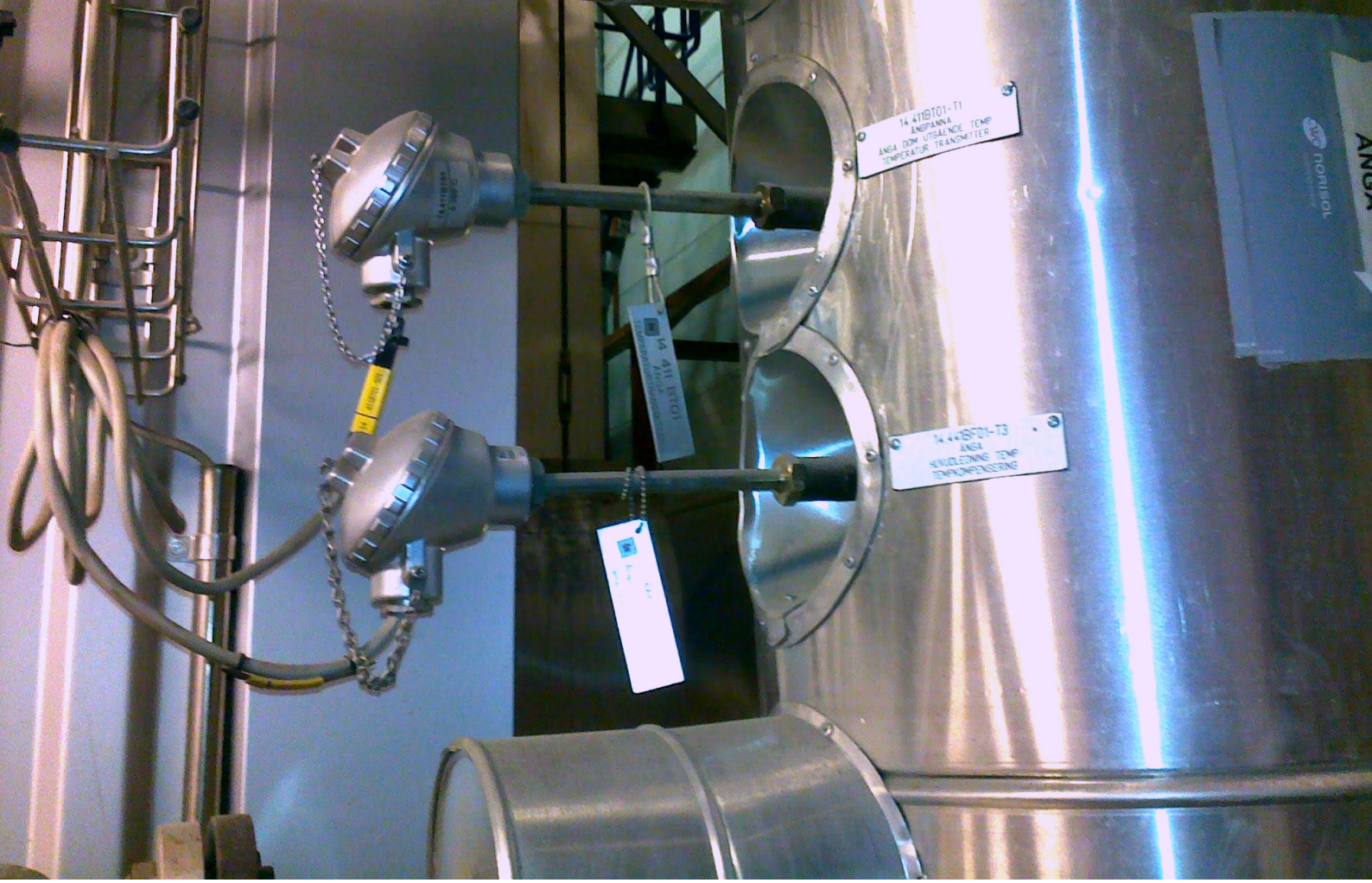

Thermowell

With Different Types of Connections

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Introduction:

ASPECO offers thermowells, in multiple configurations, for Industrial and Sanitary applications. Thermowell designs include fast response, heavy duty, flanged, welded, and threaded, as well as protection tubes and thermal dampening wells. If your application needs something a little different or the measurement is a challenge, our engineering team will modify and adapt one of these designs to meet your specific needs.

Description:

Thermowells are recommended for temperature instruments in process systems where pressure, velocity, or viscous, abrasive, and corrosive materials are present individually or in combination. A properly selected thermowell will protect the temperature instrument from damage resulting from these process variables. Additionally, a thermowell enables removal of the temperature instrument for replacement, repair, or testing without affecting the process system.

ASPECO specializes in the design and manufacture of all types of thermowells according to **ASME PTC 19.3-2010**. Our Thermowell is dedicated to unsurpassed quality, on-time delivery, and competitive pricing.

Thermowell Selection:

- **Process Connections:**

The thermowell interface to the process is influenced by various criteria. The pressure, vibration environment, clean ability, or the need to remove the thermowell, determine the appropriate process connection. Process Connection styles include:

