



Enhancing Pipe Support Reliability with Belleville Washers

INDUSTRY CHALLENGES

Pipe supports are crucial for maintaining structural integrity and thermal performance in [LNG](#), [cryogenics](#), and power generation applications. [LNG](#) facilities experience extreme temperature fluctuations, requiring robust support systems to manage thermal expansion. The same could be said of elevated temperature piping. As piping length and diameter changes, it is important to maintain stresses within acceptable boundaries to prevent failure.

SOLUTION

In these demanding environments, [Solon's Belleville Washers](#) play a pivotal role. They are used in [cryogenic](#) and elevated temperature pipe supports to maintain clamping force during extreme thermal fluctuations. The supports are often clamped to the pipe with bolts at a specified preload. There is often insulation between the clamp and the piping as well. It is critical that the clamping stresses be maintained as temperature changes. If load is too low, the piping will not be secured. If loading is too high, the pipe may be subject to excessive stresses. Since the rate of the studs used in clamping is very high, this can be problematic. As the pipe dimensions change, the loads change very quickly. [Stacks](#) of Belleville washers are used to greatly reduce the change in force due to these effects. By [stacking](#) and configuring [Solon's Belleville Washers](#), we fine-tune the applied force, delivering stability and consistent performance.

Since space in any given assembly is limited, it is critical that the [stack design](#) be optimized. This means that the required performance is delivered using the least number of springs possible in any stack. Solon Engineers work with multiple OEMs to improve their [stack design](#). This saves assembly time, space requirements, and overall cost. In one recent case, Solon was able to reduce the number of springs needed by 60% while improving performance. This is not unusual.

What truly sets [Solon's Belleville Washers](#) apart in [Cryogenic](#) Pipe Supports is their ability to sustain preload under fluctuating temperatures and mechanical strain. This minimizes the risk of loosening or [relaxation](#) over time. Their precise force management enhances system reliability, an essential factor in high-stakes environments like [LNG](#), where even minor support failures can have significant operational consequences.



Cryogenic Pipe Support with Stacked Belleville Washers



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