**Hydoforming of Tube to Tubesheet Joints**

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Since the early 1900's mechanical tube expansion using 3 pins and a Morris tapered mandrels have been the industry standard. This tool connected to a drill motor will expand the tube using mechanical forces. Wall reduction, Work Hardening, Stress Corrosion Cracking are some of the problems mechanical expansion and needing better quality tube to tubesheet joints.

Hydroforming was invented in the mid 70's by Haskel Int. Inc. for Aircraft tube into fittings. This technology was soon adapted for the pressure vessel industry. Using a Mandrel with O'rings set at a predetermined expansion zone. The tube between the O'rings is put under pressure from 1500Psi. to 70'000 psi which then expands the tube creating a sealed joint. With little to no work hardening, .2% wall reduction, and very small amounts of stress placed on the tube it is the best tube to tubesheet joint available today. Hydroforming has been performed on every imaginable tube material and size.

My Poster will show pictures of both expansion tools, Heat exchanger tubesheets, cross sections of Mechanical and Hydroformed tube joints, Will reference papers written on the two methods, Expansion formulas. Pro's and Con's of each process.

The purpose of my poster is to allow people to form an opinion on which process is better. By laying out all the facts and being fair to both processes, hopefully they can make an educated decision.