

STAR™ Super Seal Key-Lock®

APPLICATIONS

- Potable Water
- Produced Water
- Waste Water
- Seawater
- Crude Oil & Gas
- Hydrogen & CO₂ Transport
- Brine
- Drainage Systems
- Sewage
- Brackish Water
- Pipe Rehabilitation
- General Industrial Service

PRODUCT DESCRIPTION

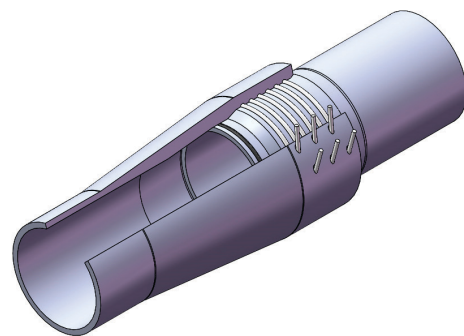
- **Sizes** - 8 through 40 inches (200-1000 mm)
- **Pressure** - 300 to 3,000 psi (2.1-20.7 MPa)
- **Temperature** - Anhydride - Up to 150°F (65°C)
Aromatic Amine - Up to 212°F (100°C)
- **Resin System** - Anhydride or Aromatic Amine
- **Reinforcement** - Premium Fiberglass
- **Joining Systems** - Filament wound glass-fiber reinforced epoxy (GRE) with integral Key-Lock (KL) male and female mechanical joining system.
- **Joint Length** - 39 ft. (11.9 m), 49 ft. (14.9 m)
or 60 ft. (18.3 m) nominal
- **Fittings** - Filament wound glass-fiber reinforced fittings with integral KL female bells. A wide range of fittings are available.

HIGH PRESSURE DESIGN

- **Design Life** - 20 years at full rating
- **Reinforced Wall Thickness** - Minimum
- **Hoop Stress** - 95% Lower Confidence Limit (LCL) of Long-Term Hydrostatic Strength (LTHS), ASTM D2992-B
- **Factory Hydro Test** - All sizes 1.5 times the series pressure rating

JOINING SYSTEM

- **Key-Lock** - A self-restrained joint offering a quick assembly by utilizing ductile locking keys for mechanical restraint. Joint is directly inserted with no rotation. Available with 1 or more locking keys depending on pressure requirements. Hydrostatic seal is made by means of an elastomeric O-ring.
- **Flanges** - Filament wound GRE stub flanges with integral KL male spigot ends are available. Flange hole patterns per ASME B16.5 and ASME B16.47 with either Class 300, 600, 900 or 1500 standard.



Super Seal Key-Lock

BENEFITS

- Corrosion Control
- Reduced Installation Costs
- Improved Flow Efficiency
- Reduced Paraffin & Scale Build-Up
- Reduced Maintenance Cost

STAR Super Seal Key-Lock - Specification Guide

Anhydride

8 Inch (200 mm) Diameter

8.22 inch (208.8 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	8.56	217	10.9	277	0.17	4.3	0.15	3.8	4.4	6.6	8600	38	2
750	750	51.7	8.71	221	11.2	285	0.25	6.3	0.23	5.8	6.8	10.1	13100	58	3
1000	1000	68.9	8.87	225	11.5	293	0.32	8.3	0.31	7.8	9.2	13.7	17800	79	3
1250	1250	86.2	9.03	229	12.0	306	0.40	10.3	0.39	9.8	11.7	17.4	22600	101	4
1500	1500	103.4	9.19	233	12.6	320	0.49	12.3	0.47	11.8	14.3	21.3	27700	123	4
1750	1750	120.7	9.36	238	13.1	334	0.57	14.5	0.55	14.0	17.0	25.3	32900	146	5
2000	2000	137.9	9.53	242	13.7	349	0.65	16.6	0.63	16.1	19.8	29.5	38400	171	6
2250	2250	155.1	9.70	246	14.4	365	0.74	18.8	0.72	18.3	22.7	33.8	44000	196	6
2500	2500	172.4	9.88	251	15.0	382	0.83	21.0	0.81	20.5	25.7	38.3	49900	222	7
2750	2750	189.6	10.05	255	15.7	399	0.92	23.3	0.90	22.8	28.9	43.0	55900	249	7
3000	3000	206.8	10.24	260	16.4	416	1.01	25.6	0.99	25.1	32.1	47.8	62300	277	8

10 Inch (250 mm) Diameter

10.35 inch (262.9 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	10.77	273	13.2	336	0.21	5.3	0.19	4.8	7.0	10.4	13600	60	2
750	750	51.7	10.96	278	13.6	347	0.31	7.8	0.29	7.3	10.7	15.9	20800	92	3
1000	1000	68.9	11.16	283	14.4	365	0.40	10.3	0.38	9.8	14.6	21.7	28200	125	4
1250	1250	86.2	11.36	289	14.8	376	0.50	12.8	0.48	12.3	18.5	27.6	35900	160	5
1500	1500	103.4	11.56	294	15.5	393	0.61	15.4	0.59	14.9	22.7	33.7	43900	195	5
1750	1750	120.7	11.77	299	16.2	411	0.71	18.1	0.69	17.6	27.0	40.1	52200	232	6
2000	2000	137.9	11.99	304	16.9	430	0.82	20.8	0.80	20.3	31.4	46.7	60800	271	7
2250	2250	155.1	12.20	310	17.7	451	0.93	23.5	0.91	23.0	36.0	53.6	69800	310	7
2500	2500	172.4	12.42	316	18.6	472	1.04	26.3	1.02	25.8	40.8	60.7	79000	352	8
2750	2750	189.6	12.65	321	19.4	494	1.15	29.2	1.13	28.7	45.8	68.1	88700	394	9
3000	3000	206.8	12.88	327	20.4	517	1.27	32.1	1.25	31.6	51.0	75.8	98700	439	10

