Helical strake type thermowell

Model : A650 series

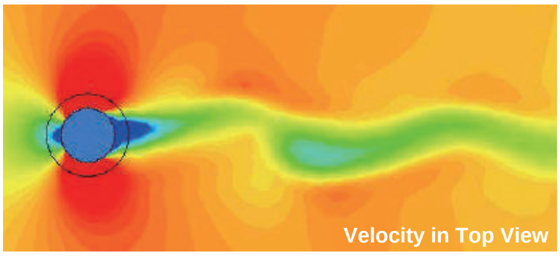
Spec. sheet no. AD06-06

Service intended

Thermowell is manufactured and calculated according to ASME PTC 19.3 TW-2016 to protect it from the loads of the flux. If the calculated value is not appropriate,
then shorten the length of the Thermowell, and increase the root and the tip diameter of the Thermowell to change the outcome value, or try to change the structure by installing the support collar on the Thermowell.
However, these changes have its own limits.
A650 Series could reduce the amplitude of oscillation by 70 %, and reduce the danger of breakage of Thermowell by VIV (Vortex Induced Vibration).
Furthermore, because it reduces the loads on the Thermowell, it makes the installation possible without installing the support collar and without the change of Nozzle.

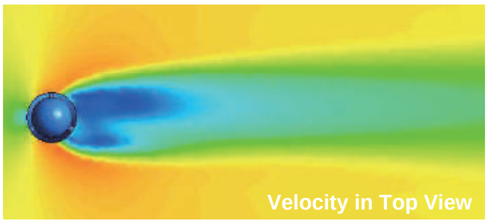
Description

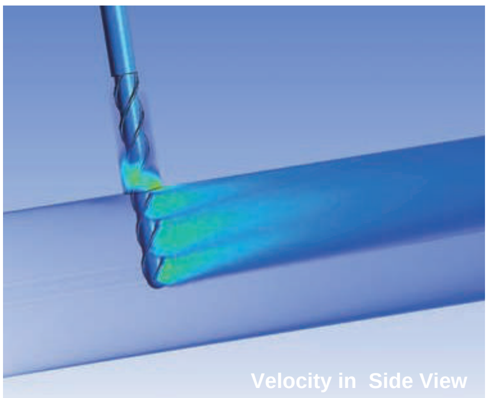
Standard type thermowell



The oscillation of vortices which is caused by VIV can be found around the Thermowell. If the vortex shedding frequency approaches to the natural frequency, then the resonance could cause the breakage of the Thermowell.

A6500 type thermowell





By comparing the standard Thermowell with A650 Series, the noticeable decrease of the vortices could be found around the A650 Series. Furthermore, it could reduce the chance of breakage of the Thermowell which is caused by VIV.

WISE®

1. Base model

A6510	Flanged Type Thermowell
A6520	Vanstone Type Thermowell
A6530	Socket Type Thermowell

2. Material of well

BX	304SS
CX	316SS
DX	304L SS
EX	316L SS
FX	310SS
ZX	Others

3. Material of flanged

BX	304SS
CX	316SS
DX	304L SS
EX	316L SS
FX	310SS
ZX	Others

4. Internal connection

0	½" NPT
1	½" PT
2	½" PF

5. Tip outer diameter / Bore size (mm)

E0	20 / 7	**E1**	20 / 9

6. Flange size

C	1" (25A)	**G**	2½" (65A)
D	1¼" (32A)	**H**	3" (80A)
E	1½" (40A)	**I**	4" (100A)
F	2" (50A)	**Z**	Other

7. Process connection type

DA	PN10 RF	**AW**	900Lb RTJ
DB	PN16 RF	**AT**	1,500Lb RF
AE	150Lb FF	**AX**	1,500Lb RTJ
AC	150Lb RF	**AU**	2,500Lb RF
AD	150Lb RFSF	**AY**	2,500Lb RTJ
AH	300Lb FF	**KN**	10K FF
AF	300Lb RF	**KL**	10K RF
AG	300Lb RFSF	**KM**	10K RFSF
DI	PN25 RF	**KR**	20K FF
AJ	600Lb RF	**KP**	20K RF
AK	600Lb RFSF	**KQ**	20K RFSF
AV	600Lb RTJ	**DO**	PN40 RF
AS	900Lb RF	**ZZ**	Other

8. Insertion length ("U") length (mm)

3	200	**B**	600
4	250	**C**	700
5	300	**D**	800
6	350	**E**	900
7	400	**F**	1,000
8	450	**Z**	Other
A	500		

Note : Please choose a code of next higher length
if applicable length is not.
Actual length shall be specified.

9. "T" length (mm)

0	45
1	50 below
2	50 above

Note : Actual length shall be specified.

