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ASTM A269 TUBE DIMENSION



INTRODUCTION

What is ASTM A269 Tube?

The **ASTM A269 Tube** is a seamless steel tubing solution used mainly for both low and high temperature services. These tubes and pipes are manufactured using various processes like electric resistance welding, electric fusion welding, and also seamless cold drawing mechanism. The **ASTM A269 Stainless Steel Tube** comes with different surface finishes, which improves their aesthetics and gives it a protective coating, and they can be heat treated as well.

The **A269 Tubing** material is available in different grades and each of them has their own unique mechanical properties. For example, the 316 grade stainless steel of the given specification possesses more capability to resist corrosion compared to the 304 grade. Also, the **A269 Stainless Steel Tubing** solutions are available in different schedules and wall thicknesses which can be customized according to specific application requirements.

ASTM A269 Tubing working pressure

The allowable working pressure of **ASTM A269** material can be calculated from an S value of 137.8 MPa. For the **A269 Tubing** at -28 to 37 degrees C, the exact pressure depends on several factors such as the outer diameter of the tube, its wall thickness, its ordering number and also the weight. Clients can get the exact specification from the concerned manufacturer as they have a full list available.

Is ASTM A269 annealed?

Yes, the **ASTM A269 Tubing** solutions are bright annealed to remove its internal stress and increase its ductility. Depending on the specific grade of the **ASTM A269 Seamless Stainless Steel Tubing** solutions, they are annealed at specific temperatures. The process helps to soften the tube more than what is done by cold worked tubing.

SPECIFICATION

Specification	ASME A269/ ASME SA269
Standard	ASTM, JIS, EN, GB, DIN, AISI, SUS
Shapes	Hydraulic, Rectangular, Square, Round, Coiled, Honed Tubes, "U" Shape, Straight, Pan Cake Coils
Thickness Range	Schedule XXS, Schedule XXH, Schedule 5, Schedule 10, Schedule 40, Schedule 80S, Schedule XS, Schedule 160, Schedule 80
Delivery Condition	Polished, Bright Annealed (BA), Cold Drawn, Annealed and Pickled (AP), MF
Processing Service	Cutting, Welding, Bending, Punching, Decoiling, Moulding
Surface Finish	BA, No.1, 2B, No.8, 400G Satin/ Hairline, No.3, 500G, Mirror Polished, 600G or 800G Mirror finish Tubing, 8K, 2D, 1D, 180G, 320G, HL, No.4, 400G
END	Plain End, Bevelled End, Treaded
Manufacturing Type	Fabricated / CDW / Seamless / DOM / ERW / CDS / CEW / Welded / 100% X Ray Welded
Technique	Cold rolled, Hot rolled, Cold drawn, Extrusion
Packing	Ends Capped, Sleeved, Wooden Boxed

Nominal Pipe Size	Tolerance, %	
	+	-
3~18, t/D ≤ 5%	22.5	12.5
≥ 20, seamless, t/D ≤ 5%	22.5	12.5
1/8-2 1/2	20.0	12.5
3~18, t/D > 5%	15.0	12.5
≥ 20, seamless, t/D > 5%	15.0	12.5
≥ 20, welded	17.5	12.5

Weight Calculation Formula

- **Round shape:** $W = (OD - T) \times T \times 0.0031416 \times \text{Density}$
- **Rectangular shape:** $W = ((OD1 + OD2) \times 2 / 3.14 - T) \times T \times 0.0031416 \times \text{Density}$
- **Square shape:** $W = (OD \times 4 / 3.14 - T) \times T \times 0.0031416 \times \text{Density}$
- **Oval shape:** $W = ((OD \text{ of Oval} - T) \times T \times 0.0031416 \times \text{Density}$