12 Inch (300 mm) Diameter

12.35 inch (313.7 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	12.84	326	15.8	401	0.24	6.2	0.23	5.7	10.0	14.9	19300	86	2
750	750	51.7	13.07	332	16.3	413	0.36	9.2	0.34	8.7	15.3	22.7	29600	131	3
1000	1000	68.9	13.31	338	16.9	428	0.48	12.1	0.46	11.6	20.7	30.8	40100	179	4
1250	1250	86.2	13.55	344	17.6	448	0.60	15.2	0.58	14.7	26.4	39.3	51100	227	5
1500	1500	103.4	13.79	350	18.4	468	0.72	18.3	0.70	17.8	32.3	48.0	62500	278	5
1750	1750	120.7	14.04	357	19.3	490	0.85	21.5	0.83	21.0	38.4	57.1	74300	331	6
2000	2000	137.9	14.29	363	20.2	514	0.97	24.7	0.95	24.2	44.7	66.5	86600	385	6
2250	2250	155.1	14.55	370	21.2	537	1.10	28.0	1.08	27.5	51.3	76.3	99300	442	7
2500	2500	172.4	14.82	376	22.1	562	1.23	31.3	1.21	30.8	58.1	86.5	112500	501	8
2750	2750	189.6	15.09	383	23.2	589	1.37	34.8	1.35	34.3	65.2	97.0	126300	562	9
3000	3000	206.8	15.36	390	24.3	616	1.51	38.2	1.49	37.7	72.5	108.0	140500	625	10

STAR Super Seal Key-Lock - Specification Guide

Anhydride

14 Inch (350 mm) Diameter

13.56 inch (344.4 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	14.09	358	17.3	439	0.27	6.8	0.25	6.3	12.0	17.9	23300	104	2
600	600	41.4	14.19	361	17.5	444	0.32	8.1	0.30	7.6	14.6	21.7	28200	125	3
700	700	48.3	14.30	363	17.7	450	0.37	9.4	0.35	8.9	17.1	25.5	33100	147	3
800	800	55.2	14.40	366	17.9	455	0.42	10.7	0.40	10.2	19.7	29.3	38100	170	3
900	900	62.1	14.50	368	18.2	461	0.47	12.0	0.45	11.5	22.3	33.2	43200	192	4
1000	1000	68.9	14.61	371	18.4	467	0.52	13.3	0.50	12.8	25.0	37.2	48400	215	4
1100	1100	75.8	14.71	374	18.9	480	0.58	14.6	0.56	14.1	27.7	41.2	53600	239	5
1200	1200	82.7	14.82	376	19.1	486	0.63	16.0	0.61	15.5	30.4	45.3	58900	262	5
1300	1300	89.6	14.92	379	19.3	491	0.68	17.3	0.66	16.8	33.2	49.4	64300	286	5
1400	1400	96.5	15.03	382	19.9	505	0.74	18.7	0.72	18.2	36.0	53.6	69800	311	6
1500	1500	103.4	15.14	385	20.1	511	0.79	20.0	0.77	19.5	38.9	57.9	75400	335	6
1600	1600	110.3	15.25	387	20.7	526	0.84	21.4	0.82	20.9	41.8	62.2	81000	360	6
1700	1700	117.2	15.36	390	20.9	532	0.90	22.8	0.88	22.3	44.8	66.6	86700	386	6
1800	1800	124.1	15.47	393	21.2	538	0.95	24.2	0.93	23.7	47.8	71.1	92500	412	6
1900	1900	131.0	15.58	396	21.8	554	1.01	25.6	0.99	25.1	50.8	75.6	98400	438	7
2000	2000	137.9	15.69	399	22.0	560	1.07	27.1	1.05	26.6	53.9	80.2	104400	464	7
2100	2100	144.8	15.80	401	22.7	577	1.12	28.5	1.10	28.0	57.0	84.9	110500	491	8
2200	2200	151.7	15.92	404	23.0	584	1.18	29.9	1.16	29.4	60.2	89.6	116600	519	8
2300	2300	158.6	16.03	407	23.2	590	1.24	31.4	1.22	30.9	63.4	94.4	122900	547	8
2400	2400	165.5	16.15	410	23.9	608	1.29	32.9	1.27	32.4	66.7	99.3	129200	575	9
2500	2500	172.4	16.27	413	24.2	614	1.35	34.4	1.33	33.9	70.0	104.2	135700	604	9
2600	2600	179.3	16.38	416	24.9	633	1.41	35.8	1.39	35.3	73.4	109.3	142200	633	10
2700	2700	186.2	16.50	419	25.2	639	1.47	37.4	1.45	36.9	76.9	114.4	148900	662	10
2800	2800	193.1	16.62	422	25.4	646	1.53	38.9	1.51	38.4	80.3	119.6	155600	692	10

16 Inch (400 mm) Diameter

15.50 inch (393.7 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	16.10	409	19.5	496	0.30	7.7	0.28	7.2	15.7	23.4	30500	136	2
600	600	41.4	16.22	412	19.7	502	0.36	9.1	0.34	8.6	19.0	28.3	36800	164	3
700	700	48.3	16.34	415	20.0	508	0.42	10.6	0.40	10.1	22.4	33.3	43300	193	3
800	800	55.2	16.45	418	20.2	514	0.48	12.1	0.46	11.6	25.7	38.3	49800	222	3
900	900	62.1	16.57	421	20.5	521	0.54	13.6	0.52	13.1	29.2	43.4	56500	251	4
1000	1000	68.9	16.69	424	20.8	527	0.60	15.1	0.58	14.6	32.6	48.6	63200	281	4
1100	1100	75.8	16.81	427	21.4	543	0.66	16.6	0.64	16.1	36.2	53.8	70100	312	5
1200	1200	82.7	16.93	430	21.6	549	0.72	18.2	0.70	17.7	39.8	59.2	77000	343	5
1300	1300	89.6	17.05	433	21.9	555	0.78	19.7	0.76	19.2	43.4	64.6	84100	374	5
1400	1400	96.5	17.18	436	22.5	571	0.84	21.3	0.82	20.8	47.1	70.1	91200	406	6
1500	1500	103.4	17.30	439	22.7	578	0.90	22.8	0.88	22.3	50.8	75.7	98500	438	6
1600	1600	110.3	17.42	443	23.4	596	0.96	24.4	0.94	23.9	54.6	81.3	105800	471	7
1700	1700	117.2	17.55	446	23.7	602	1.02	26.0	1.00	25.5	58.5	87.1	113300	504	7
1800	1800	124.1	17.67	449	24.0	609	1.09	27.6	1.07	27.1	62.4	92.9	120900	538	7
1900	1900	131.0	17.80	452	24.7	627	1.15	29.2	1.13	28.7	66.4	98.8	128600	572	8
2000	2000	137.9	17.93	455	25.0	634	1.22	30.9	1.20	30.4	70.4	104.8	136400	607	8
2100	2100	144.8	18.06	459	25.7	654	1.28	32.5	1.26	32.0	74.5	110.9	144300	642	9
2200	2200	151.7	18.19	462	26.0	661	1.34	34.2	1.33	33.7	78.7	117.1	152400	678	9
2300	2300	158.6	18.32	465	26.3	668	1.41	35.8	1.39	35.3	82.9	123.4	160600	714	9
2400	2400	165.5	18.45	469	27.1	689	1.48	37.5	1.46	37.0	87.2	129.7	168900	751	10
2500	2500	172.4	18.59	472	27.4	696	1.54	39.2	1.52	38.7	91.5	136.2	177300	789	10

