Constant Surface Wave Thread

The concept of a constant surface thread is that it maintains the same surface and circumference area across the thread as the shank diameter. This is a Van Cor Thread with similar applications, but it does allow two unique tubular applications. Either pressed into a malleable material such as a pipe or as a clamp between a flexible tube. The concept of the constant surface minimizes stretching the material.

Malleable materials such as aluminum and steel can have this thread press into their tubes. An example is the metal stove pipe. Normally these are pushed together with a straight ribbed nipple and bell design that easily comes apart. The constant surface wave thread will add a tensile structural component that holds these pipes requiring less support. This would reduce the need of pipe clamps such as automotive exhaust.

Flexible materials such as a hose would have the male and female threaded components clamped onto the end. The tube would follow the contour of the shape without stretching. It would channel the tensile load into the clamp across the thread in a way that distributes stress.

Figures 1 and 2 below show an even crimping of a tube to form a nipple. Note the nipple is smaller then the outside diameter.

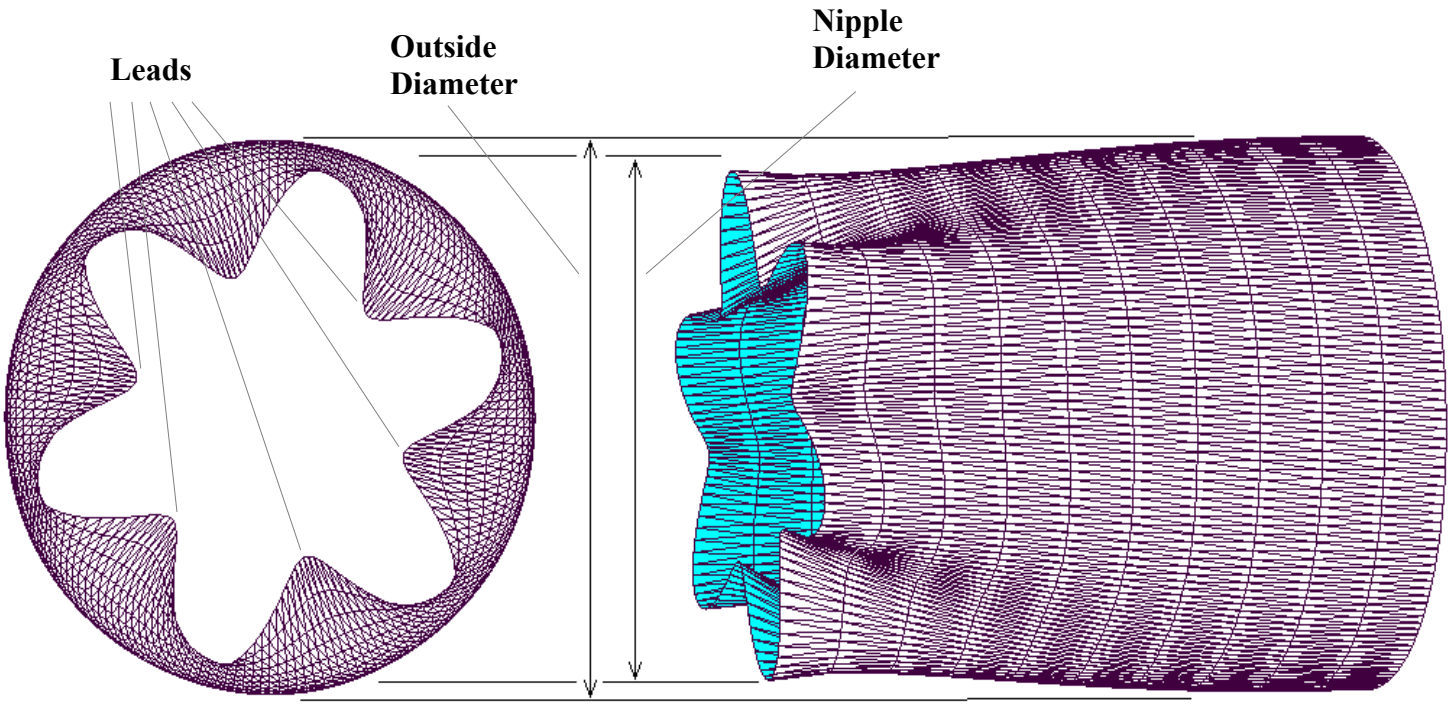

Fig. 1 End view of nipple and outside diameter

Fig. 2 Side view across the nipple length.