WEIGHT CHART

Wall inches	Outside Diameter in inch	Inner Diameter in inch	Internal Area (in ²)	Tube Cross Sectional Area (in ²)
0.035	0.250	0.180	0.0254	0.0236
0.049	0.250	0.152	0.0181	0.0309
0.065	0.250	0.120	0.0113	0.0378
0.020	0.250	0.210	0.0346	0.0145
0.095	0.625	0.435	0.1486	0.1582
0.020	0.375	0.335	0.0881	0.0223
0.028	0.375	0.319	0.0799	0.0305
0.035	0.375	0.305	0.0731	0.0374
0.049	0.375	0.277	0.0603	0.0502
0.065	0.375	0.245	0.0471	0.0633
0.020	0.500	0.460	0.1662	0.0302
0.028	0.500	0.444	0.1548	0.0415
0.035	0.500	0.430	0.1452	0.0511
0.049	0.500	0.402	0.1269	0.0694
0.065	0.500	0.370	0.1075	0.0888
0.083	0.500	0.334	0.0876	0.1087
0.020	0.625	0.585	0.2688	0.0380
0.028	0.625	0.569	0.2543	0.0525
0.035	0.625	0.555	0.2419	0.0649
0.049	0.625	0.527	0.2181	0.0887
0.065	0.625	0.495	0.1924	0.1144
0.083	0.625	0.459	0.1655	0.1413
0.109	0.625	0.407	0.1301	0.1767
0.120	1.000	0.760	0.4536	0.3318
0.028	0.750	0.694	0.3783	0.0635
0.035	0.750	0.680	0.3632	0.0786
0.049	0.750	0.652	0.3339	0.1079
0.065	0.750	0.620	0.3019	0.1399
0.083	0.750	0.584	0.2679	0.1739
0.095	0.750	0.560	0.2463	0.1955
0.109	0.750	0.532	0.2223	0.2195
0.120	0.750	0.510	0.2043	0.2375
0.020	0.875	0.835	0.5476	0.0537
0.028	0.875	0.819	0.5268	0.0745
0.035	0.875	0.805	0.5090	0.0924
0.049	0.875	0.777	0.4742	0.1272
0.065	0.875	0.745	0.4359	0.1654
0.083	0.875	0.709	0.3948	0.2065

0.095	0.875	0.685	0.3685	0.2328
0.109	0.875	0.657	0.3390	0.2623
0.120	0.875	0.635	0.316L7	0.2846
0.028	1.000	0.944	0.6999	0.0855
0.035	1.000	0.930	0.6793	0.1061
0.049	1.000	0.902	0.6390	0.1464
0.065	1.000	0.870	0.5945	0.1909
0.028	0.250	0.194	0.0296	0.0195
0.083	1.000	0.834	0.5463	0.2391
0.095	1.000	0.810	0.5153	0.2701
0.109	1.000	0.782	0.4803	0.3051
0.134	1.000	0.732	0.4208	0.3646
0.035	1.250	1.180	1.0936	0.1336
0.049	1.250	1.152	1.0423	0.1849
0.065	1.250	1.120	0.9852	0.2420
0.083	1.250	1.084	0.9229	0.316L3
0.095	1.250	1.060	0.8825	0.3447
0.109	1.250	1.032	0.8365	0.3907
0.120	1.250	1.010	0.8012	0.4260
0.134	1.250	0.982	0.7574	0.4698
0.035	1.500	1.430	1.6061	0.1611
0.049	1.500	1.402	1.5438	0.2234
0.065	1.500	1.370	1.4741	0.2930
0.083	1.500	1.334	1.3977	0.3695
0.095	1.500	1.310	1.3478	0.4193
0.109	1.500	1.282	1.2908	0.4763
0.120	1.500	1.260	1.2469	0.5202
0.134	1.500	1.232	1.1921	0.5750
0.148	1.500	1.204	1.1385	0.6286
0.035	1.750	1.680	2.2167	0.1886
0.049	1.750	1.902	2.8413	0.3003
0.065	1.750	1.620	2.0612	0.3441
0.083	1.750	1.584	1.9706	0.4347
0.095	1.750	1.560	1.9113	0.4939
0.109	1.750	1.532	1.8433	0.5619
0.120	1.750	1.510	1.7908	0.6145
0.134	1.750	1.482	1.7250	0.6803
0.148	1.750	1.454	1.6604	0.7449
0.165	1.750	1.420	1.5837	0.8216
0.035	2.000	1.930	2.9255	0.2161
0.049	2.000	1.902	2.8413	0.3003