- Sanitary Flange
- Threaded
- Flanged (Per ANSI B16.5)
- Socket Welded

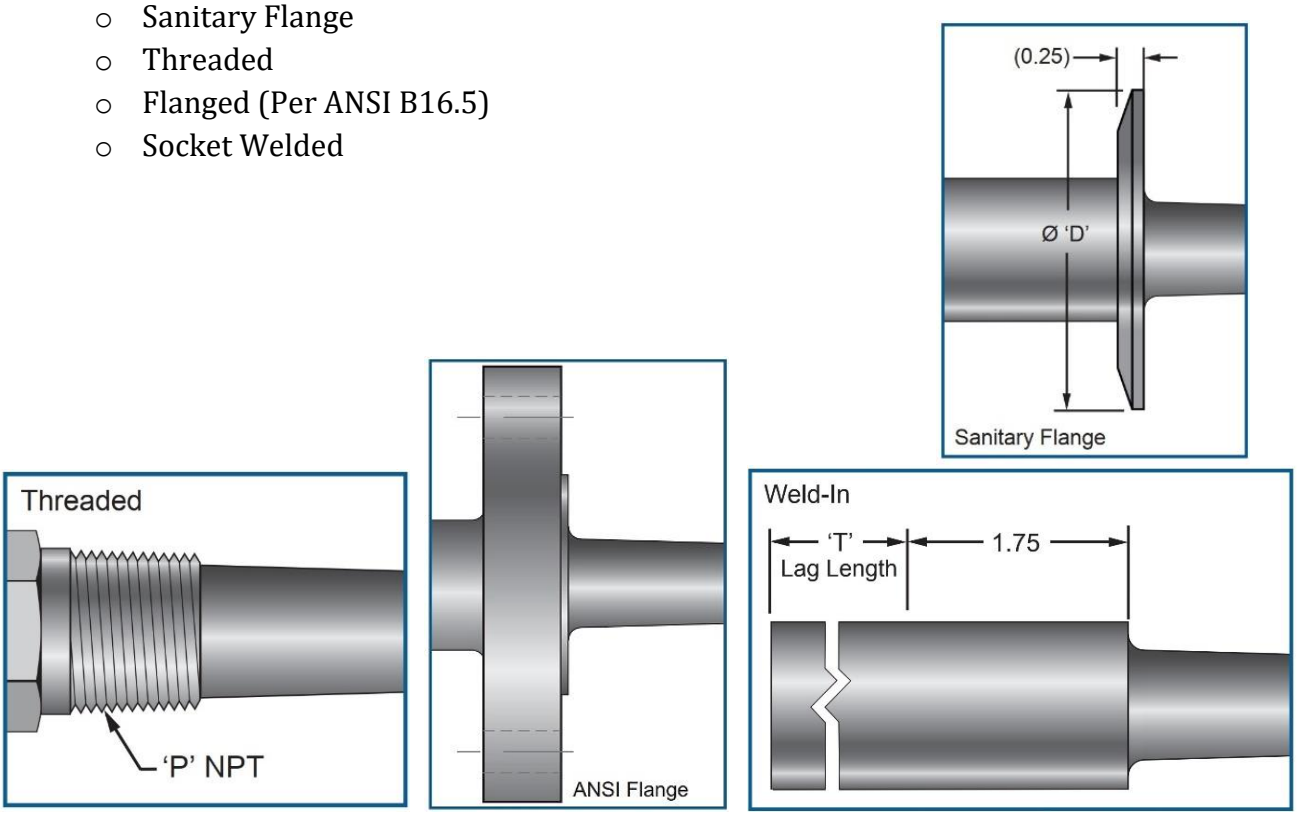

Figure 1: Process Connections

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- **Thermowell styles:**

Thermowells are designed with various configurations to align with the needs of the process. Conditions that influence style/shape include response time, flow rate, pressure, and installation approach. Thermowell styles include:

