

What is the pressure rating of sanitary tube and fittings? It Depends.....

We are asked on a regular basis what is the pressure rating on the sanitary tubing and fittings we supply. It is a fairly simple question with a complex answer. In a nutshell, it depends. We will explain.

First off, none of the sanitary tube manufacturers publish working or burst pressure ratings for their products. They will point you to either Barlow's Formula or ASME B31.3a and let you do the math to determine the theoretical burst pressure. Also, no sanitary fittings manufacturer publishes pressure ratings for their fittings, most of which are derived from sanitary tubing.

In a practical sense, the burst or working pressure of sanitary tube is really not germane to the sanitary process world because we rarely see process pressures that even approach levels where these limits would come into play. The theoretical burst pressure of 1" sanitary tube is over 10,000psi, for 4" it is over 2,800psi. 95% of sanitary process applications are below 200psi. What does matter is the pressure rating of the sanitary unions in the system.

While more and more sanitary process lines are mostly welded together, virtually all of them have sanitary unions in them. They are used to connect sanitary pumps, valves, instrumentation, vessels. Etc. All of these use sanitary clamps that do have pressure ratings. Sanitary clamp manufacturers usually rate the working pressures at both 70°F and 250°F. Let's take a look at the major types of unions.



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Tri-Clamp Fittings

Also known as S Clamp, Kwik Clamp and simply clamp fittings, Tri-Clamp sanitary fittings are easily the most popular type of sanitary union system used in process applications. They offer the greatest variety of clamps available. The most popular are the two piece camp with the wing nut and the high pressure two piece bolt together clamp. Listed below is the data VNE supplies for their sanitary clamps. Rated below are three common styles are clamp: two-piece with wing nut, two-piece with hinges and a wing nut and the two piece bolt together style.

	Temp	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
2 Piece with Wingnut	70°F	1500	500	500	450	400	350	200
	250°F	1200	250	250	250	200	150	125
2 Piece Hinged with Wingnut	70°F		500	500	450	400	350	200
	250°F		250	250	250	200	150	125
2 Piece Bolt Together	70°F	1500	1500	1500	1000	1000	1000	1000
	250°F	1200	1200	1200	800	800	800	800

These ratings are fairly representative for what is thought of as the standard cast clamps on the market. If you have applications that require higher pressure ratings L.J. Star offers a line of more precision made investment cast clamps. They offer an ASME clamp that is rated 2480psi at 100°F for a 1 1/2" and 1015psi for a 4" clamp.

I Line Fittings

Sanitary I Line fittings, also labeled the E Line fitting by VNE, was originally developed by Waukesha for higher pressure applications and their pressure rating reflect this. They are rated the same regardless of the clamp used. Waukesha's I line clamp ratings are:

Temp	1"	1 1/2"	2"	2 1/2"	3"	4"
70°F	1220	1220	900	720	600	570
250°F	1100	1100	830	660	550	525

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Q Line Fittings

This is another fitting style developed by Waukesha, often thought of as a heavy duty Tri-Clamp fitting. They offer both heavy duty and light duty clamp. Waukesha rates these:

	Temp	1"	1 1/2"	2"	2 1/2"	3"	4"
Heavy Duty 13I, 13IU,13IS	70°F	1120	1220	900	720	600	570
	250°F	1100	1100	830	660	550	525
Light Duty 13QT	70°F	150	150	150	150	150	100
	250°F	125	125	125	125	125	75

Bevel Seat Fittings

These are the ancient mariners of sanitary fittings. We have not seen anyone put a pressure rating on them. Given that these are a metal to metal seated fitting designed for daily disassembly and cleaning, we would not recommend these in any type of higher pressure applications.

Hopefully this post gives some clarity to the pressure ratings of sanitary tube and fittings. In a nutshell, if you want to know the pressure limitations on your sanitary process line, start by looking at the weakest link, the clamps. If you have one of those rare sanitary process lines that has no clamps in it, look at the pumps and valves. If you have just sanitary tubing and fittings, use Barlow's Formula. Have fun. As always, if you have any questions regarding the pressure ratings on sanitary fittings and tube or any other dilemmas regarding sanitary process equipment, don't hesitate to contact us at Tri-Canada today.