Figure 3, 4 and 5 shows the same tube in Figs. 1 and 2 with its layers rotated to form a wave thread. This wave thread has a constant period; the equivalent to a constant pitch width on standard threads. The deeper the amplitude or height, the smaller the diameter.

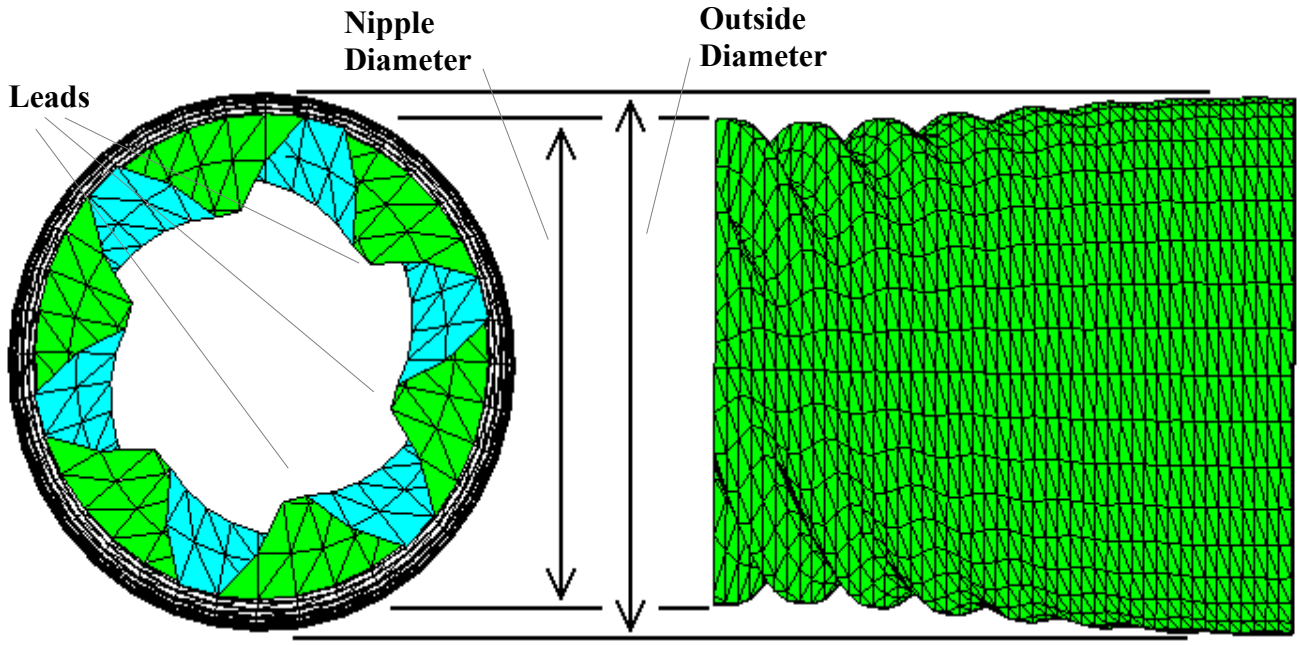

Fig. 3 End view of rotated layers

Fig. 4 Side view of rotated layers

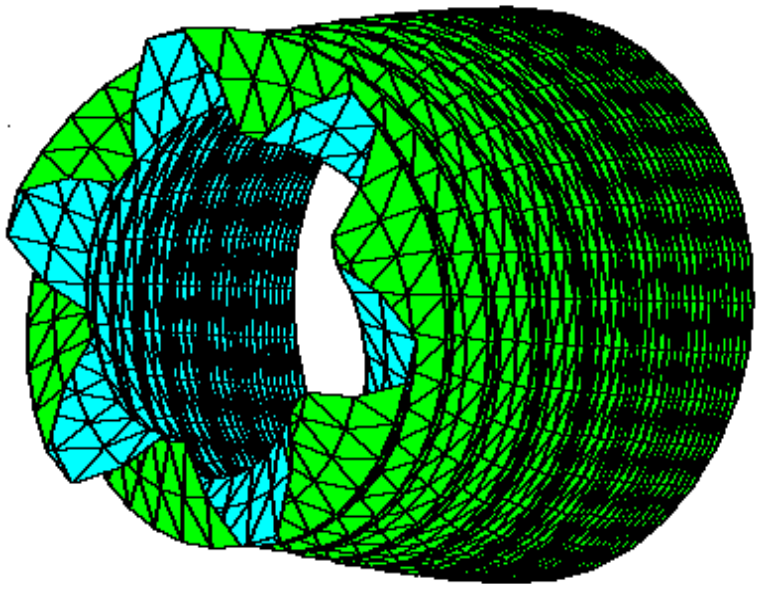

Fig. 5 Angled view of rotated layers forming a wave thread

Schedule 40 PVC pipe at a specific diameter could be heated and molded into a male end. The other end heated and molded into a smaller receiving female thread. These threads are not identical because of the thickness of the pipe. They are made to match their contact surfaces. The male thread has to have a deeper thread to accommodate the outer width of Schedule 40 pipe. The female thread will be accommodating the inner width of the pipe to mate with the male thread. The heating and

molding components for plastic would be a type of kit that Home Depot could sell.