10. Option

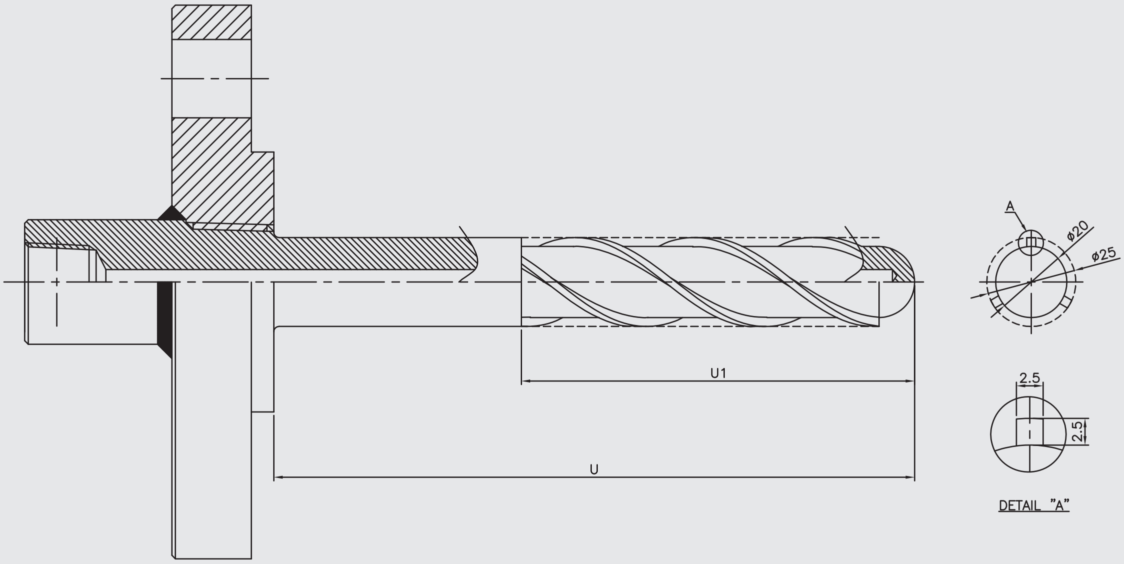
0	None
1	Plug and chain (304SS)
2	Plug and chain (316SS)
8	F.P welding (Only flanged type)

Note : Actual length shall be specified.

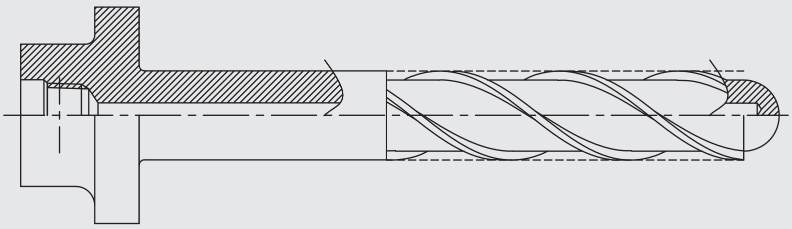
Sample ordering code

1	2	3	4	5	6	7	8	9	10
A6510	**BX**	**BX**	**0**	**E0**	**C**	**DA**	**3**	**0**	**1**

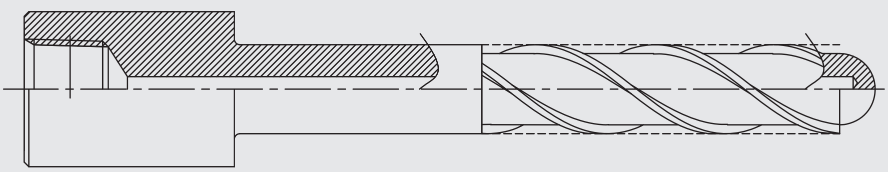
Standard product drawing



FLANGED TYPE



VANSTONE TYPE



SOCKET WELDED TYPE

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FLOW MEASUREMENT WITH A HELICAL STRAKE TYPE THERMOWELL IN FLOW MEASUREMENT STANDARD SYSTEMS

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ABSTRACT

Helical strake type thermowells are replacing standard thermowells according to ASME PTC 19.3 TW-2016 in various industrial sectors. It is because the helical strakes can suppress the flow-induced vibration by Kármán vortex street over a thermowell. However, the ASME PTC 19.3 TW-2016 does not regulate the helical strakes because their design rules are too complicated to be specified.

This study attempts to characterize the effect of helical strakes on the thermowell vibrations by measuring pressure and strain signals at the same time. The pressure signal is expected to give information on the Kármán vortex street while the strain signal gives the flow-induced vibration on the thermowells. Relative vibration energy or relative vibration amplitude is defined to calculate the efficiency of suppressing the Kármán vortex street around the thermowells.

Keywords: Flow induced vibration, Helical strake, Thermowell.

FIGURE 1: FLOW STANDARDS (LEFT: GAS FLOW, RIGHT: WATER FLOW)

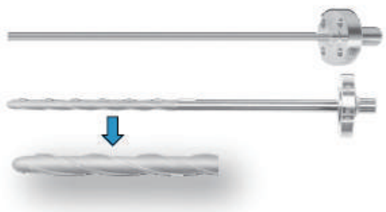

FIGURE 2: THERMOWELLS (TOP: STANDARD, BOTTOM: HELICAL STRAKE TYPE)

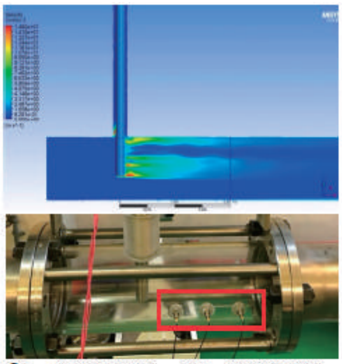

FIGURE 3: LOCATION OF DYNAMIC PRESSURE TRANSDUCER (TOP: NUMERICAL SIMULATION, BOTTOM: EXPERIMENT)

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