

IMPROVE THERMOWELL ENGINEERING AND SELECTION WHILE AVOIDING POTENTIAL FAILURES

Honeywell's SmartLine® AVT with Wake Frequency Calculator enables informed decisions about thermowell selection, construction, and installation.



Honeywell

THE RIGHT TOOL FOR DEMANDING PROCESS APPLICATIONS

Honeywell has added another key feature to its best-in-class SmartLine® Application and Validation Tool (AVT) – the Wake Frequency Calculator (WFC) – which helps users make the right thermowell selection based on their process application.

CHECK HONEYWELL THERMOWELL COMPATIBILITY

as per ASME PTC 19.3 TW-2016

Company Name

Tag ID

Reference #

PROCESS CONDITIONS

* Fluid

* Fluid State

* Max Operating Temperature (T) °C

* Max Operating Pressure (P) MPa

Gauge



Reference Diagram (Click)

Honeywell's Wake Frequency Calculator is an advanced, user-friendly tool based on the ASME PTC TW-2016 standard providing mathematical proof of thermowell strength with respect to static and dynamic stress in relation to operating temperature, pressure and flow velocity.

Thermowell wakes, and the resulting thermowell wake frequency, is a physical characteristic resulting from the interaction of a thermowell with the fluid flowing past it. In some applications, the wake frequency can result in the design of the thermowell being unsuitable for the application and use of such a thermowell being a potential safety hazard.

Applicable Thermowells

- Machined from bar stock
- Straight, tapered, or step-down shank
- Threaded, flanged, or welded process connections

Non-Applicable Thermowells

- Thermowells manufactured from pipe
- Thermowells fabricated with welds at any place along the length of the shank or at the tip
- Thermowells with specially designed surface structures (e.g., a knurled surface or a surface with spiral ridges)
- Thermowells with overlay over the shank (e.g., sleeves or coatings)

FORCES IMPACTING THERMOWELL PERFORMANCE

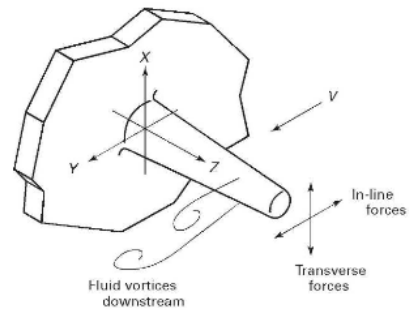
Process fluid conditions will form a wake, known as a “Von Karman Trail,” which has a specific frequency representing a function of the diameter of the thermowell and the fluid velocity.

The ASME PTC TW-2016 standard describes the forces caused by external pressure and the combination of steady and dynamic forces resulting from the fluid stream.

Thermowell wake frequency calculations should be conducted during thermowell specification, prior to thermowell manufacture. These calculations ensure that the thermowell design is robust enough to cope with the forces produced by the process media.

The forces impacting thermowell performance include flow-induced stress and oscillating lift and drag forces produced by the shedding of vortices.

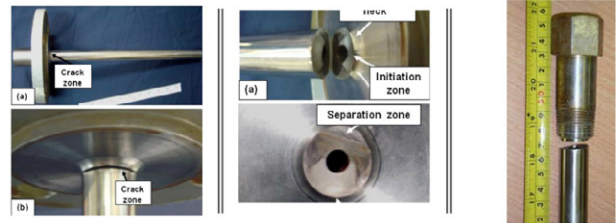
Flow-induced thermowell stress



Oscillating lift and drag forces



Examples of Typical Failure Scenarios



Examples of Thermowell Failure

WHY USE HONEYWELL'S ADVANCED THERMOWELL WFC?



Today, the paradigm for selecting and deploying process instrumentation is changing. Industrial organizations can utilize a new breed of productivity tools to take the user experience to a new level throughout the lifecycle of installed assets, starting from product selection through commissioning.

Honeywell's cloud-based Application and Validation Tool (AVT) assists in selecting the right technology and configuring the right instruments so the factory can ship a pre-engineered product for an out-of-box, trouble-free experience.

For failed Wake Frequency Calculations, the AVT's WFC tool offers basic recommended thermowell failure resolutions. Users can make an informed decision on a possible resolution or utilize a combination of approaches based on their specific application. Possible failure resolutions include:

- Reducing thermowell immersion length ("U" Length)
- Increasing thermowell shank diameter
- Relocating thermowell installation to an area with less velocity

CHOOSING THE RIGHT TEMPERATURE PROBE ASSEMBLY

Honeywell offers installation-ready temperature measurement assemblies that include SmartLine temperature transmitters, temperature elements, and thermowell configurations. The availability of a single, easy-to-order assembly eliminates the need for multiple ordering sources, compatibility checks, and field wiring.

SmartLine temperature probe assemblies ensure superior performance, enhanced reliability and safety, and minimized cost of ownership.

They feature:

- Factory assembly calibration for enhanced system performance
- Agency-approved integration for plant and personnel safety, and streamlined regulatory compliance
- Pre-assembly from the factory for out-of-the-box installation
- Factory testing for functional integrity



BENEFITS FOR INDUSTRIAL OPERATIONS

Unlike most manufacturers, Honeywell provides open access to its WFC tool to help users perform Wake Frequency Calculations during early engineering stages – independent of the thermowell supplier – so they can make informed engineering decisions upfront related to thermowell construction and installation.

In field instrumentation projects, one of the main sources of delay is ordering thermowells, which is due to finalizing Wake Frequency Calculations. The WFC tool helps reduce iterations between Honeywell and the EPC and OEM by up to 50%, thereby improving the overall lead time.

Such activities usually occur after order placement with the supplier, resulting in changes or compromises around thermowell design, installation location, and material of construction. This situation can lead to delayed deliveries and may impact process start-up.

WFC users can reduce engineering rework by ensuring the correct selection of thermowells before ordering, further avoiding potential changes on site that can prove cumbersome and costly.

Discover SmartLine Here

For more information

visit process.honeywell.com or contact your Honeywell Account Manager.

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FUTURE
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WHAT
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MAKE IT**

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