

Wake Frequency Analysis – Disclaimer & Exclusions

Disclaimer

These calculations are for estimation/indication purposes only and are based on the ASME PTC 19.3 TW-2016 Thermowells Standard specifically for single piece metallic bar stock stems within certain geometry, fabrication, and finishing limitations. Aircom does not guarantee the performance of a specific thermowell design obtained from the use of these calculations.

Engineering judgment is required to interpret the results of these calculations, and certain authorities require the authentication and validation of the calculations before putting a thermowell into service. It is up to the system designer to provide all relevant information to perform adequate thermowell analyses for all conditions the thermowell fitting will experience.

This third-party software has a limited temperature range for the material properties and picks the closest temperature value for material properties, use caution when selecting a design temperature. The material properties are from the ASME BPVC Section II-D-2007. The software may not perform all required checks to meet the requirements of the ASME PTC 19.3 TW-2016 standard.

Included in the Scope

These calculations only address forces on the stem/shank caused by:

1. Stem external hydrostatic pressure.
2. Fluid impingement on the stem:
 - a. Stem static (steady state) forces.
 - b. Stem dynamic (oscillating) forces.
3. Vortex shedding frequency on the stem.

Excluded from the Scope

The following items are not part of the scope of these calculations.

- Pressure/Temperature Ratings (Aircom addresses these with CRN registration calculations):
 - ASME B31.3 Material Properties.
 - ASME B31.1 Material Properties.
 - ASME BPVC Section VIII, Division 1.
 - ASME B16.5 Pipe Flanges.
 - ASME B1.20.1 Pipe Threads.
 - ASME B16.11 Socket-Welding Fittings.
- Configurations:
 - Arrays/banks of thermowells.
 - Compound welded stems and/or welded caps.
 - Quills/probes for sampling/injection.
 - Pipe/tube thermowells and protection tubes (e.g., ceramics, silicon carbides, etc.).
 - Helical strakes for suppression of vortices.
 - Overlays for protection against erosion/abrasion and/or corrosion.
 - Dimensional Limits:

Range	Unsupported Length (U)	Bore Diameter (ID)	Root/Tip Diameter (OD)	Wall Thickness (t)
Minimum:	6.35 mm (2.5") Stepped 127.0 mm (5")	3.175 mm (0.125")	9.2 mm (0.36")	3.0 mm (0.12")
Maximum:	609.5 mm (24")	20.955 mm (0.825")	46.5 mm (1.83")	...