- Tapered
- Straight
- Stepped

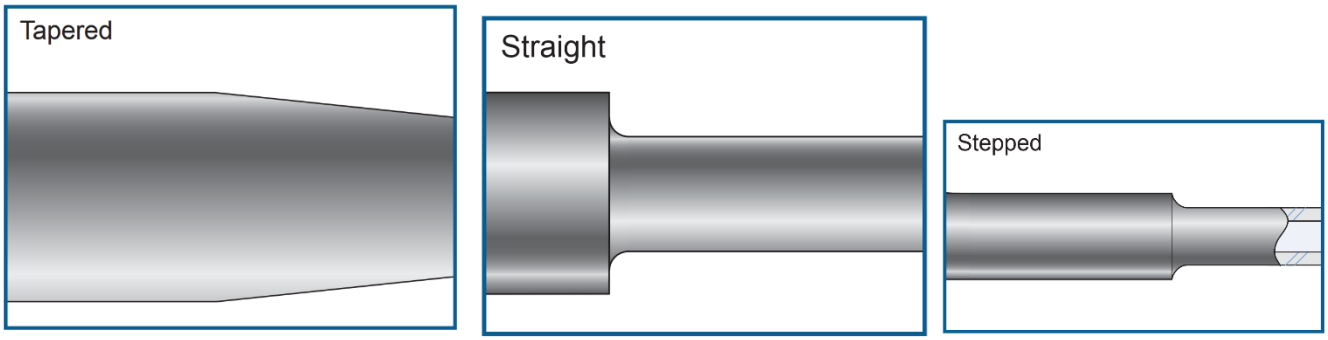

Figure 2: Thermowell styles

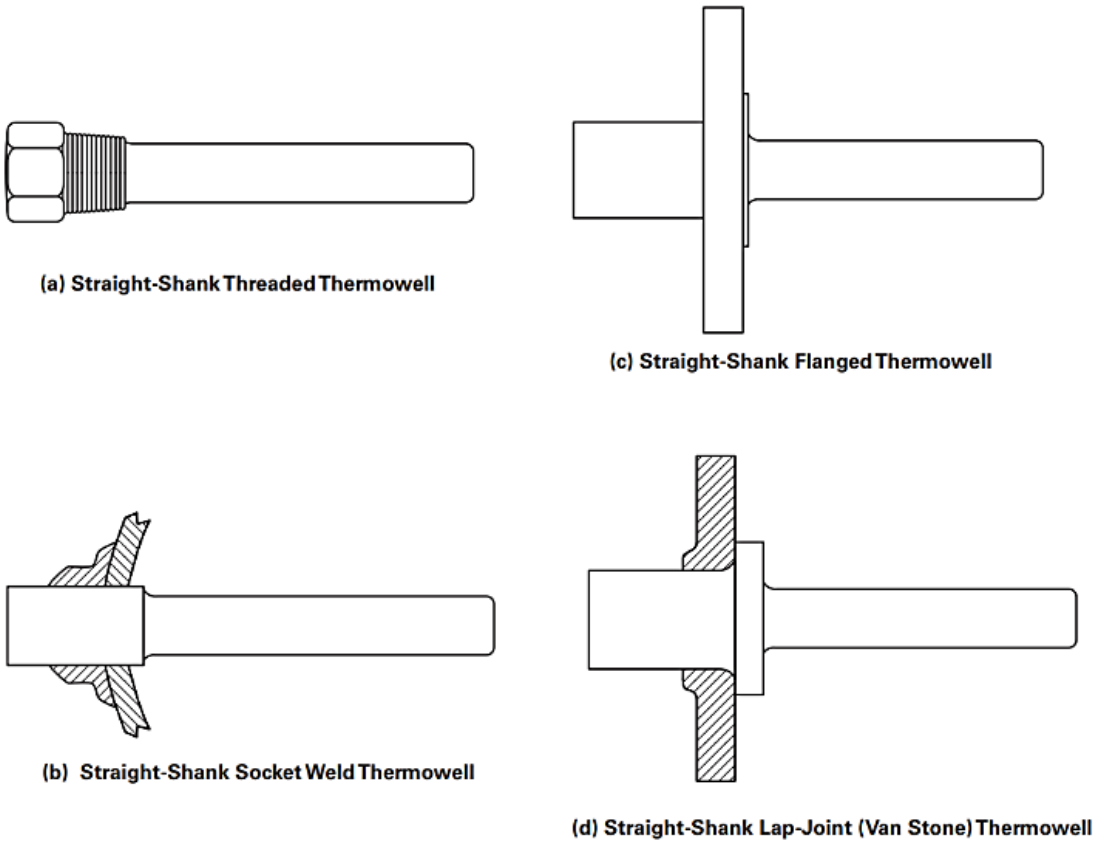

Figure 3: Examples of **Straight-Shank** Thermowells

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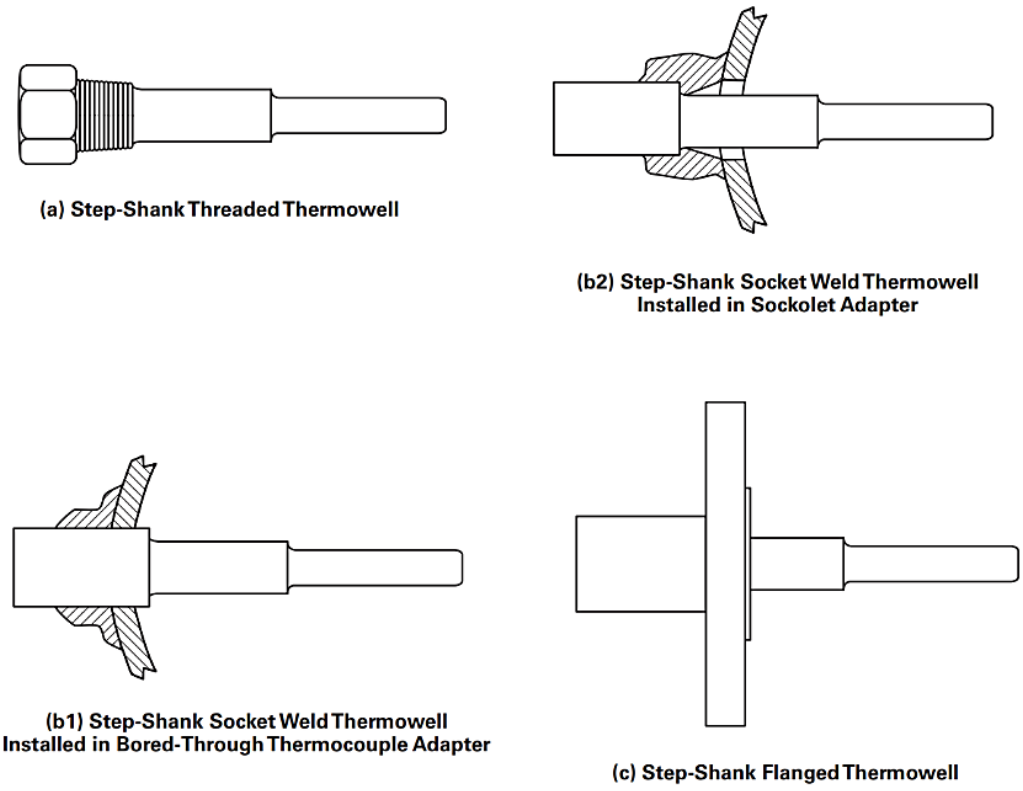

