



# VortexWell



[www.okazaki-mfg.com](http://www.okazaki-mfg.com)



**OKAZAKI**  
MANUFACTURING COMPANY

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We focus on solving your challenges –  
ensuring you experience outstanding performance and safety.

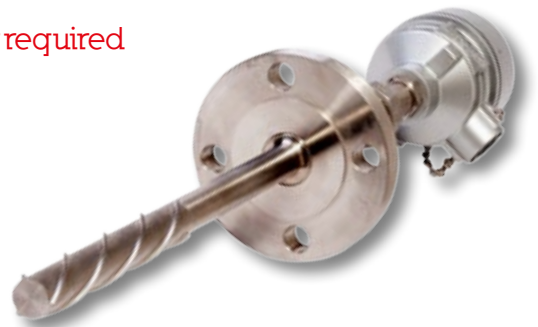


## The VortexWell Thermowell Since 1999

When it comes to market-leading temperature measurement, we lead the way. Through our meticulous development of our VortexWell, you can be assured of unrivalled quality performance and safety.

At Okazaki, our focus is on solving your problems. Through the use of cutting-edge technology our engineers have developed a complex solution to your Thermowell resonance failure issues. Simple and effective, incorporating:

- Helical strake design
- Stable pressure field
- No velocity collar required



### Customers:

ExxonMobil



INEOS



ارامكو السعودية  
Saudi Aramco



## A great solution: Okazaki VortexWell

We're fully aware of the issues that the industry has faced for a number of years with regards to vortex induced resonance failures. Which is why we assure you of our absolute commitment to extensive research and development in this area. No longer is simple reliance on an engineered product that often results in costly and extensive assessment and calculation an option. You want more from us, which is why we deliver a sound, vastly technically advanced solution.

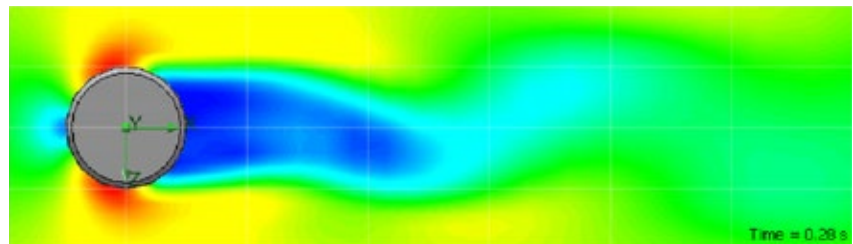


## Technically advanced

Fluid flowing around a blunt object in its path forms vortices downstream of the object – commonly known as vortex shedding (Von Karman Vortex Street) and we fully recognise the implications that this can have.

As the Vortex shedding frequency or Strouhal Frequency, approaches the Thermowell natural frequency, you'll find that the tip displacement and stresses are greatly magnified and the Thermowell can fail. Even when the Thermowell has passed calculation to the ASME PTC 19.3 TW-2010, we're aware that failures can happen.

Have a look at the image from this independent report by Cygnet Development Systems – showing the velocity plot of the flowrates around a standard Thermowell with the formation and shedding of vortices clearly identifiable.

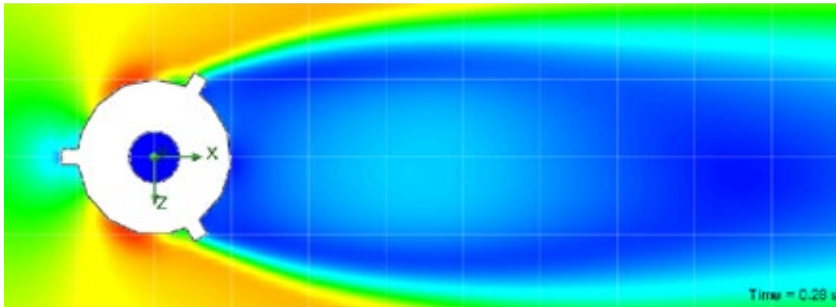


## Okazaki VortexWell finding alternative solutions

Our constant focus at Okazaki is on innovation – making sure that we bring you the most technically advanced solutions to deal with the challenges that you face. For this reason we've looked at alternative ways to deal with the issues that vortex induced vibration causes. Following extensive research, we sought to bring you a solution that tackles the original cause of the problem, as opposed to just masking the symptoms. Bringing you an effective device that solves the issues you face.

### Continuing to bringing you innovation

In our endeavour to bring you the best performing solution, we looked at several different ideas: increasing damping, avoiding resonance, using a streamline cross section, and adding a vortex suppression device. We found that incorporating a helical strake as a vortex suppression method would provide you, our valued clients with the best performing and safest Thermowell solution available.



Have a look at the image from the same independent report by Cygnet Development Systems – showing the velocity plot of the flowrates around an Okazaki Vortexwell Thermowell which clearly demonstrates that the design greatly reduces vortex induction.

### Key benefits:

- No more vortex induced vibration
- Flow disturbance is minimised thanks to its aerodynamic tip

## VortexWell: Your results-driven solution

In choosing the VortexWell solution, you can be guaranteed that you're making a sound business choice that will give you the desired results. You can be reassured that you'll benefit from world-class performance and the highest standards of safety. Vortex induced vibration will be greatly reduced thanks to the helical strake design which incorporates the strake height, pitch, form and width. All carefully calculated and machined to ensure the highest standards of performance.

Following an independent report carried out by Cygnet Development Systems Ltd, it was discovered that regular vortex shredding was eliminated, enabling the VortexWell to operate at high flow with the required U Length. The report also identified that Wake Frequency never reached the natural frequency of the VortexWell so lock-in was also avoided.



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