STAR Super Seal Key-Lock - Specification Guide

Anhydride

18 Inch (450 mm) Diameter

17.08 inch (433.8 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	17.74	451	21.3	542	0.33	8.4	0.31	7.9	19.1	28.4	37000	165	2
600	600	41.4	17.87	454	21.6	549	0.39	10.0	0.37	9.5	23.1	34.4	44700	199	3
700	700	48.3	18.00	457	21.9	555	0.46	11.7	0.44	11.2	27.1	40.4	52600	234	3
800	800	55.2	18.13	460	22.1	562	0.52	13.3	0.50	12.8	31.2	46.5	60500	269	3
900	900	62.1	18.26	464	22.7	576	0.59	14.9	0.57	14.4	35.4	52.7	68600	305	4
1000	1000	68.9	18.39	467	22.9	583	0.65	16.6	0.63	16.1	39.6	59.0	76800	342	4
1100	1100	75.8	18.52	470	23.6	600	0.72	18.3	0.70	17.8	43.9	65.4	85100	378	5
1200	1200	82.7	18.65	474	23.9	607	0.79	20.0	0.77	19.5	48.3	71.9	93500	416	5
1300	1300	89.6	18.79	477	24.2	614	0.85	21.7	0.83	21.2	52.7	78.4	102100	454	5
1400	1400	96.5	18.92	481	24.9	632	0.92	23.4	0.90	22.9	57.2	85.1	110800	493	6
1500	1500	103.4	19.06	484	25.2	639	0.99	25.1	0.97	24.6	61.7	91.9	119600	532	6
1600	1600	110.3	19.19	488	25.9	659	1.06	26.9	1.04	26.4	66.3	98.7	128500	572	6
1700	1700	117.2	19.33	491	26.2	666	1.13	28.6	1.11	28.1	71.0	105.7	137600	612	6
1800	1800	124.1	19.47	495	26.5	673	1.20	30.4	1.18	29.9	75.8	112.8	146800	653	6
1900	1900	131.0	19.61	498	27.3	694	1.27	32.2	1.25	31.7	80.6	120.0	156100	695	7
2000	2000	137.9	19.75	502	27.6	701	1.34	34.0	1.32	33.5	85.5	127.3	165600	737	7
2100	2100	144.8	19.90	505	28.5	723	1.41	35.8	1.39	35.3	90.5	134.7	175300	780	8
2200	2200	151.7	20.04	509	28.8	731	1.48	37.6	1.46	37.1	95.5	142.2	185000	823	8
2300	2300	158.6	20.18	513	29.1	739	1.55	39.4	1.53	38.9	100.7	149.8	195000	867	8
2300	2300	158.6	20.18	513	29.1	739	1.55	39.4	1.53	38.9	100.7	149.8	195000	867	8

20 Inch (500 mm) Diameter

18.98 inch (482.1 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	19.71	501	23.4	594	0.37	9.3	0.35	8.8	23.6	35.1	45700	203	3
600	600	41.4	19.85	504	23.7	602	0.44	11.1	0.42	10.6	28.5	42.4	55200	246	3
700	700	48.3	20.00	508	24.0	609	0.51	12.9	0.49	12.4	33.5	49.9	64900	289	3
800	800	55.2	20.14	512	24.3	616	0.58	14.7	0.56	14.2	38.6	57.4	74700	332	4
900	900	62.1	20.28	515	25.0	635	0.65	16.6	0.63	16.1	43.7	65.1	84700	377	4
1000	1000	68.9	20.43	519	25.3	642	0.72	18.4	0.70	17.9	49.0	72.8	94800	422	4
1100	1100	75.8	20.58	523	26.0	661	0.80	20.3	0.78	19.8	54.2	80.7	105100	467	5
1200	1200	82.7	20.72	526	26.3	668	0.87	22.1	0.85	21.6	59.6	88.7	115500	514	5
1300	1300	89.6	20.87	530	26.6	676	0.95	24.0	0.93	23.5	65.1	96.8	126000	561	5
1400	1400	96.5	21.02	534	27.4	697	1.02	25.9	1.00	25.4	70.6	105.1	136800	608	6
1500	1500	103.4	21.17	538	27.7	705	1.10	27.9	1.08	27.4	76.2	113.4	147600	657	6
1600	1600	110.3	21.33	542	28.6	727	1.17	29.8	1.15	29.3	81.9	121.9	158700	706	7
1700	1700	117.2	21.48	546	28.9	735	1.25	31.7	1.23	31.2	87.7	130.5	169900	756	7
1800	1800	124.1	21.63	550	29.2	743	1.33	33.7	1.31	33.2	93.6	139.3	181300	806	7
1900	1900	131.0	21.79	553	30.1	766	1.40	35.7	1.39	35.2	99.5	148.1	192800	858	8
2000	2000	137.9	21.95	557	30.5	774	1.48	37.7	1.46	37.2	105.6	157.1	204500	910	8

STAR Super Seal Key-Lock - Specification Guide

Anhydride

24 Inch (600 mm) Diameter

22.78 inch (578.6 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	23.65	601	27.7	704	0.43	11.0	0.42	10.5	34.0	50.6	65800	293	3
600	600	41.4	23.82	605	28.1	713	0.52	13.2	0.50	12.7	41.1	61.1	79600	354	4
700	700	48.3	23.99	609	28.4	721	0.61	15.4	0.59	14.9	48.3	71.8	93500	416	4
800	800	55.2	24.16	614	28.8	733	0.69	17.6	0.67	17.1	55.6	82.7	107700	479	4
900	900	62.1	24.34	618	29.6	752	0.78	19.8	0.76	19.3	63.0	93.7	122000	543	5
1000	1000	68.9	24.51	623	30.0	761	0.87	22.0	0.85	21.5	70.5	104.9	136600	608	5
1100	1100	75.8	24.69	627	30.9	784	0.95	24.2	0.93	23.7	78.1	116.3	151400	673	6
1200	1200	82.7	24.86	632	31.2	793	1.04	26.5	1.02	26.0	85.9	127.8	166400	740	6
1300	1300	89.6	25.04	636	31.6	802	1.13	28.7	1.11	28.2	93.7	139.5	181600	808	6
1400	1400	96.5	25.22	641	32.6	828	1.22	31.0	1.20	30.5	101.7	151.4	197000	876	7
1500	1500	103.4	25.40	645	32.9	837	1.31	33.3	1.29	32.8	109.8	163.4	212700	946	7