Figure 4: Examples of **Step-Shank** Thermowells

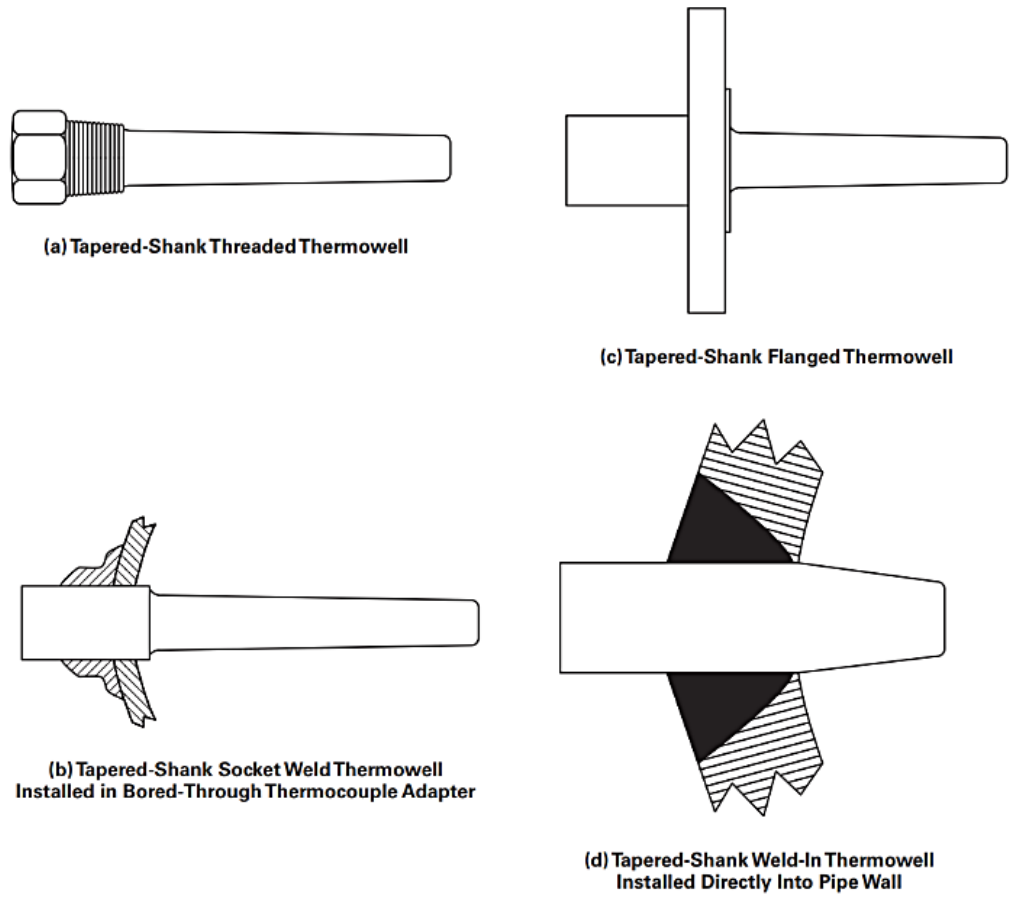

Figure 5: Examples of **Tapered** Thermowells

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- **Bore Size:**

The bore diameter and its relationship to the diameter of the sensor selected is an important consideration. Proper fit will improve the thermal contact for good response time as well as minimize movement due to vibration. The use of a thermally conductive substance, although not required, can improve thermal contact when response time is an important performance consideration. Standard Bore Diameter is φ=7mm although it depends on temperature element diameter.

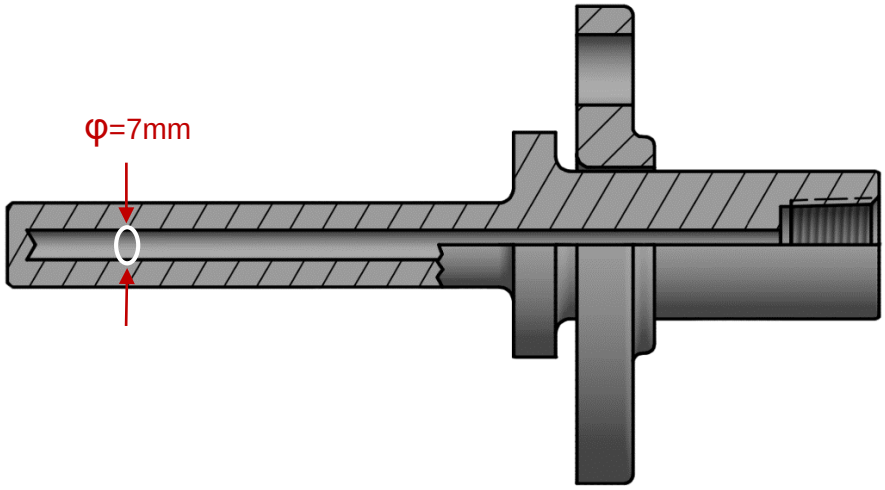

Figure 6: Bore Diameter

- **Immersion Length:**

The distance from the end of the well to the process connection, designated as 'U' is the immersion length. For best accuracy, this length should be long enough to permit the entire temperature sensitive part of the temperature sensor to be fully immersed in the process medium.

- **Materials:**

In general, the thermowell material chosen for the installation is governed mainly by the corrosive conditions of the process or thermowell strength needed to withstand the dynamic condition of the process.
Standard material grades include: 316 Stainless Steel, 304 Stainless Steel, 310 Stainless Steel, Hastelloy C276, Monel 400, Carbon Steel, Titanium, Inconel 600 and Inconel 625.

- **Vibration Effects:**

The vibration effects generated by the fluid flowing by the well, forming a turbulent wake must be fully understood to ensure the thermowell design will have sufficient stiffness so that the wake frequency will never equal the natural frequency of the thermowell. ASME PTC 19.3 - 2010 provides guidelines and calculations to ensure thermowell designs will withstand the operating and environmental conditions of your process.

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Thermowell Series:

