



STEEL BUTTWELDING FITTINGS

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FOOLAD ASA INDUSTRIES TRADING COMPANY

"Introduction"

FOOLAD ASA Industries Company has been established in 1990 and is specialized in designing and manufacturing Seamless Carbon Steel Buttwelding Fittings of sizes 1/2" to 48" according to ASME B16.9 & ASME B16.28 standard. Other international standards can be also manufactured upon the clients' order. In addition to exporting some of our products, our main clients are:

- 1) National Iranian Oil Company.
- 2) National Iranian Gas Company.
- 3) National Iranian Petrochemical Company.
- 4) All Companies that supply equipment for Iranian Oil, Gas & Petrochemical industries.

All stages of designing, production and providing clear technical documentation related to our products are carried out through the experienced personnel by the latest computerized devices (CAD-CAM).

PRODUCTION EQUIPMENT & MACHINERIES: The plant possesses the most modern single and multi-purpose machineries for manufacturing of fittings in different sizes, standards and materials at the same time to fulfill in supplying the clients' ordered quantity on the promised time.

QUALITY CONTROL LABORATORY: ASA's technological laboratory carries out destructive and non-destructive tests whenever required at the presence of customers or their representative by the latest advanced testing and measuring equipment by the skilled specialists.

TRADING: ASA, in addition to being well-known as a leading manufacturer and exporter of fittings in the Middle East, also imports the required raw material for its production line as well as for the clients.

EMPLOYEES:

Administrative Dept.....	25
Marketing and Trade Dept.....	5
Engineering and Quality Control Dept.....	7
Supervisors and Workers.....	80

LOCATION: At a distance of 18(km) from Zanjan to Tehran.

CONSTRUCTIONAL MENSURATION:

Roofed Production Hall.....	8000 Sq.M.
Finished Products' Warehouse	2000 Sq.M.
Administrative Offices & Gate Guard House	400 Sq.M.
Raw Material Storage Open Area.....	50000 Sq.M.



Applicable Standards

ASME Standards

- B16.9 Factory-Made Wrought Steel Butt welding Fittings
- B16.28 Wrought Steel Butt welding Short Radius Elbows and Returns
- B16.25 Butt welding Ends
- B36.10 Welded and Seamless Wrought Steel Pipe
- B36.19 Stainless Steel Pipe

ASTM Standards

- A234 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
- A403 Wrought Austenitic Stainless Steel Piping Fittings
- A420 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low Temperature Service
- A815 Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings

MSS Standards

- SP-43 Wrought Stainless Steel Butt-Welding Fittings
- SP-75 High Test Wrought Butt-Welding Fittings
- SP-79 Socket Welding Reducer Inserts
- SP-87 Factory-Made Butt-Welding Fittings for Class I Nuclear Piping Applications

EN (European) Standards

- 10204 Inspection Documents for Metallic Products
- 10253-1 Butt-Welding Pipe Fittings; Wrought Carbon Steel for General Use and Without Specific Inspection Requirements

NACE Standards

- MR0175 Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment



Quality Control/Inspection Procedures

Final Inspections

FOOLAD ASA butt welding fittings are subject to the following final inspections before they are packed and delivered.

1. Visual Inspection

Both internal and external surfaces are checked to confirm they are smooth and do not bear any harmful defects.

2. Dimensional Inspection

Done to ensure that all fittings are in conformity with dimensional tolerances of relevant Codes and standards.

3. Special Inspection

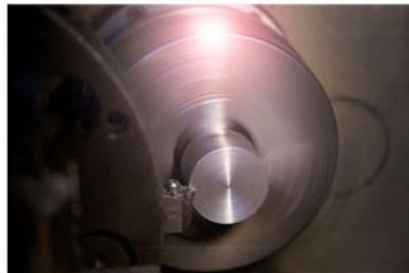
Non-destructive examinations and mechanical tests are performed as per customer's Request

4. Certification

FOOLAD ASA inspection certificates are issued in accordance with DIN 50049/EN10204 unless otherwise requested by customers.

Third-Party Inspections

FOOLAD ASA butt welding fittings subject to this inspection are made from starting materials stipulated by the regulations of the inspection body, e.g. I E I , I T I , S G S , etc. The starting materials and finished products are inspected for appearance, dimensions, and conformity to designated codes and specifications. The inspection body witnesses and certifies the inspections and issues certificates or report of findings to customers.



Quality Control/Inspection Procedures

FOOLAD ASA Controls the entire manufacturing process. All fittings are subject to strict in-process inspection at each stage of the production process, from starting material handling to finished product shipping. They are visually examined for conformity to FOOLAD ASA company specifications and checked and tested in accordance with applicable ASTM, ASME, MSS, DIN, EN, and JIS codes and standards. Upon request, officially certified test agents can be called in to witness the inspection procedures.