30 Inch (750 mm) Diameter

29.53 inch (750.1 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	30.65	778	35.4	900	0.56	14.2	0.54	13.7	57.1	85.0	110600	492	3
600	600	41.4	30.87	784	36.2	919	0.67	17.0	0.65	16.5	69.0	102.7	133700	595	4
700	700	48.3	31.09	790	36.6	930	0.78	19.8	0.76	19.3	81.1	120.7	157100	699	4
800	800	55.2	31.31	795	37.0	941	0.89	22.6	0.87	22.1	93.4	139.0	180900	805	5
900	900	62.1	31.54	801	38.2	970	1.00	25.5	0.98	25.0	105.9	157.5	205000	912	5
1000	1000	68.9	31.76	807	38.6	981	1.12	28.4	1.10	27.9	118.5	176.3	229500	1021	5
1100	1100	75.8	31.99	813	39.9	1012	1.23	31.2	1.21	30.7	131.3	195.4	254400	1131	6
1200	1200	82.7	32.22	818	40.3	1024	1.35	34.2	1.33	33.7	144.3	214.8	279600	1244	6
1300	1300	89.6	32.45	824	40.8	1036	1.46	37.1	1.44	36.6	157.5	234.4	305100	1357	6

36 Inch (900 mm) Diameter

35.43 inch (900.0 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	30.65	778	35.4	900	0.56	14.2	0.54	13.7	57.1	85.0	110600	492	3
500	500	34.5	36.76	934	41.9	1063	0.67	16.9	0.65	16.4	82.2	122.4	159300	708	3
600	600	41.4	37.03	941	43.2	1097	0.80	20.3	0.78	19.8	99.4	147.9	192500	856	4
700	700	48.3	37.29	947	43.7	1110	0.93	23.6	0.91	23.1	116.8	173.8	226200	1006	4
800	800	55.2	37.56	954	44.2	1123	1.06	27.0	1.04	26.5	134.5	200.1	260500	1159	4
900	900	62.1	37.83	961	45.6	1159	1.20	30.5	1.18	30.0	152.4	226.8	295200	1313	5
1000	1000	68.9	38.10	968	46.1	1172	1.34	33.9	1.32	33.4	170.6	253.9	330400	1470	5

40 Inch (1000 mm) Diameter

39.37 inch (1000 mm) Actual Inside Diameter

Series	Pressure Rating		Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys
	150 °F (65°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN	EA
	psi	bar													
500	500	34.5	40.85	1038	46.4	1178	0.74	18.7	0.72	18.2	101.5	151.1	196600	875	3
600	600	41.4	41.14	1045	47.7	1213	0.88	22.5	0.86	22.0	122.7	182.6	237700	1057	4
700	700	48.3	41.44	1053	48.3	1227	1.03	26.2	1.01	25.7	144.2	214.6	279400	1243	4

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Aromatic Amine

8 Inch (200 mm) Diameter

8.22 inch (208.8 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys	
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA
	psi	bar	psi	bar	psi	bar	psi	bar														
500	500	34.5	450	31.0	420	29.0	385	26.5	8.59	218	10.9	277	0.19	4.7	0.17	4.2	4.8	7.2	9600	43	2	
750	750	51.7	675	46.5	630	43.4	580	40.0	8.77	223	11.2	285	0.27	6.9	0.25	6.4	7.4	11.0	14700	65	3	
1000	1000	68.9	905	62.4	840	57.9	770	53.1	8.94	227	11.5	293	0.36	9.2	0.34	8.7	10.1	15.0	20000	89	3	
1250	1250	86.2	1130	77.9	1055	72.7	965	66.5	9.12	232	12.0	306	0.45	11.5	0.43	11.0	12.8	19.1	25500	113	4	
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	9.31	236	12.6	320	0.54	13.8	0.52	13.3	15.7	23.4	31200	139	4	
1750	1750	120.7	1580	108.9	1475	101.7	1350	93.1	9.49	241	13.1	334	0.64	16.2	0.62	15.7	18.7	27.8	37200	166	5	
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	9.68	246	13.7	349	0.73	18.6	0.71	18.1	21.8	32.5	43500	193	6	
2250	2250	155.1	2030	140.0	1895	130.7	1735	119.6	9.88	251	14.4	365	0.83	21.1	0.81	20.6	25.1	37.4	50000	222	6	
2500	2500	172.4	2255	155.5	2105	145.1	1930	133.1	10.08	256	15.0	382	0.93	23.6	0.91	23.1	28.5	42.4	56800	253	7	
2750	2750	189.6	2485	171.3	2315	159.6	2125	146.5	10.28	261	15.7	399	1.03	26.2	1.01	25.7	32.0	47.7	63900	284	7	
3000	3000	206.8	2710	186.8	2525	174.1	2315	159.6	10.49	267	16.4	416	1.14	28.9	1.12	28.4	35.7	53.2	71300	317	8	

10 Inch (250 mm) Diameter

10.35 inch (262.9 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys	
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA
	psi	bar	psi	bar	psi	bar	psi	bar														
500	500	34.5	450	31.0	420	29.0	385	26.5	10.81	275	13.2	336	0.23	5.8	0.21	5.3	7.7	11.4	15200	68	2	
750	750	51.7	675	46.5	630	43.4	580	40.0	11.03	280	13.6	347	0.34	8.6	0.32	8.1	11.7	17.4	23300	104	3	
1000	1000	68.9	905	62.4	840	57.9	770	53.1	11.25	286	14.4	365	0.45	11.4	0.43	10.9	15.9	23.7	31700	141	4	
1250	1250	86.2	1130	77.9	1055	72.7	965	66.5	11.48	291	14.8	376	0.56	14.3	0.54	13.8	20.3	30.3	40400	180	5	
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	11.71	297	15.5	393	0.68	17.2	0.66	16.7	24.9	37.1	49500	220	5	
1750	1750	120.7	1580	108.9	1475	101.7	1350	93.1	11.94	303	16.2	411	0.80	20.2	0.78	19.7	29.7	44.2	59000	263	6	
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	12.18	309	16.9	430	0.92	23.3	0.90	22.8	34.6	51.5	69000	307	7	
2250	2250	155.1	2030	140.0	1895	130.7	1735	119.6	12.43	316	17.7	451	1.04	26.4	1.02	25.9	39.8	59.2	79300	353	7	
2500	2500	172.4	2255	155.5	2105	145.1	1930	133.1	12.68	322	18.6	472	1.17	29.6	1.15	29.1	45.2	67.2	90000	401	8	
2750	2750	189.6	2485	171.3	2315	159.6	2125	146.5	12.94	329	19.4	494	1.29	32.9	1.27	32.4	50.8	75.6	101300	451	9	
3000	3000	206.8	2710	186.8	2525	174.1	2315	159.6	13.20	335	20.4	517	1.43	36.2	1.41	35.7	56.6	84.3	113000	503	10	