Chemical Composition

Grade	C	Ti	Mg	Ni	S	Mo	P	Cr	Si	N
TP304	0.08		2.00	8.0-11.0	0.030		0.045	18.0-20.0	1.00	
TP316	0.08		2.00	10.0-14.0	0.030	2.00-3.00	0.045	16.0-18.0	1.00	
TP304L	0.035		2.00	8.0-12.0	0.030		0.045	18.0-20.0	1.00	
TP316L	0.035 D		2.00	10.0-15.0	0.030	2.00-3.00	0.045	16.0-18.0	1.00	
TP321	0.08	5C - 0.70	2.00	9.0-12.0	0.030		0.045	17.0-19.0	1.00	
TP347	0.08		2.00	9.0-12.0	0.030		0.045	17.0-19.0	1.00	10C - 1.10

Mechanical properties

Grade	Heat treatment	Temperate F (C)	Hardness	
			Brinell	Rockwell
TP304	Solution	1900 (1040)	192HBW/ 200HV	90HRB
TP316	Solution	1900(1040)	192HBW/ 200HV	90HRB
TP304L	Solution	1900 (1040)	192HBW/ 200HV	90HRB
TP316L	Solution	1900(1040)	192HBW/ 200HV	90HRB
TP347	Solution	1900(1040)	192HBW/ 200HV	90HRB
TP321	Solution	1900(1040) F	192HBW/ 200HV	90HRB

EQUIVALENT

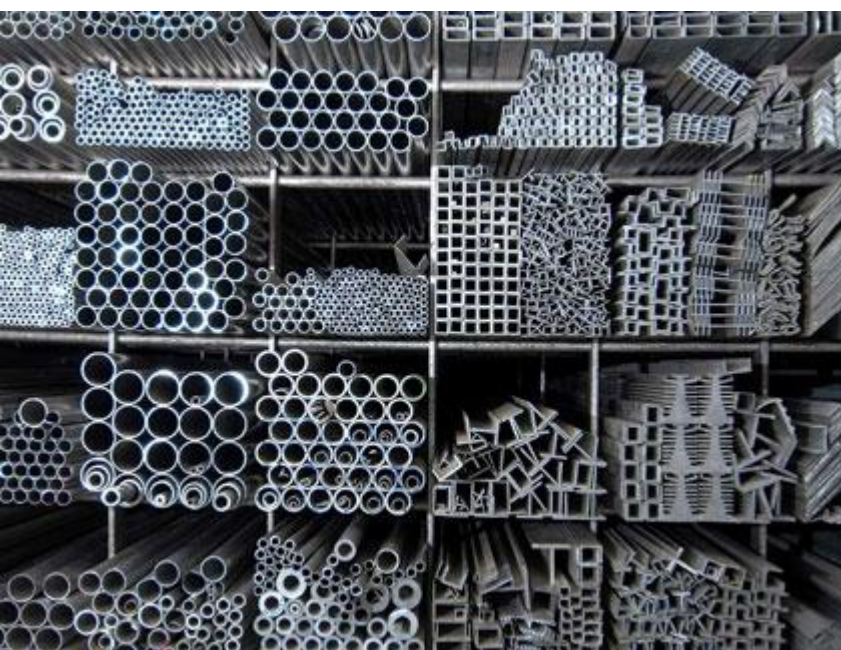
SAE grade	UNS	EN-standard Steel name	EN-standard
301LN		X2CrNiN18-7	1.4318
304L	S3043	X2CrNi18-9	1.4307
409	S40900	X6CrTi12	1.4512
312		X5CrNi30-9	
316	S31600	G-X 6 CrNiMo 18-10	1.4408
304L	S30403	X2CrNi19-11	1.4306
304LN	S30453	X2CrNiN18-10	1.4311
301	S30100	X10CrNi18-8	1.4310
310	S31000	X22CrNi2520	1.4841
304	S30400	X5CrNi18-10	1.4301
321H	S32109	X12CrNiTi18-9	1.4878
304H	S30409	X6CrNi18-11	1.4948
316LN	S31653	X2CrNiMoN17-12-2	1.4406
305	S30500	X5CrNi18-12	1.4303
310S	S31008	X 5 CrNi 2520	1.4845
321	S32100	X6CrNiTi18-10	1.4541
316	S31600	X3CrNiMo17-13-3	1.4436
2304	S32304	X2CrNi23-4	1.4362
316L	S31603	X2CrNiMo17-12-2	1.4404
316	S31600	X5CrNiMo17-12-2	1.4401
316L	S31603	X2CrNiMo17-12-3	1.4432
316LN	S31653	X2CrNiMoN17-13-3	1.4429
410	S41000		
316L	S31603	X2CrNiMo18-14-3	1.4435
316Ti	S31635	X6CrNiMoTi17-12-2	1.4571
	N08926	X1NiCrMoCuN25-20-7	1.4529
317L	S31703	X2CrNiMo18-15-4	1.4438
2205	S31803/S32205	X2CrNiMoN22-5-3	1.4462
J405	S32760	X2CrNiMoCuWN25-7-4	1.4501
904L	N08904	X1NiCrMoCu25-20-5	1.4539
254SMO	S31254	X1CrNiMoCuN20-18-7	1.4547