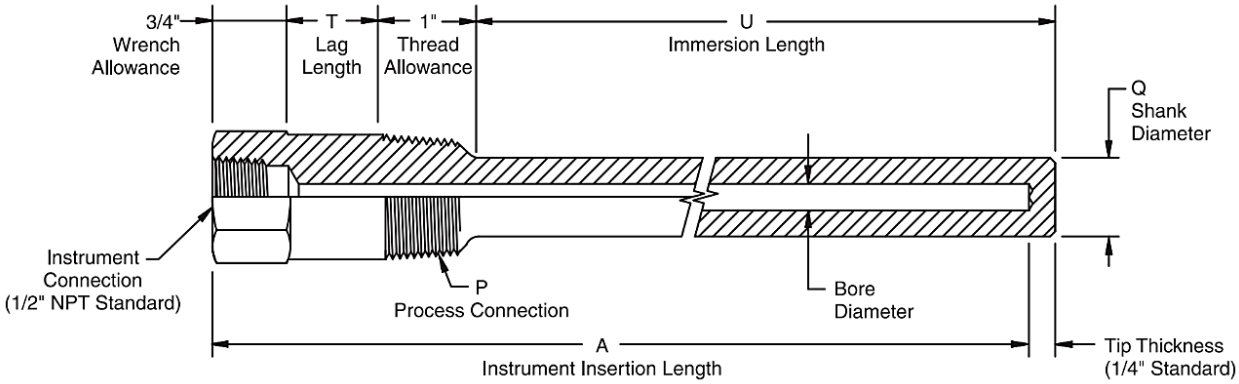

Figure 7: Threaded Straight

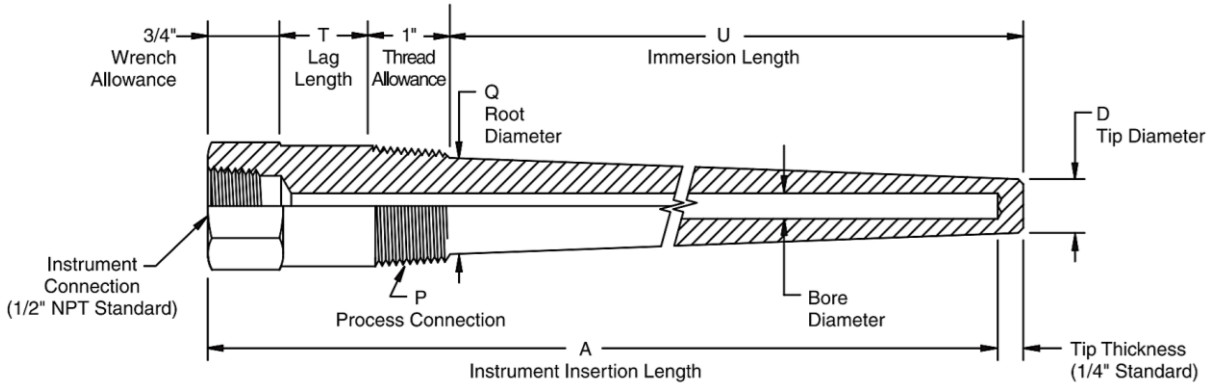

Figure 8: Threaded Tapered

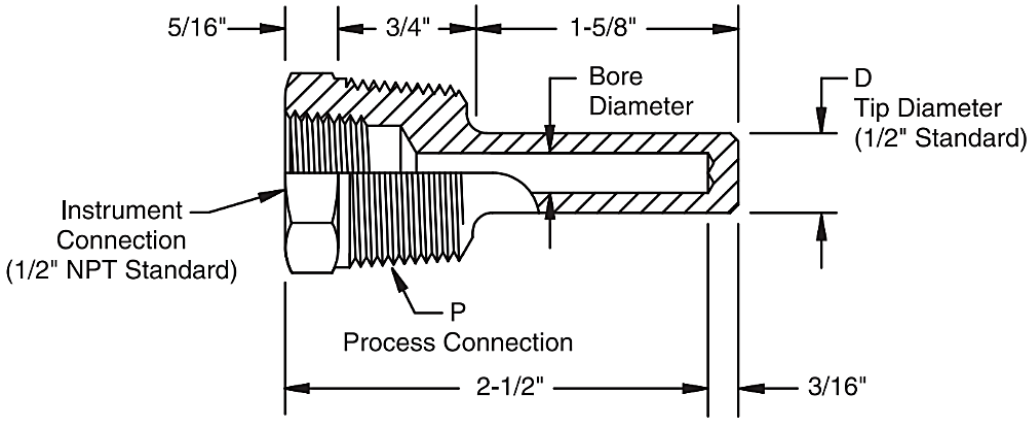

Figure 9: Threaded Limited Space Thermowell

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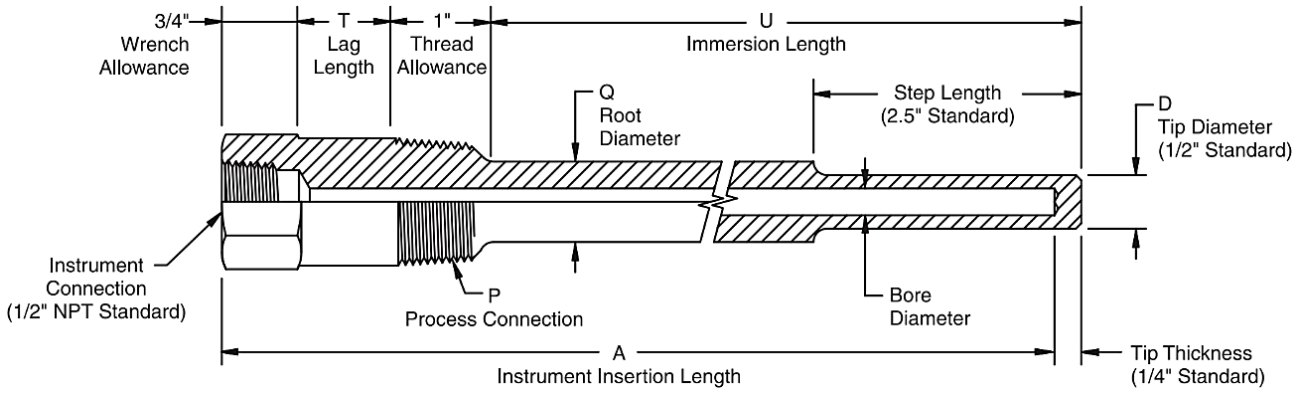