Starting Material Receiving Inspections

FOOLAD ASA material inspections are carried out as follows.

1. Dimensional Inspection

Dimensions are checked at each end of the purchased material.

2. Visual Inspection

Surface check to ensure that material is correct and suitable for production of fittings.

3. Collating

Tests are done to ensure that the chemical composition and tensile properties of the described items are exactly as shown in the material certificates.

In-Process Inspections

FOOLAD ASA butt welding fittings are manufactured from carefully selected materials of the finest metallurgical quality on well-controlled jigs, tools and molds. In order to ensure that all fittings meet quality specifications, the following in-process inspections are performed.

- Visual Inspection
- Dimensional Inspection
- Shape Inspection
- Hardness Test
- Temperature Check
- Processing Conditions Check
- Material Identification (marking)
- Other Inspections



[illegible]

Nominal pipe size (NPS)		Outside Diameter		Nominal Wall Thickness									
A	B			Sch10		Sch20		Sch30		STD		Sch40	
		MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN
8	1/4	13.7	0.540	1.65	0.065	-	-	1.85	0.073	2.24	0.088	2.24	0.088
10	3/8	17.1	0.675	1.65	0.065	-	-	1.85	0.073	2.31	0.091	2.31	0.091
15	1/2	21.3	0.840	2.11	0.083	-	-	2.41	0.095	2.77	0.109	2.77	0.109
20	3/4	26.7	1.05	2.11	0.083	-	-	2.41	0.095	2.87	0.113	2.87	0.113
25	1	33.4	1.32	2.77	0.109	-	-	2.90	0.114	3.38	0.133	3.38	0.133
32	1 1/4	42.2	1.66	2.77	0.109	-	-	2.97	0.117	3.56	0.140	3.56	0.140
40	1 1/2	48.3	1.9	2.77	0.109	-	-	3.18	0.125	3.68	0.145	3.68	0.145
50	2	60.3	2.38	2.77	0.109	-	-	3.18	0.125	3.91	0.154	3.91	0.154
65	2 1/2	73.0	2.88	3.05	0.120	-	-	4.78	0.188	5.16	0.203	5.16	0.203
80	3	88.9	3.5	3.05	0.120	-	-	4.78	0.188	5.49	0.216	5.49	0.216
90	3 1/2	101.6	4	3.05	0.120	-	-	4.78	0.188	5.74	0.226	5.74	0.226
100	4	114.3	4.5	3.05	0.120	-	-	4.78	0.188	6.02	0.237	6.02	0.237
125	5	141.3	5.56	3.40	0.134	-	-	-	-	6.55	0.258	6.55	0.258
150	6	168.3	6.62	3.40	0.134	-	-	-	-	7.11	0.280	7.11	0.280
200	8	219.1	8.62	3.76	0.148	6.35	0.250	7.04	0.277	8.18	0.322	8.18	0.322
250	10	273.0	10.75	4.19	0.165	6.35	0.250	7.80	0.307	9.27	0.365	9.27	0.365
300	12	323.8	12.75	4.57	0.180	6.35	0.250	8.38	0.330	9.53	0.375	10.31	0.406
350	14	355.6	14	6.35	0.250	7.92	0.312	9.53	0.375	9.53	0.375	11.13	0.438
400	16	406.4	16	6.35	0.250	7.92	0.312	9.53	0.375	9.53	0.375	12.70	0.500
450	18	457	18	6.35	0.250	7.92	0.312	11.13	0.438	9.53	0.375	14.27	0.562
500	20	508	20	6.35	0.250	9.53	0.375	12.70	0.500	9.53	0.375	15.09	0.594
550	22	559	22	6.35	0.250	9.53	0.375	12.70	0.500	9.53	0.375	-	-
600	24	610	24	6.35	0.250	9.53	0.375	14.27	0.562	9.53	0.375	17.48	0.688
650	26	660	26	7.92	0.312	12.70	0.500	-	-	9.53	0.375	-	-
700	28	711	28	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	-	-
750	30	762	30	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	-	-
800	32	813	32	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	17.48	0.688
850	34	864	34	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	17.48	0.688
900	36	914	36	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	19.05	0.750
950	38	965	38	-	-	-	-	-	-	9.53	0.375	-	-
1000	40	1016	40	-	-	-	-	-	-	9.53	0.375	-	-
1050	42	1067	42	-	-	-	-	-	-	9.53	0.375	-	-
1100	44	1118	44	-	-	-	-	-	-	9.53	0.375	-	-
1150	46	1168	46	-	-	-	-	-	-	9.53	0.375	-	-
1200	48	1219	48	-	-	-	-	-	-	9.53	0.375	-	-