Figs. 6 and 7 are a cross-section view of constant surface clamp connection. This type of clamp requires an inside male nipple and an outside threaded female collar components. First the threaded collar is screwed down the tube. The one shown is a dual wave meaning half the wave is part of the clamp and the other half a form the tube follows as it transitions back to a round shape. The second step is to thread the nipple onto the end also shown in Fig. 6. Last the threaded collar is screwed back on to the nipple creating the clamp with the tube between them shown in Fig. 7.

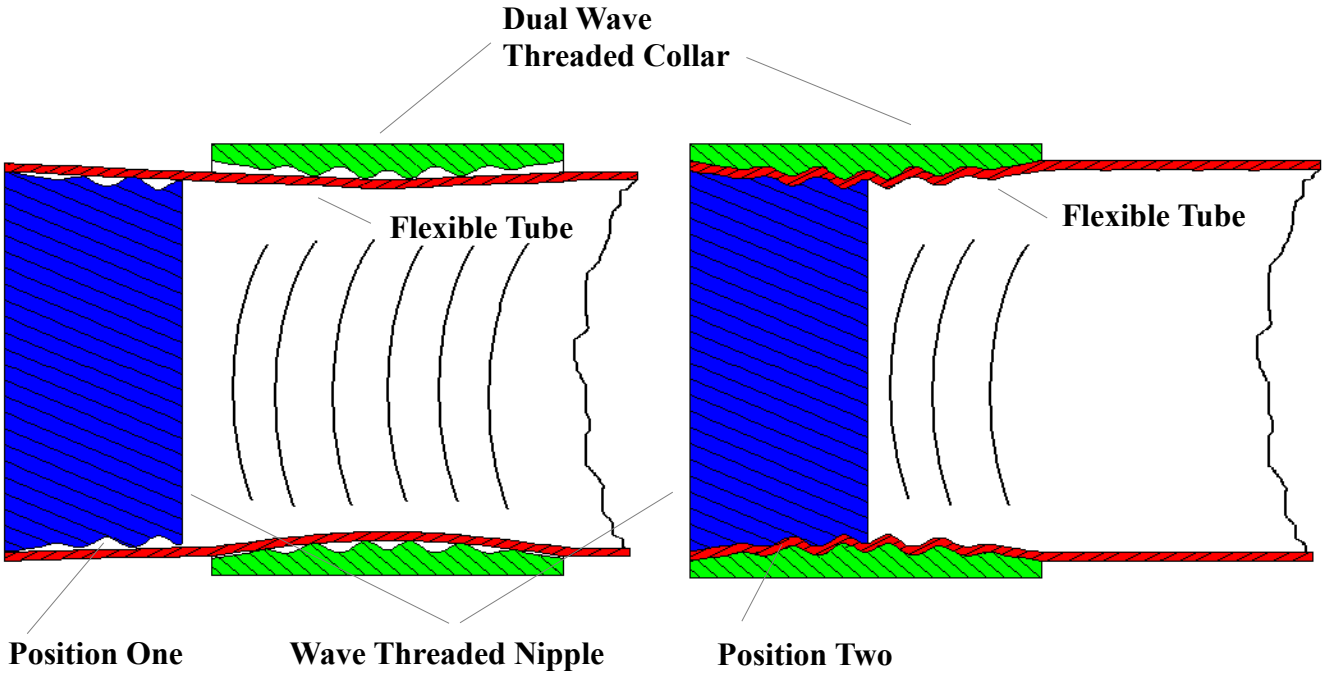

Fig. 6 Flexible Tube with collar and nipple screwed on

Fig. 7 Flexible Tube fully clamped

This type of tube clamping could be designed for hose, hydraulic or pneumatic connections, fire hose, gas, or components that attached to woven material like tents, backyard pools or forms.

The purpose of constant surface is to allow an even distribution of stress across a flexible material. Other clamping methods stretch and compress their tube creating weaknesses leading to failure. The constant surface was developed to not create weaknesses and be more durable.