Figure 10: Threaded Stepped

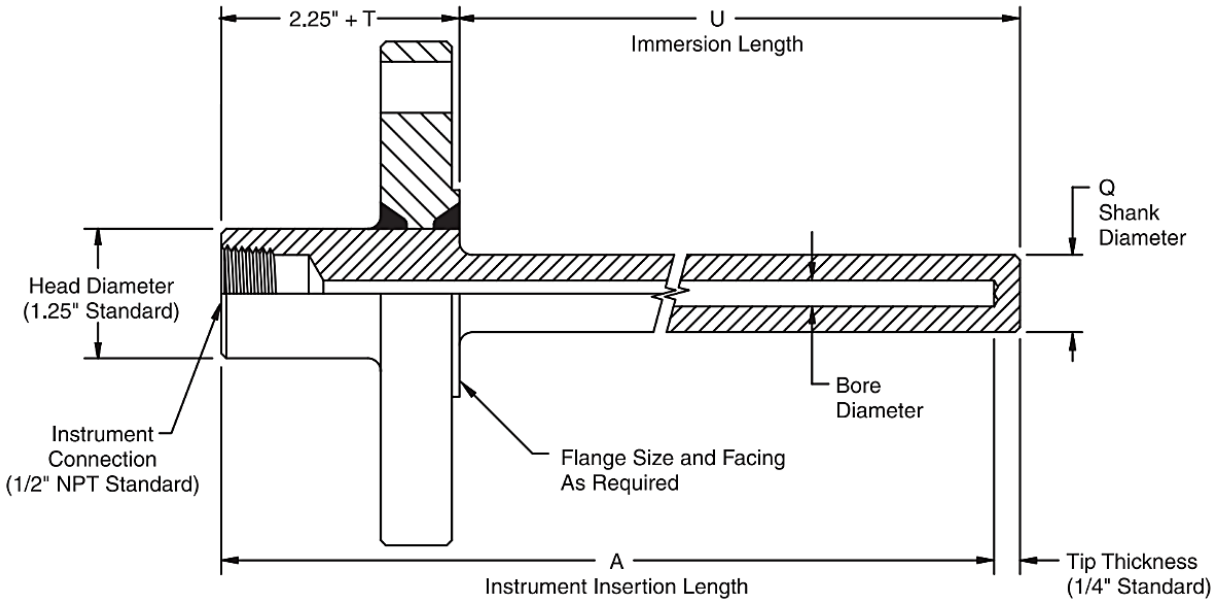

Figure 11: Flanged Straight

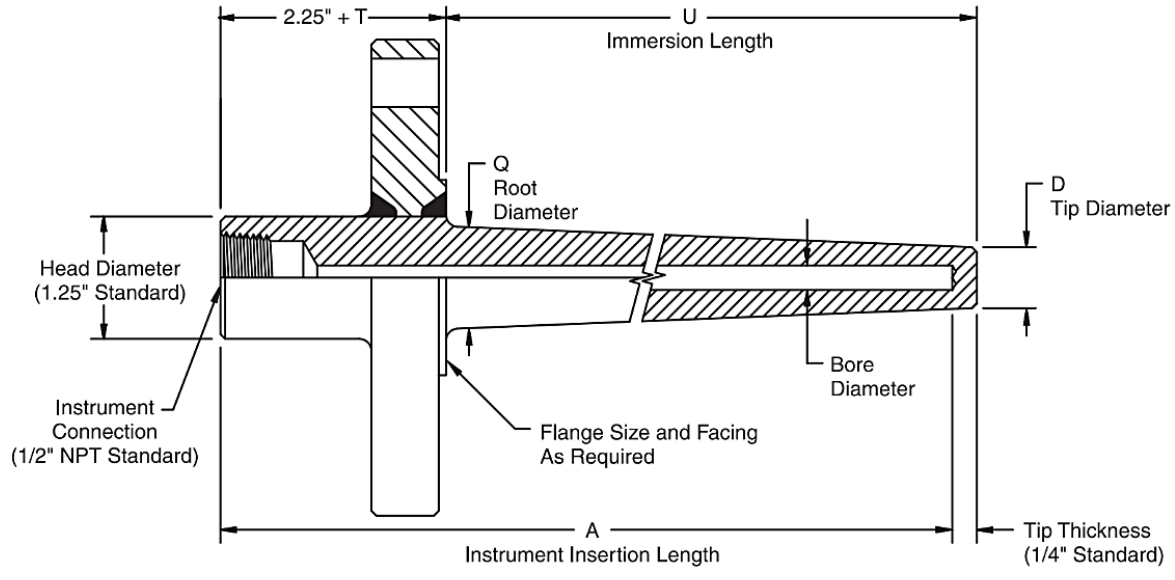

Figure 12: Flanged Tapered

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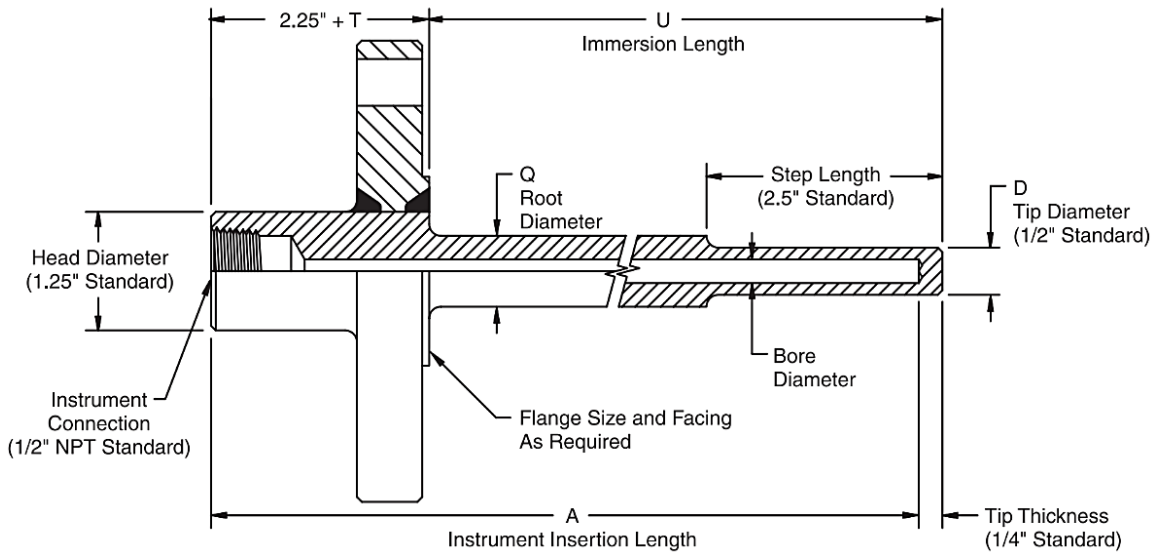