PRESSURE RATING

Wall Thickness in inch	Outer Diameter in inch	Working Pressure (PSI) 25% of Burst	Minimum Tensile Strength (PSI)	Theoretical Burst Pressure (PSI)	Minimum Yield Strength (PSI)	Collapse Pressure (PSI)	Theoretical Yield Point (PSI)
0.028	0.250	5,412	75,000	21,649	30,000	5,967	8,660
0.049	0.250	12,089	75,000	48,355	30,000	9,455	19,342
0.065	0.250	20,313	75,000	81,250	30,000	11,544	32,500
0.020	0.250	3,571	75,000	14,286	30,000	4,416	5,714
0.028	0.375	3,292	75,000	13,166	30,000	4,145	5,266
0.035	0.375	4,303	75,000	17,213	30,000	5,077	6,885
0.049	0.375	6,634	75,000	26,534	30,000	6,816	10,614
0.065	0.375	9,949	75,000	39,796	30,000	8,597	15,918
0.020	0.500	1,630	75,000	6,522	30,000	2,316L	2,609
0.028	0.500	2,365	75,000	9,459	30,000	3,172	3,784
0.035	0.500	3,052	75,000	12,209	30,000	3,906	4,884
0.049	0.500	4,571	75,000	18,284	30,000	5,316L	7,313
0.065	0.500	6,588	75,000	26,351	30,000	6,786	10,541
0.020	0.625	1,282	75,000	5,128	30,000	1,859	2,051
0.028	0.625	1,845	75,000	7,381	30,000	2,568	2,953
0.035	0.250	7,292	75,000	29,167	30,000	7,224	11,667
0.035	0.625	2,365	75,000	9,459	30,000	3,172	3,784
0.049	0.625	3,487	75,000	13,947	30,000	4,335	5,579
0.065	0.625	4,924	75,000	19,697	30,000	5,591	7,879
0.083	0.625	6,781	75,000	27,124	30,000	6,910	10,850
0.095	0.625	8,190	75,000	32,759	30,000	7,734	13,103
0.109	0.625	10,043	75,000	40,172	30,000	8,639	16,069
0.028	0.750	1,513	75,000	6,052	30,000	2,156	2,421
0.020	0.375	2,239	75,000	8,955	30,000	3,029	3,582
0.035	0.750	1,930	75,000	7,721	30,000	2,669	3,088
0.049	0.750	2,818	75,000	11,273	30,000	3,664	4,509
0.065	0.750	3,931	75,000	15,726	30,000	4,749	6,290
0.083	0.750	5,330	75,000	21,318	30,000	5,905	8,527
0.095	0.750	6,362	75,000	25,446	30,000	6,637	10,179
0.109	0.750	7,683	75,000	30,733	30,000	7,453	12,293
0.120	0.750	8,824	75,000	35,294	30,000	8,064	14,118
0.020	0.875	898	75,000	3,593	30,000	1,340	1,437
0.028	0.875	1,282	75,000	5,128	30,000	1,859	2,051
0.035	0.875	1,630	75,000	6,522	30,000	2,316L	2,609
0.049	0.875	2,365	75,000	9,459	30,000	3,172	3,784
0.065	0.875	3,272	75,000	13,087	30,000	4,126	5,235