ASME B36 10 ASME B36.19											
Nominal pipe Size (NPS)		Outside Diameter		Nominal Wall Thickness							
				Sch60		XS		Sch80		Sch100	
A	B	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN
8	1/4	13.7	0.540	-	-	3.02	0.119	3.02	0.119	-	-
10	3/8	17.1	0.675	-	-	3.20	0.126	3.20	0.126	-	-
15	1/2	21.3	0.840	-	-	3.73	0.147	3.73	0.147	-	-
20	3/4	26.7	1.05	-	-	3.91	0.154	3.91	0.154	-	-
25	1	33.4	1.32	-	-	4.55	0.179	4.55	0.179	-	-
32	1 1/4	42.2	1.66	-	-	4.85	0.191	4.85	0.191	-	-
40	1 1/2	48.3	1.9	-	-	5.08	0.200	5.08	0.200	-	-
50	2	60.3	2.38	-	-	5.54	0.218	5.54	0.218	-	-
65	2 1/2	73.0	2.88	-	-	7.01	0.276	7.01	0.276	-	-
80	3	88.9	3.5	-	-	7.62	0.300	7.62	0.300	-	-
90	3 7/8	101.6	4	-	-	8.08	0.318	8.08	0.318	-	-
100	4	114.3	4.5	-	-	8.56	0.337	8.56	0.337	-	-
125	5	141.3	5.56	-	-	9.53	0.375	9.53	0.375	-	-
150	6	168.3	6.62	-	-	10.97	0.432	10.97	0.432	-	-
200	8	219.1	8.62	10.31	0.406	12.70	0.500	12.70	0.500	15.09	0.594
250	10	273.0	10.75	12.70	0.500	12.70	0.500	15.09	0.594	18.26	0.719
300	12	323.8	12.75	14.27	0.562	12.70	0.500	17.48	0.688	21.44	0.844
350	14	355.6	14	15.09	0.594	12.70	0.500	19.05	0.750	23.83	0.938
400	16	406.4	16	16.66	0.656	12.70	0.500	21.44	0.844	26.19	1.031
450	18	457	18	19.05	0.750	12.70	0.500	23.83	0.938	29.36	1.156
500	20	508	20	20.62	0.812	12.70	0.500	26.19	1.031	32.54	1.281
550	22	559	22	22.23	0.875	12.70	0.500	28.58	1.125	34.93	1.375
600	24	610	24	24.61	0.969	12.70	0.500	30.96	1.219	38.89	1.531
650	26	660	26	-	-	12.70	0.500	-	-	-	-
700	28	711	28	-	-	12.70	0.500	-	-	-	-
750	30	762	30	-	-	12.70	0.500	-	-	-	-
800	32	813	32	-	-	12.70	0.500	-	-	-	-
850	34	864	34	-	-	12.70	0.500	-	-	-	-
900	36	914	36	-	-	12.70	0.500	-	-	-	-
950	38	965	38	-	-	12.70	0.500	-	-	-	-
1000	40	1016	40	-	-	12.70	0.500	-	-	-	-
1050	42	1067	42	-	-	12.70	0.500	-	-	-	-
1100	44	1118	44	-	-	12.70	0.500	-	-	-	-
1150	46	1168	46	-	-	12.70	0.500	-	-	-	-
1200	48	1219	48	-	-	12.70	0.500	-	-	-	-