Figure 13: Flanged Stepped

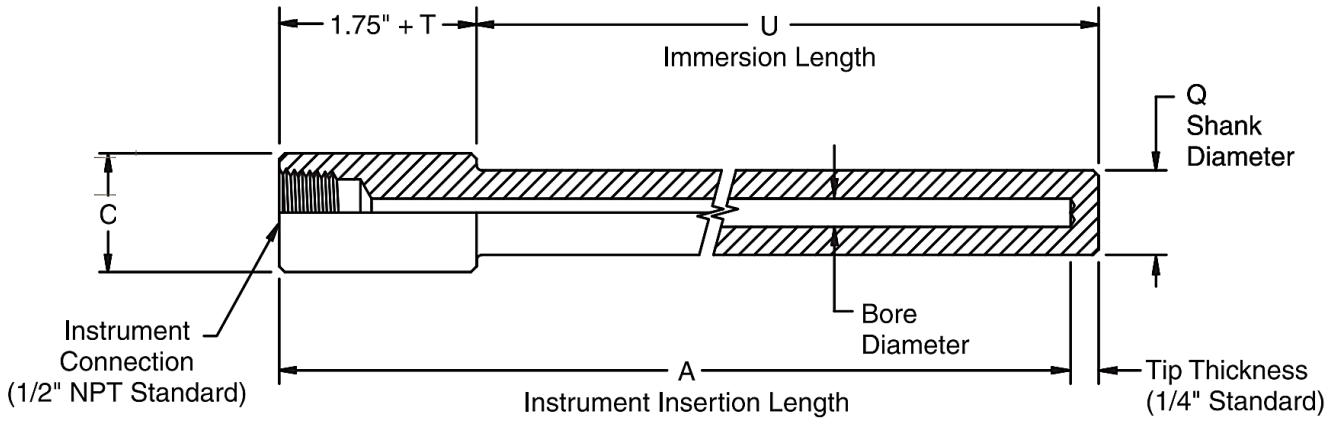

Figure 14: Socket Weld Straight

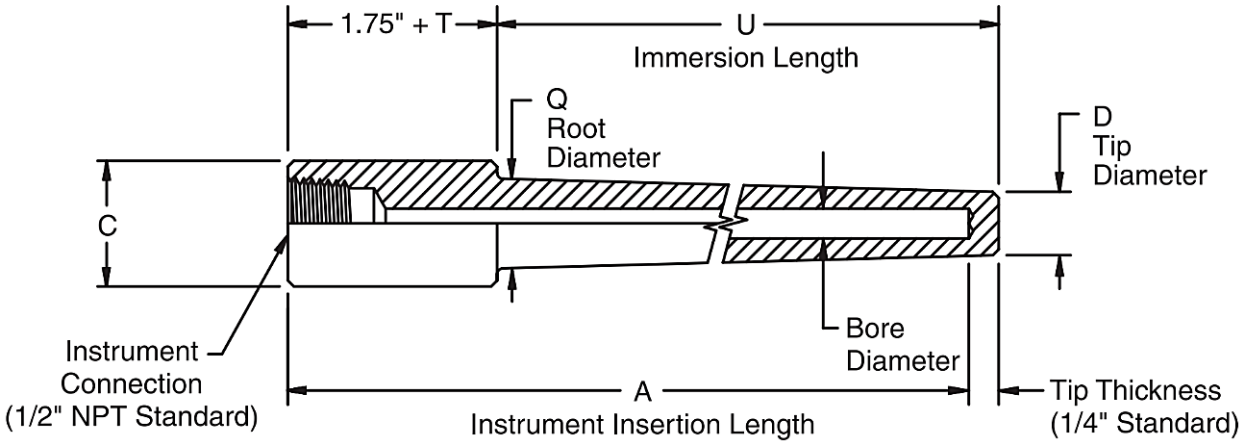

Figure 15: Socket Weld Tapered

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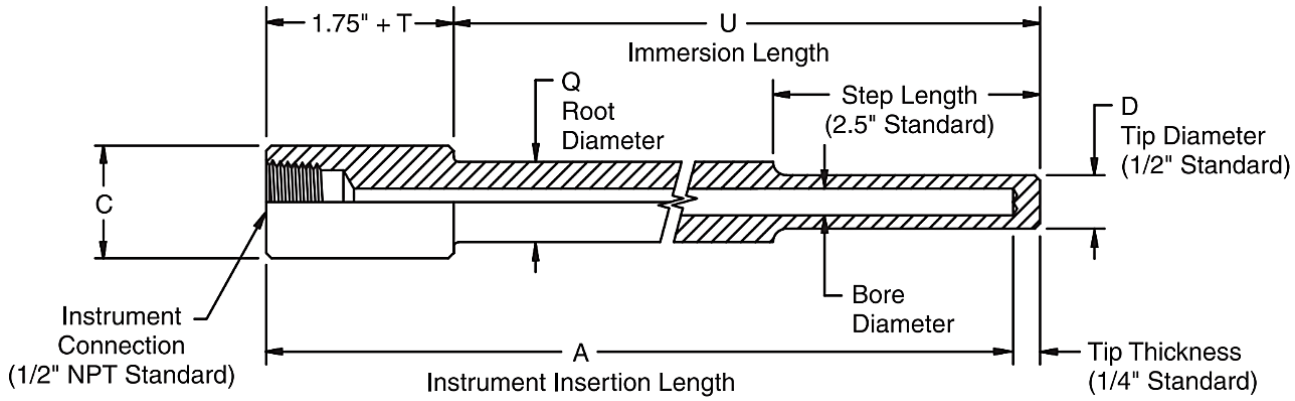