12 Inch (300 mm) Diameter

12.35 inch (313.7 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys	
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA
	psi	bar	psi	bar	psi	bar	psi	bar														
500	500	34.5	450	31.0	420	29.0	385	26.5	12.89	327	15.8	401	0.27	6.9	0.25	6.4	10.9	16.2	21600	96	2	
750	750	51.7	675	46.5	630	43.4	580	40.0	13.15	334	16.3	413	0.40	10.2	0.38	9.7	16.7	24.8	33100	147	3	
1000	1000	68.9	905	62.4	840	57.9	770	53.1	13.42	341	16.9	428	0.53	13.5	0.51	13.0	22.7	33.8	45100	201	4	
1250	1250	86.2	1130	77.9	1055	72.7	965	66.5	13.69	348	17.6	448	0.67	17.0	0.65	16.5	28.9	43.1	57600	256	5	
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	13.96	355	18.4	468	0.81	20.5	0.79	20.0	35.5	52.8	70500	314	5	
1750	1750	120.7	1580	108.9	1475	101.7	1350	93.1	14.24	362	19.3	490	0.95	24.0	0.93	23.5	42.2	62.9	84100	374	6	
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	14.53	369	20.2	514	1.09	27.7	1.07	27.2	49.3	73.4	98200	437	6	
2250	2250	155.1	2030	140.0	1895	130.7	1735	119.6	14.82	377	21.2	537	1.24	31.4	1.22	30.9	56.7	84.3	112900	502	7	
2500	2500	172.4	2255	155.5	2105	145.1	1930	133.1	15.12	384	22.1	562	1.39	35.2	1.37	34.7	64.3	95.7	128200	570	8	
2750	2750	189.6	2485	171.3	2315	159.6	2125	146.5	15.43	392	23.2	589	1.54	39.1	1.52	38.6	72.3	107.6	144200	641	9	
3000	3000	206.8	2710	186.8	2525	174.1	2315	159.6	15.75	400	24.3	616	1.70	43.1	1.68	42.6	80.6	120.0	160900	716	10	

STAR Super Seal Key-Lock - Specification Guide

Aromatic Amine

14 Inch (350 mm) Diameter

13.56 inch (344.4 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys	
	150 °F (65°C)		180 °F (82°C)		200 °F (93°C)		212 °F (100°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA
	psi	bar	psi	bar	psi	bar	psi	bar														
500	500	34.5	450	31.0	420	29.0	385	26.5	14.15	359	17.3	439	0.30	7.5	0.28	7.0	13.1	19.6	26100	116	2	
600	600	41.4	540	37.2	505	34.8	465	32.1	14.26	362	17.5	444	0.35	8.9	0.33	8.4	15.9	23.7	31600	140	3	
700	700	48.3	630	43.4	590	40.7	540	37.2	14.38	365	17.7	450	0.41	10.4	0.39	9.9	18.7	27.8	37100	165	3	
800	800	55.2	720	49.6	675	46.5	620	42.7	14.49	368	17.9	455	0.47	11.9	0.45	11.4	21.5	32.0	42800	190	3	
900	900	62.1	815	56.2	760	52.4	695	47.9	14.61	371	18.2	461	0.52	13.3	0.50	12.8	24.4	36.3	48500	216	4	
1000	1000	68.9	905	62.4	840	57.9	770	53.1	14.73	374	18.4	467	0.58	14.8	0.56	14.3	27.4	40.7	54400	242	4	
1100	1100	75.8	995	68.6	925	63.8	850	58.6	14.84	377	18.9	480	0.64	16.3	0.62	15.8	30.3	45.1	60300	268	5	
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	14.96	380	19.1	486	0.70	17.8	0.68	17.3	33.4	49.7	66300	295	5	
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	15.08	383	19.3	491	0.76	19.3	0.74	18.8	36.4	54.2	72500	322	5	
1400	1400	96.5	1265	87.2	1180	81.4	1080	74.5	15.20	386	19.9	505	0.82	20.9	0.80	20.4	39.6	58.9	78700	350	6	
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	15.32	389	20.1	511	0.88	22.4	0.86	21.9	42.8	63.6	85000	378	6	
1600	1600	110.3	1445	99.6	1345	92.7	1235	85.2	15.45	392	20.7	526	0.94	24.0	0.92	23.5	46.0	68.4	91500	407	6	
1700	1700	117.2	1535	105.8	1430	98.6	1310	90.3	15.57	396	20.9	532	1.01	25.5	0.99	25.0	49.3	73.3	98000	436	6	
1800	1800	124.1	1625	112.0	1515	104.5	1390	95.8	15.70	399	21.2	538	1.07	27.1	1.05	26.6	52.6	78.3	104700	466	6	
1900	1900	131.0	1715	118.2	1600	110.3	1465	101.0	15.82	402	21.8	554	1.13	28.7	1.11	28.2	56.0	83.3	111500	496	7	
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	15.95	405	22.0	560	1.19	30.4	1.18	29.9	59.4	88.5	118400	526	7	
2100	2100	144.8	1895	130.7	1770	122.0	1620	111.7	16.08	408	22.7	577	1.26	32.0	1.24	31.5	62.9	93.7	125400	558	8	
2200	2200	151.7	1985	136.9	1850	127.6	1700	117.2	16.21	412	23.0	584	1.32	33.6	1.30	33.1	66.5	99.0	132500	589	8	
2300	2300	158.6	2075	143.1	1935	133.4	1775	122.4	16.34	415	23.2	590	1.39	35.3	1.37	34.8	70.1	104.4	139700	621	8	
2400	2400	165.5	2165	149.3	2020	139.3	1855	127.9	16.47	418	23.9	608	1.45	37.0	1.44	36.5	73.8	109.8	147100	654	9	
2500	2500	172.4	2255	155.5	2105	145.1	1930	133.1	16.60	422	24.2	614	1.52	38.6	1.50	38.1	77.5	115.4	154600	688	9	
2600	2600	179.3	2350	162.0	2190	151.0	2005	138.2	16.74	425	24.9	633	1.59	40.3	1.57	39.8	81.4	121.1	162200	721	10	
2700	2700	186.2	2440	168.2	2275	156.9	2085	143.8	16.87	429	25.2	639	1.66	42.1	1.64	41.6	85.2	126.8	169900	756	10	
2800	2800	193.1	2530	174.4	2360	162.7	2160	148.9	17.01	432	25.4	646	1.72	43.8	1.70	43.3	89.2	132.7	177800	791	10	