Nominal pipe Size (NPS)		Outside Diameter		Nominal Wall Thickness							
A	B	MM	IN	Sch120		Sch140		Sch160		XXS	
				MM	IN	MM	IN	MM	IN	MM	IN
6	1/4	13.7	0.540	-	-	-	-	-	-	-	-
10	3/8	17.1	0.675	-	-	-	-	-	-	-	-
15	1/2	21.3	0.840	-	-	-	-	4.78	0.188	7.47	0.294
20	3/4	26.7	1.05	-	-	-	-	5.56	0.219	7.82	0.308
25	1	33.4	1.32	-	-	-	-	6.35	0.250	9.09	0.358
32	1 1/4	42.2	1.66	-	-	-	-	6.35	0.250	9.70	0.382
40	1 1/2	48.3	1.9	-	-	-	-	7.14	0.281	10.15	0.400
50	2	60.3	2.38	-	-	-	-	8.74	0.344	11.07	0.436
65	2 1/2	73.0	2.88	-	-	-	-	9.53	0.375	14.02	0.552
80	3	88.9	3.5	-	-	-	-	11.13	0.438	15.24	0.600
90	3 1/2	101.6	4	-	-	-	-	-	-	-	-
100	4	114.3	4.5	11.13	0.438	-	-	13.49	0.531	17.12	0.674
125	5	141.3	5.56	12.70	0.500	-	-	15.88	0.625	19.05	0.750
150	6	168.3	6.62	14.27	0.562	-	-	18.26	0.719	21.95	0.864
200	8	219.1	8.62	18.26	0.719	20.62	0.812	23.01	0.906	22.23	0.875
250	10	273.0	10.75	21.44	0.844	25.40	1.000	28.58	1.125	25.40	1.000
300	12	323.8	12.75	25.40	1.000	28.58	1.125	33.32	1.312	25.40	1.000
350	14	355.6	14	27.79	1.094	31.75	1.250	35.71	1.406	-	-
400	16	406.4	16	30.96	1.219	36.53	1.438	40.49	1.594	-	-
450	18	457	18	34.93	1.375	39.67	1.562	45.24	1.781	-	-
500	20	508	20	38.10	1.500	44.45	1.750	50.01	1.969	-	-
550	22	559	22	41.28	1.625	47.63	1.875	53.98	2.125	-	-
600	24	610	24	46.02	1.812	52.37	2.062	59.54	2.344	-	-
650	26	660	26	-	-	-	-	-	-	-	-
700	28	711	28	-	-	-	-	-	-	-	-
750	30	762	30	-	-	-	-	-	-	-	-
800	32	813	32	-	-	-	-	-	-	-	-
850	34	864	34	-	-	-	-	-	-	-	-
900	36	914	36	-	-	-	-	-	-	-	-
950	38	965	38	-	-	-	-	-	-	-	-
1000	40	1016	40	-	-	-	-	-	-	-	-
1050	42	1067	42	-	-	-	-	-	-	-	-
1100	44	1118	44	-	-	-	-	-	-	-	-
1150	46	1168	46	-	-	-	-	-	-	-	-
1200	48	1219	48	-	-	-	-	-	-	-	-

Comparison Table - International Steel Specifications and Grades

ASTM				JIS		DIN
Fitting	Pipe	Plate	Forging	Pipe	Plate	Pipe
-	A53-F	-	-	SGP	SS41	2440/2441 ST33.2
-	A134/A139-B	-	-	STPY400		1625 ST37
-	A135-A	-	-	STPG38	SM41B	1626 ST37
-	A587	-	-	STPG38		1629 ST37
-	A106-A	A285-B	A105	STPT38	SB42	17175 ST35.8
WPB	A106-B	A515-65or70	A105	STPT42	SB42	17175 ST45.8
WPC	A106-C	-	-	STPT49	SB49	-
WPL6	A333/334-6	A515-60	A350-LF2	STPL39	-	-
WPL3	A333/334-3	A203-D	A350-LF3	STPL45	-	-
WP1	A335-P1	A204-B	A182-F1	STPA12	-	17175-15Mo3
WP12	A335-P12	A387-12	A182-F12	STPA22	-	17175-15Mo3
WP11	A335-P11	A387-11	A182-F11	STPA23	-	-
WP22	A335-P22	A387-22	A182-F22	STPA24	-	17175-10CrMo910
WP5	A335-P5	A387-5	A182-F5	STPA25	-	-
WP7	A335-P7	-	A182-F7	-	-	-
WP9	A335-P9	-	A182-F9	STPA26	-	-
WP304	A312-TP304	A240-304	A182-F304	SUS304TP	SUS304	17440-X5CrNi189
WP304H	A312-TP304H	A240-304H	A182-F304H	SUS304HTP	-	-
WP304L	A312-TP304L	A240-304L	A182-F304L	SUS304LTP	SUS304L	17440-X2CrNi189
WP309	A312-TP309	A240-309S	-	SUS309STP	SUS309S	-
WP310	A312-TP310	A240-310S	A182-F310	SUS310STP	SUS310S	-
WP347	A312-TP347	A240-347	A182-F347	SUS347TP	SUS347	17440-X5CrNiNb189
WP316	A312-TP316	A240-316	A182-F316	SUS316TP	SUS316	17440-X5CrNiMo1810
WP316H	A312-TP316H	A240-316H	A182-F316H	SUS316HTP	-	-
WP316L	A312-TP316L	A240-316L	A182-F316L	SUS316LTP	SUS316L	17440-X2CrNiMo1810
WP321	A312-TP321	A240-321	A182-F321	SUS321TP	SUS321	17440-X10CrNiTi189
WP321H	A312-TP321H	A240-321H	A182-F321H	SUS321HTP	-	-
WP347H	A312-TP347H	A240-347H	A182-F347H	SUS347HTP	-	-



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