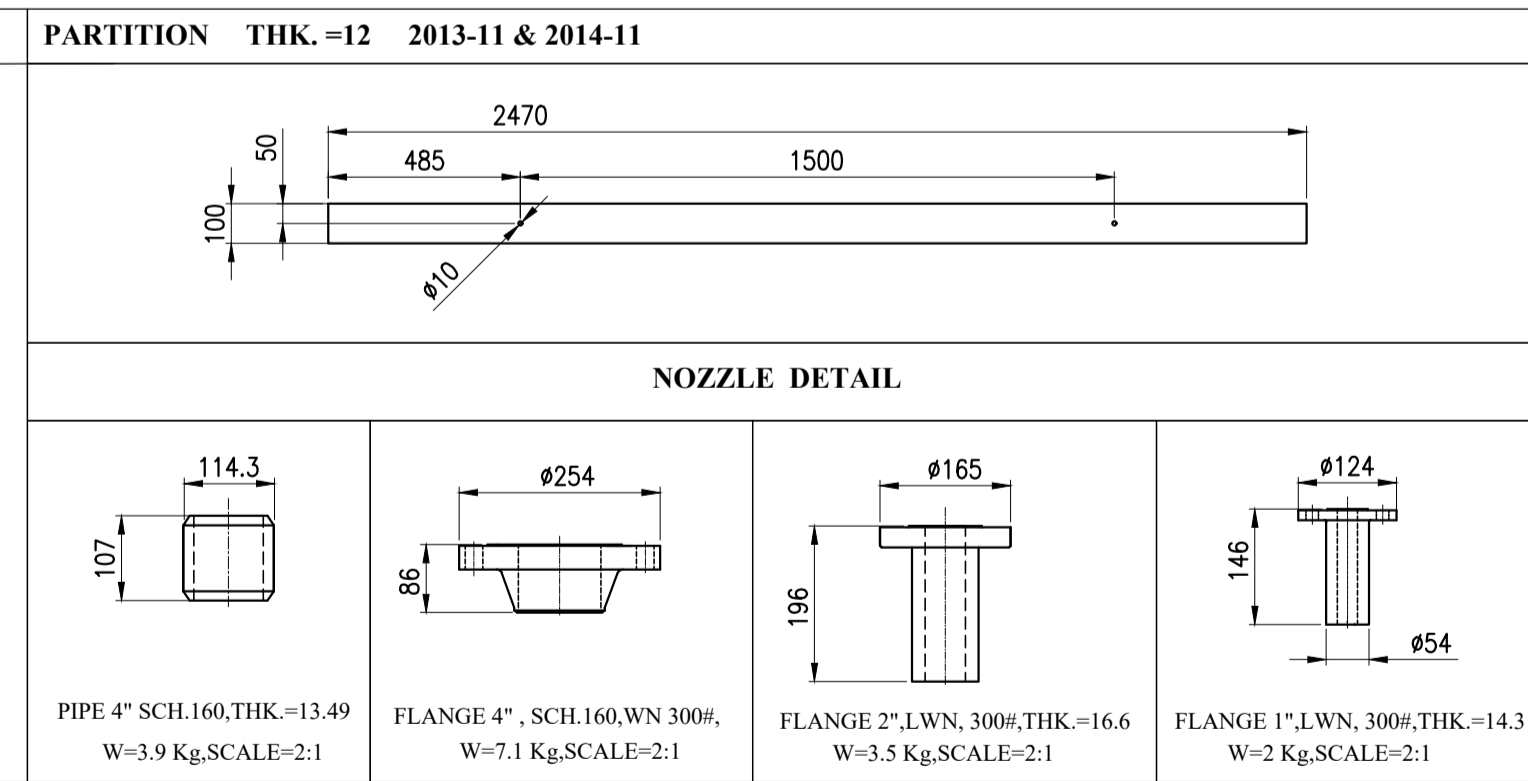
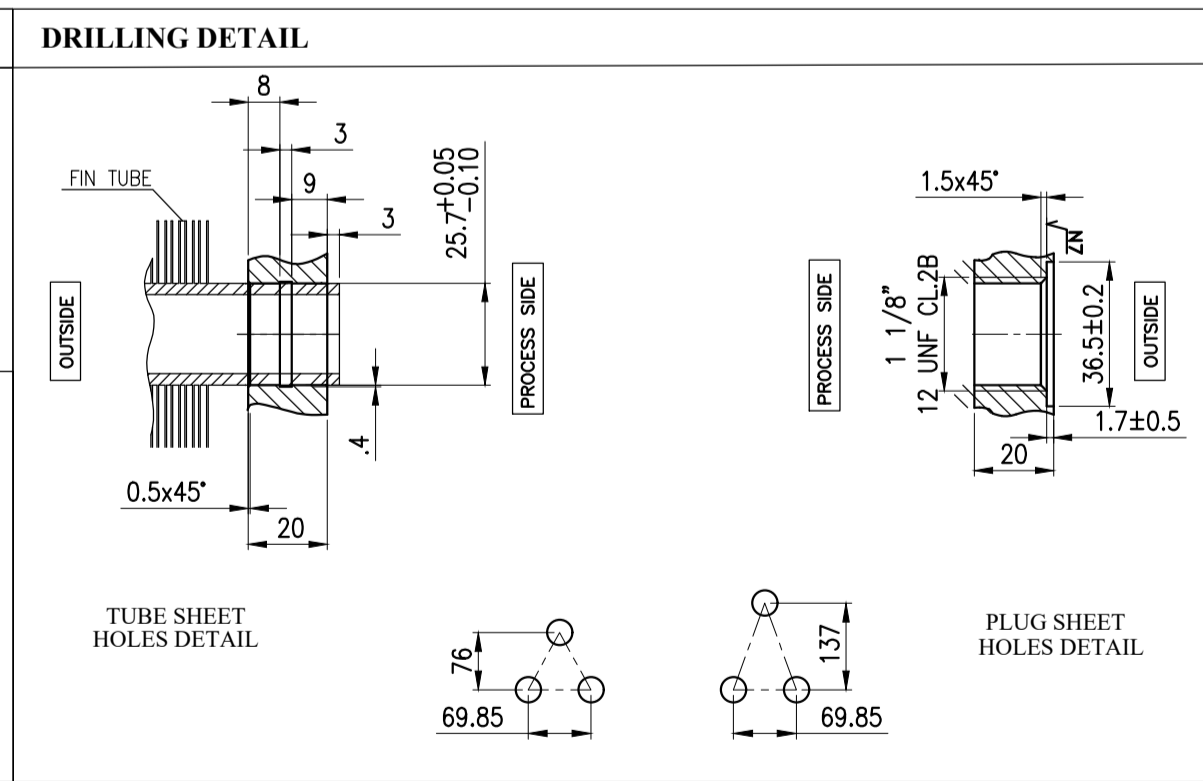
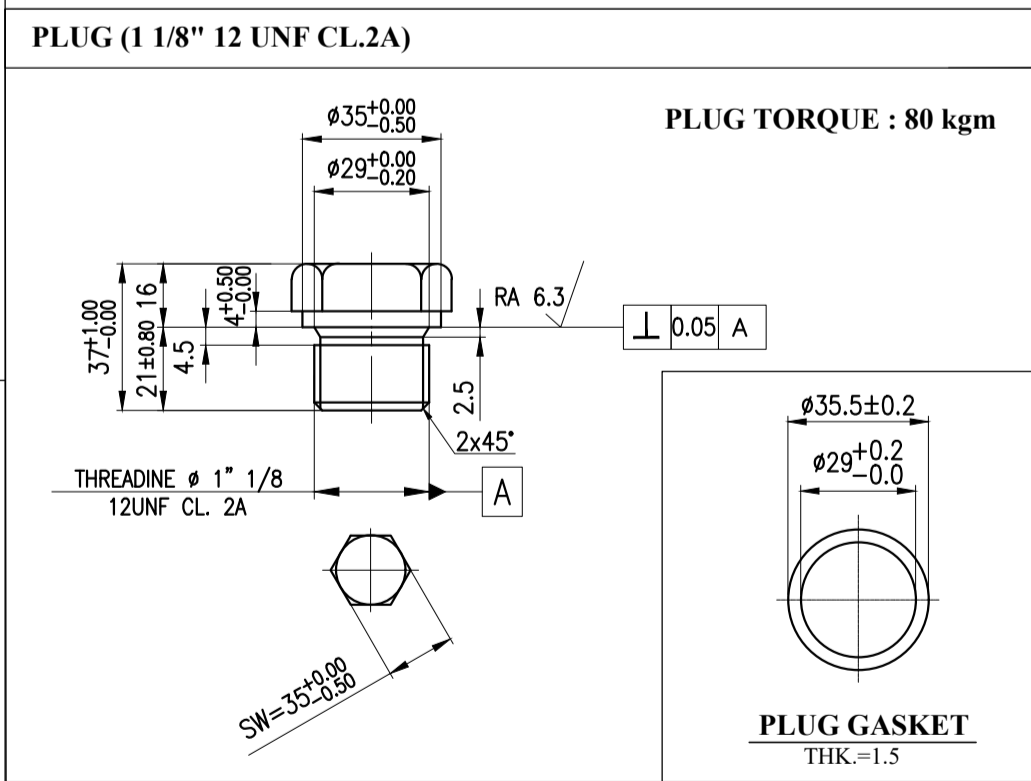
**ENBR TEKNOLOJİ**

PROJECT :  
**AIR COOLER FOR**  
 Toase-che Park Sanati Gohar Ofogh Petrochemical Co.

**TUBE BUNDLE DRAWING**  
 1158-A01-2000-00  
 DWG. NO. E1027-DMF-VD-ME-DWG-005  
 SCALE: N.T.S. SIZE: A1 REV.: R3

**dt Damafin thermal technology**  
 Factory : Km 14 special Karaj road

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