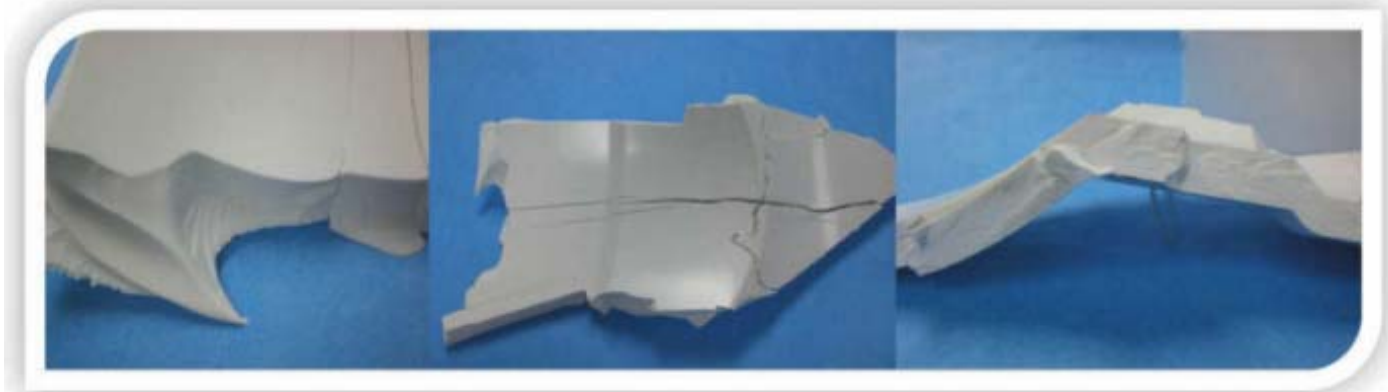


How much pressure can PVC fittings stand?



This question is frequently asked, and although the answer is elementary, the reasoning needs more explanation. The simple answer is: “Schedule 40 and Schedule 80 fittings **DO NOT** have a pressure rating.” Although the fittings have a wall thickness that is 25% heavier than the equal schedule and diameter pipe there are other elements that can affect their pressure bearing ability.

The ability of a cylinder, or pipe, to withstand internal pressure is easily defined by simple mathematics and verifiable by testing. The pressure ratings of thermoplastic pipe, not fittings, are the maximum allowable operating pressure within a piping system for water at 73° Fahrenheit. (23.4 degrees Celsius) based upon a service factor of 0.5. Pipe pressure ratings have to be reduced when the working fluid is other than water at 73° Fahrenheit.

Still, a pressure rating for the fittings, with their diversity of configuration patterns and sizes are outside the ability to install. The variances created by the injection molding process, tool design, and individual geometries reduce the ability to get a pressure rating.

Over the history of many billions of fittings produced and installed, the industry has shown a criterion which calls for a fitting to incorporate a greater wall thickness than equal size pipe. Leading to a life cycle evaluation where the fittings parallel the pressure rating of the same diameter and schedule pipe. Yet, studies show that when the working pressure exceeds the pressure rating of the piping, the number of cycles before failure decreases rapidly. Even if the pressure fluctuations inside a piping system do not

exceed the rating of the pipe, the geometries of fittings produce stresses unseen in a cylinder or pipe. These extra stresses tend to produce cyclic failures.

Second, many installers believe Schedule 80 systems are stronger because they deliver higher pressure ratings than Schedule 40 systems. This is true only when comparing systems with components that have been solvent welded. The introduction of even one PVC threaded pipe connection or nipple, and the rating of that part must be cut by 50%, which may affect the pressure rating of the rest of the system.

The table below shows the pressure rating of Schedule 40 and Schedule 80 PVC pipe, but not fittings. Observe how, the right-hand column reflects how the Schedule 80 pipe pressure rating has been cut by the initiation of threads. Always the threaded part lowers the pressure rating below the equal size Schedule 40 pipe.

Nominal Size	Schedule 40	Schedule 80	Threaded Schedule 80
1/2	600	850	425
3/4	480	690	345
1	450	630	320
1-1/4	370	520	260
1-1/2	330	470	240
2	280	400	200
2-1/2	300	420	210
3	260	370	190
4	220	320	160
5	190	290	140
6	180	280	140
8	160	250	120
10	140	230	120
12	130	230	110