16 Inch (400 mm) Diameter

15.50 inch (393.7 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter		Nominal Connection Diameter		Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys	
	150 °F (65°C)		180 °F (82°C)		200 °F (93°C)		212 °F (100°C)		in.	mm	in.	mm	in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA
	psi	bar	psi	bar	psi	bar	psi	bar														
500	500	34.5	450	31.0	420	29.0	385	26.5	16.17	411	19.5	496	0.34	8.5	0.32	8.0	17.2	25.5	34100	152	2	
600	600	41.4	540	37.2	505	34.8	465	32.1	16.30	414	19.7	502	0.40	10.2	0.38	9.7	20.8	30.9	41200	183	3	
700	700	48.3	630	43.4	590	40.7	540	37.2	16.43	417	20.0	508	0.46	11.8	0.45	11.3	24.4	36.3	48500	216	3	
800	800	55.2	720	49.6	675	46.5	620	42.7	16.56	421	20.2	514	0.53	13.5	0.51	13.0	28.1	41.9	55900	249	3	
900	900	62.1	815	56.2	760	52.4	695	47.9	16.69	424	20.5	521	0.60	15.2	0.58	14.7	31.9	47.5	63400	282	4	
1000	1000	68.9	905	62.4	840	57.9	770	53.1	16.83	427	20.8	527	0.66	16.9	0.64	16.4	35.7	53.2	71000	316	4	
1100	1100	75.8	995	68.6	925	63.8	850	58.6	16.96	431	21.4	543	0.73	18.6	0.71	18.1	39.6	59.0	78800	350	5	
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	17.10	434	21.6	549	0.80	20.3	0.78	19.8	43.6	64.9	86700	386	5	
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	17.23	438	21.9	555	0.87	22.0	0.85	21.5	47.6	70.9	94700	421	5	
1400	1400	96.5	1265	87.2	1180	81.4	1080	74.5	17.37	441	22.5	571	0.94	23.8	0.92	23.3	51.7	76.9	102800	457	6	
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	17.51	445	22.7	578	1.01	25.5	0.99	25.0	55.9	83.1	111100	494	6	
1600	1600	110.3	1445	99.6	1345	92.7	1235	85.2	17.65	448	23.4	596	1.08	27.3	1.06	26.8	60.1	89.4	119500	532	7	
1700	1700	117.2	1535	105.8	1430	98.6	1310	90.3	17.79	452	23.7	602	1.15	29.1	1.13	28.6	64.4	95.8	128100	570	7	
1800	1800	124.1	1625	112.0	1515	104.5	1390	95.8	17.94	456	24.0	609	1.22	30.9	1.20	30.4	68.7	102.3	136800	608	7	
1900	1900	131.0	1715	118.2	1600	110.3	1465	101.0	18.08	459	24.7	627	1.29	32.8	1.27	32.3	73.2	108.9	145600	648	8	
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	18.23	463	25.0	634	1.36	34.6	1.34	34.1	77.7	115.6	154600	688	8	
2100	2100	144.8	1895	130.7	1770	122.0	1620	111.7	18.37	467	25.7	654	1.44	36.5	1.42	36.0	82.2	122.4	163800	729	9	
2200	2200	151.7	1985	136.9	1850	127.6	1700	117.2	18.52	470	26.0	661	1.51	38.4	1.49	37.9	86.9	129.3	173100	770	9	
2300	2300	158.6	2075	143.1	1935	133.4	1775	122.4	18.67	474	26.3	668	1.58	40.3	1.57	39.8	91.6	136.4	182600	812	9	
2400	2400	165.5	2165	149.3	2020	139.3	1855	127.9	18.82	478	27.1	689	1.66	42.2	1.64	41.7	96.4	143.5	192200	855	10	
2500	2500	172.4	2255	155.5	2105	145.1	1930	133.1	18.97	482	27.4	696	1.74	44.1	1.72	43.6	101.3	150.8	202000	898	10	