0.095	0.875	5,201	75,000	20,803	30,000	5,807	8,321
0.109	0.875	6,221	75,000	24,886	30,000	6,543	9,954
0.120	0.875	7,087	75,000	28,346	30,000	7,100	11,339
0.028	1.000	1,112	75,000	4,449	30,000	1,633	1,780
0.083	0.500	9,319	75,000	37,275	30,000	8,307	14,910
0.035	1.000	1,411	75,000	5,645	30,000	2,027	2,258
0.049	1.000	2,037	75,000	8,149	30,000	2,796	3,259
0.065	1.000	2,802	75,000	11,207	30,000	3,647	4,483
0.083	1.000	3,732	75,000	14,928	30,000	4,567	5,971
0.095	1.000	4,398	75,000	17,593	30,000	5,159	7,037
0.109	1.000	5,227	75,000	20,908	30,000	5,827	8,363
0.120	1.000	5,921	75,000	23,684	30,000	6,336	9,474
0.134	1.000	6,865	75,000	27,459	30,000	6,963	10,984
0.035	1.250	1,112	75,000	4,449	30,000	1,633	1,780
0.049	1.250	1,595	75,000	6,380	30,000	2,260	2,552
0.065	1.250	2,176	75,000	8,705	30,000	2,958	3,482
0.083	1.250	2,871	75,000	11,485	30,000	3,719	4,594
0.095	1.250	3,361	75,000	13,443	30,000	4,213	5,377
0.109	1.250	3,961	75,000	15,843	30,000	4,776	6,337
0.083	0.875	4,390	75,000	17,560	30,000	5,152	7,024
0.120	1.250	4,455	75,000	17,822	30,000	5,207	7,129
0.134	1.250	5,117	75,000	20,468	30,000	5,742	8,187
0.035	1.500	918	75,000	3,671	30,000	1,367	1,469
0.065	1.500	1,779	75,000	7,117	30,000	2,487	2,847
0.083	1.500	2,333	75,000	9,333	30,000	3,136	3,733
0.095	1.500	2,719	75,000	10,878	30,000	3,559	4,351
0.109	1.500	3,188	75,000	12,754	30,000	4,043	5,101
0.165	1.750	4,357	75,000	17,430	30,000	5,124	6,972
0.134	1.500	4,079	75,000	16,315	30,000	4,881	6,526
0.148	1.500	4,610	75,000	18,439	30,000	5,336	7,375
0.035	1.750	781	75,000	3,125	30,000	1,176	1,250
0.049	1.750	966	75,000	3,864	30,000	1,434	1,546
0.065	1.750	1,505	75,000	6,019	30,000	2,146	2,407
0.083	1.750	1,965	75,000	7,860	30,000	2,711	3,144
0.095	1.750	2,284	75,000	9,135	30,000	3,080	3,654
0.109	1.750	2,668	75,000	10,672	30,000	3,504	4,269
0.120	1.750	2,980	75,000	11,921	30,000	3,832	4,768
0.134	1.750	3,391	75,000	13,563	30,000	4,242	5,425
0.148	1.750	3,817	75,000	15,268	30,000	4,645	6,107
0.035	2.000	680	75,000	2,720	30,000	1,032	1,088
0.120	1.500	3,571	75,000	14,286	30,000	4,416	5,714

0.049	2.000	966	75,000	3,864	30,000	1,434	1,546
0.049	1.500	1,311	75,000	5,243	30,000	1,896	2,097
0.065	2.000	1,303	75,000	5,214	30,000	1,887	2,086
0.083	2.000	1,697	75,000	6,788	30,000	2,387	2,715
0.095	2.000	1,968	75,000	7,873	30,000	2,715	3,149
0.109	2.000	2,294	75,000	9,175	30,000	3,092	3,670
0.120	2.000	2,557	75,000	10,227	30,000	3,384	4,091
0.134	2.000	2,901	75,000	11,605	30,000	3,751	4,642
0.148	2.000	3,257	75,000	13,028	30,000	4,111	5,211
0.165	2.000	3,705	75,000	14,820	30,000	4,542	5,928



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