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Aromatic Amine

18 Inch (450 mm) Diameter

17.08 inch (433.8 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150 °F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	17.81	452	21.3	542	0.37	9.3	0.35	8.8	20.8	31.0	41400	184	2
600	600	41.4	540	37.2	505	34.8	465	32.1	17.96	456	21.6	549	0.44	11.1	0.42	10.6	25.2	37.5	50100	223	3
700	700	48.3	630	43.4	590	40.7	540	37.2	18.10	460	21.9	555	0.51	13.0	0.49	12.5	29.7	44.1	58900	262	3
800	800	55.2	720	49.6	675	46.5	620	42.7	18.25	463	22.1	562	0.58	14.8	0.56	14.3	34.2	50.8	67900	302	3
900	900	62.1	815	56.2	760	52.4	695	47.9	18.39	467	22.7	576	0.66	16.6	0.64	16.1	38.7	57.7	77000	342	4
1000	1000	68.9	905	62.4	840	57.9	770	53.1	18.54	471	22.9	583	0.73	18.5	0.71	18.0	43.4	64.6	86200	384	4
1100	1100	75.8	995	68.6	925	63.8	850	58.6	18.69	475	23.6	600	0.80	20.4	0.78	19.9	48.1	71.6	95700	426	5
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	18.84	478	23.9	607	0.88	22.3	0.86	21.8	52.9	78.8	105200	468	5
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	18.99	482	24.2	614	0.95	24.2	0.93	23.7	57.8	86.0	115000	511	5
1400	1400	96.5	1265	87.2	1180	81.4	1080	74.5	19.14	486	24.9	632	1.03	26.2	1.01	25.7	62.8	93.4	124900	555	6
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	19.29	490	25.2	639	1.11	28.1	1.09	27.6	67.8	100.9	134900	600	6
1600	1600	110.3	1445	99.6	1345	92.7	1235	85.2	19.45	494	25.9	659	1.18	30.1	1.16	29.6	73.0	108.6	145100	646	6
1700	1700	117.2	1535	105.8	1430	98.6	1310	90.3	19.60	498	26.2	666	1.26	32.0	1.24	31.5	78.2	116.3	155500	692	6
1800	1800	124.1	1625	112.0	1515	104.5	1390	95.8	19.76	502	26.5	673	1.34	34.0	1.32	33.5	83.5	124.2	166100	739	6
1900	1900	131.0	1715	118.2	1600	110.3	1465	101.0	19.92	506	27.3	694	1.42	36.1	1.40	35.6	88.8	132.2	176800	787	7
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	20.08	510	27.6	701	1.50	38.1	1.48	37.6	94.3	140.3	187800	835	7
2100	2100	144.8	1895	130.7	1770	122.0	1620	111.7	20.24	514	28.5	723	1.58	40.2	1.56	39.7	99.9	148.6	198900	885	8
2200	2200	151.7	1985	136.9	1850	127.6	1700	117.2	20.40	518	28.8	731	1.66	42.2	1.64	41.7	105.5	157.0	210200	935	8
2300	2300	158.6	2075	143.1	1935	133.4	1775	122.4	20.57	522	29.1	739	1.74	44.3	1.72	43.8	111.3	165.6	221700	986	8

20 Inch (500 mm) Diameter

18.98 inch (482.1 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150 °F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	19.79	503	23.4	594	0.41	10.3	0.39	9.8	25.7	38.3	51100	227	3
600	600	41.4	540	37.2	505	34.8	465	32.1	19.95	507	23.7	602	0.48	12.3	0.47	11.8	31.1	46.3	61800	275	3
700	700	48.3	630	43.4	590	40.7	540	37.2	20.11	511	24.0	609	0.56	14.3	0.55	13.8	36.6	54.5	72700	324	3
800	800	55.2	720	49.6	675	46.5	620	42.7	20.27	515	24.3	616	0.65	16.4	0.63	15.9	42.2	62.8	83800	373	4
900	900	62.1	815	56.2	760	52.4	695	47.9	20.43	519	25.0	635	0.73	18.4	0.71	17.9	47.8	71.2	95100	423	4
1000	1000	68.9	905	62.4	840	57.9	770	53.1	20.60	523	25.3	642	0.81	20.5	0.79	20.0	53.6	79.8	106500	474	4
1100	1100	75.8	995	68.6	925	63.8	850	58.6	20.76	527	26.0	661	0.89	22.6	0.87	22.1	59.4	88.5	118100	526	5
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	20.93	532	26.3	668	0.97	24.7	0.95	24.2	65.4	97.3	130000	578	5
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	21.09	536	26.6	676	1.06	26.9	1.04	26.4	71.4	106.3	142000	632	5
1400	1400	96.5	1265	87.2	1180	81.4	1080	74.5	21.26	540	27.4	697	1.14	29.0	1.12	28.5	77.5	115.4	154200	686	6
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	21.43	544	27.7	705	1.23	31.2	1.21	30.7	83.8	124.6	166600	741	6
1600	1600	110.3	1445	99.6	1345	92.7	1235	85.2	21.61	549	28.6	727	1.31	33.4	1.29	32.9	90.1	134.1	179200	797	7
1700	1700	117.2	1535	105.8	1430	98.6	1310	90.3	21.78	553	28.9	735	1.40	35.6	1.38	35.1	96.5	143.6	192100	854	7
1800	1800	124.1	1625	112.0	1515	104.5	1390	95.8	21.95	558	29.2	743	1.49	37.8	1.47	37.3	103.1	153.4	205100	912	7
1900	1900	131.0	1715	118.2	1600	110.3	1465	101.0	22.13	562	30.1	766	1.58	40.0	1.56	39.5	109.7	163.3	218400	971	8
2000	2000	137.9	1805	124.5	1685	116.2	1545	106.5	22.31	567	30.5	774	1.66	42.3	1.64	41.8	116.5	173.3	231900	1031	8

STAR Super Seal Key-Lock - Specification Guide

Aromatic Amine

24 Inch (600 mm) Diameter

22.78 inch (578.6 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	23.75	603	27.7	704	0.48	12.3	0.46	11.8	37.1	55.2	73600	327	3
600	600	41.4	540	37.2	505	34.8	465	32.1	23.94	608	28.1	713	0.58	14.7	0.56	14.2	44.9	66.7	89100	396	4
700	700	48.3	630	43.4	590	40.7	540	37.2	24.13	613	28.4	721	0.67	17.1	0.65	16.6	52.7	78.5	104800	466	4
800	800	55.2	720	49.6	675	46.5	620	42.7	24.32	618	28.8	733	0.77	19.6	0.75	19.1	60.8	90.4	120700	537	4
900	900	62.1	815	56.2	760	52.4	695	47.9	24.52	623	29.6	752	0.87	22.0	0.85	21.5	68.9	102.6	136900	609	5
1000	1000	68.9	905	62.4	840	57.9	770	53.1	24.71	628	30.0	761	0.97	24.5	0.95	24.0	77.2	114.9	153400	682	5
1100	1100	75.8	995	68.6	925	63.8	850	58.6	24.91	633	30.9	784	1.06	27.0	1.05	26.5	85.6	127.4	170200	757	6
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	25.11	638	31.2	793	1.16	29.6	1.14	29.1	94.2	140.1	187200	833	6
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	25.31	643	31.6	802	1.27	32.1	1.25	31.6	102.9	153.1	204500	910	6
1400	1400	96.5	1265	87.2	1180	81.4	1080	74.5	25.51	648	32.6	828	1.37	34.7	1.35	34.2	111.7	166.2	222100	988	7
1500	1500	103.4	1355	93.4	1265	87.2	1160	80.0	25.72	653	32.9	837	1.47	37.3	1.45	36.8	120.7	179.6	240000	1068	7

30 Inch (750 mm) Diameter

29.53 inch (750.1 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	30.77	782	35.4	900	0.62	15.8	0.60	15.3	62.3	92.7	123700	550	3
600	600	41.4	540	37.2	505	34.8	465	32.1	31.02	788	36.2	919	0.74	18.9	0.72	18.4	75.4	112.2	149700	666	4
700	700	48.3	630	43.4	590	40.7	540	37.2	31.27	794	36.6	930	0.87	22.0	0.85	21.5	88.6	131.9	176100	783	4
800	800	55.2	720	49.6	675	46.5	620	42.7	31.52	801	37.0	941	0.99	25.2	0.97	24.7	102.1	152.0	202900	902	5
900	900	62.1	815	56.2	760	52.4	695	47.9	31.77	807	38.2	970	1.12	28.4	1.10	27.9	115.8	172.4	230100	1024	5
1000	1000	68.9	905	62.4	840	57.9	770	53.1	32.02	813	38.6	981	1.25	31.7	1.23	31.2	129.7	193.1	257800	1147	5
1100	1100	75.8	995	68.6	925	63.8	850	58.6	32.28	820	39.9	1012	1.37	34.9	1.35	34.4	143.9	214.1	286000	1272	6
1200	1200	82.7	1085	74.8	1010	69.6	925	63.8	32.54	826	40.3	1024	1.50	38.2	1.48	37.7	158.3	235.5	314600	1399	6
1300	1300	89.6	1175	81.0	1095	75.5	1005	69.3	32.80	833	40.8	1036	1.63	41.5	1.61	41.0	172.8	257.2	343700	1529	6

36 Inch (900 mm) Diameter

35.43 inch (900.0 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	36.91	938	41.9	1063	0.74	18.8	0.72	18.3	89.7	133.5	178100	792	3
600	600	41.4	540	37.2	505	34.8	465	32.1	37.21	945	43.2	1097	0.89	22.6	0.87	22.1	108.5	161.5	215500	959	4
700	700	48.3	630	43.4	590	40.7	540	37.2	37.51	953	43.7	1110	1.04	26.3	1.02	25.8	127.6	189.9	253500	1128	4
800	800	55.2	720	49.6	675	46.5	620	42.7	37.81	960	44.2	1123	1.19	30.2	1.17	29.7	147.0	218.8	292100	1299	4
900	900	62.1	815	56.2	760	52.4	695	47.9	38.11	968	45.6	1159	1.34	34.0	1.32	33.5	166.7	248.1	331300	1474	5
1000	1000	68.9	905	62.4	840	57.9	770	53.1	38.42	976	46.1	1172	1.49	37.9	1.47	37.4	186.8	278.0	371200	1651	5

40 Inch (1000 mm) Diameter

39.37 inch (1000 mm) Actual Inside Diameter

Series	Pressure Rating								Nominal Outside Diameter	Nominal Connection Diameter	Nominal Wall		Minimum Reinforced Wall		Pipe Weight		Short-Term Tensile Rating		Keys		
	150°F (65°C)		180°F (82°C)		200°F (93°C)		212°F (100°C)				in.	mm	in.	mm	lbs/ft	kg/m	lbs	kN		EA	
	psi	bar	psi	bar	psi	bar	psi	bar													
500	500	34.5	450	31.0	420	29.0	385	26.5	41.02	1042	46.4	1178	0.82	20.8	0.80	20.3	110.8	164.9	219900	978	3
600	600	41.4	540	37.2	505	34.8	465	32.1	41.34	1050	47.7	1213	0.98	25.0	0.97	24.5	134.0	199.4	266100	1184	4
700	700	48.3	630	43.4	590	40.7	540	37.2	41.67	1059	48.3	1227	1.15	29.2	1.13	28.7	157.6	234.5	313000	1392	4

STAR Super Seal Key-Lock - Specification Guide

Typical Mechanical Properties

Pipe Property		70°F	21°C	150°F	65°C	200°F	93°C	Method
		psi	MPa	psi	MPa	psi	MPa	
Hydrostatic Design Basis (Aromatic Amine)	(LTHS)	18,700 ⁽¹⁾	129 ⁽¹⁾	18,700	129	17,500	121	ASTM D2992, Proc. B (20 yrs)
	(LCL)	18,000 ⁽¹⁾	124 ⁽¹⁾	18,000	124	15,800	109	
Hydrostatic Design Basis (Anhydride)	(LTHS)	23,800 ⁽¹⁾	164 ⁽¹⁾	23,800	164			ASTM D2992, Proc. B (20 yrs)
	(LCL)	21,400 ⁽¹⁾	148 ⁽¹⁾	21,400	148			
Ultimate Hoop Stress at Weeping		36,000	248	45,400	313	48,400	334	ASTM D1599

Circumferential

Hoop Tensile Modulus	3.87 x 10 ⁶	26,500	2.91 x 10 ⁶	19,700	2.31 x 10 ⁶	15,500	NOV FGS
Poisson's Ratio ν_{ha}	0.61		0.72		0.79		NOV FGS

Longitudinal

Axial tensile strength	8,700	60	9,000	62	9,200	63.4	ASTM D2105
Axial Modulus	2.24 x 10 ⁶	15,500	1.62 x 10 ⁶	11,200	1.27 x 10 ⁶	8,550	ASTM D2105
Poisson's Ratio ν_{ah}	0.35		0.40		0.43		ASTM D2105
Axial Bending Strength	8,700	60	-	-	-	-	NOV FGS
Axial Bending Modulus	2.24 x 10 ⁶	15,500	1.75 x 10 ⁶	12,100	1.43 x 10 ⁶	9,900	ASTM D2925
Shear Modulus	1.76 x 10 ⁶	12,100	1.65 x 10 ⁶	11,400	1.58 x 10 ⁶	10,900	NOV FGS

⁽¹⁾ Value obtained at 150°F (65°C)

Typical Physical Properties

Pipe Property	Value	Value	Method
Thermal Conductivity	0.19 BTU/hr·ft·°F	0.33 W/m·°C	NOV FGS
Thermal Expansion - Axial	12.0 x 10 ⁻⁶ in/in·°F	21.6 x 10 ⁻⁶ mm/mm·°C	ASTM D696
Flow Coefficient, Hazen Williams		150	-
Absolute Roughness	1.7 x 10 ⁻⁵ ft	5.3 x 10 ⁻⁶ m	-
Density	121 lbs/ft ³	1940 kg/m ³	ASTM D792
Specific Gravity		1.95	ASTM D792
Specific Heat	0.22 BTU/lb·°F	910 J/kg·°C	-

Fiber Glass Systems

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