Figure 16: Socket Weld Stepped

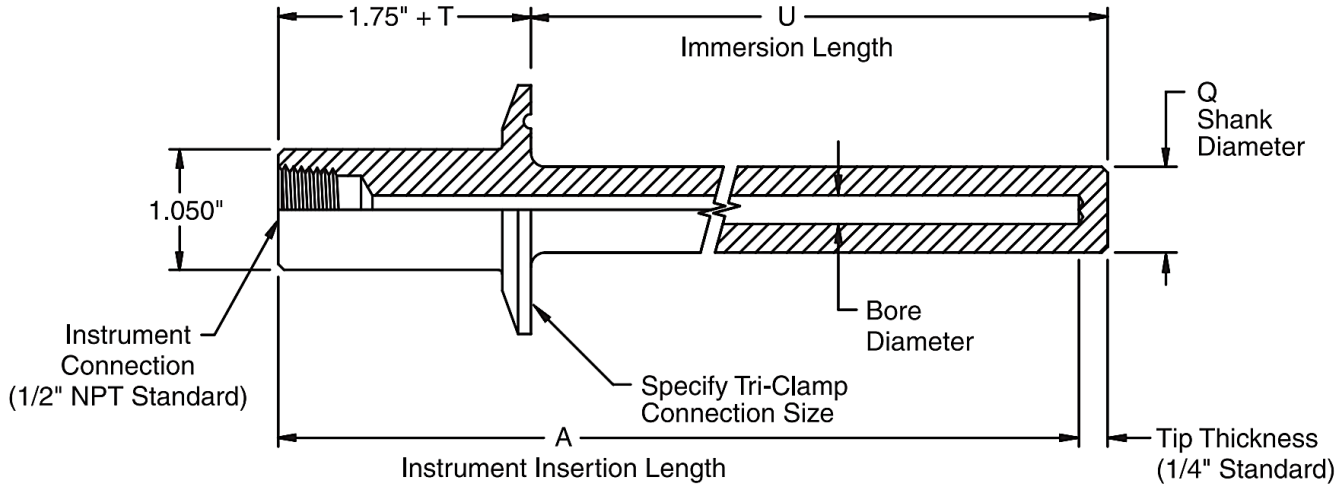

Figure 17: Sanitary Straight

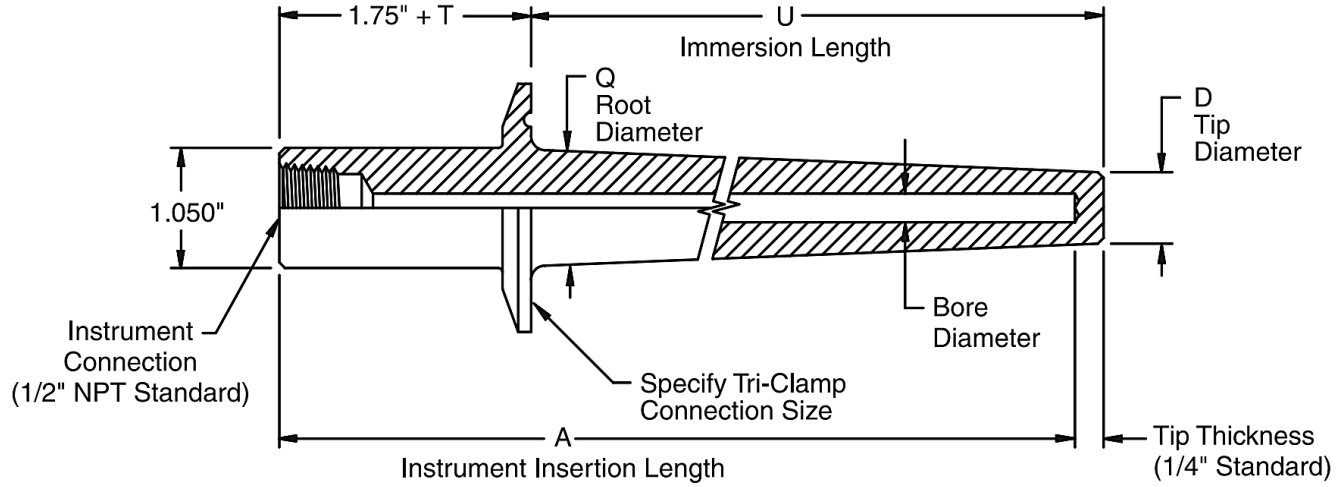

Figure 18: Sanitary Tapered

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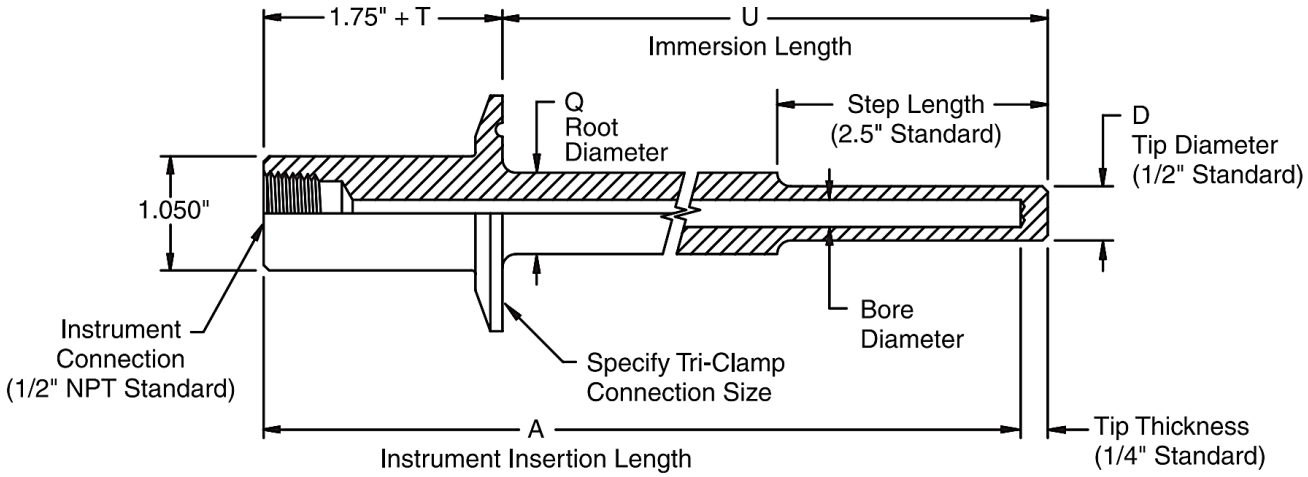

Figure 19: Sanitary Stepped

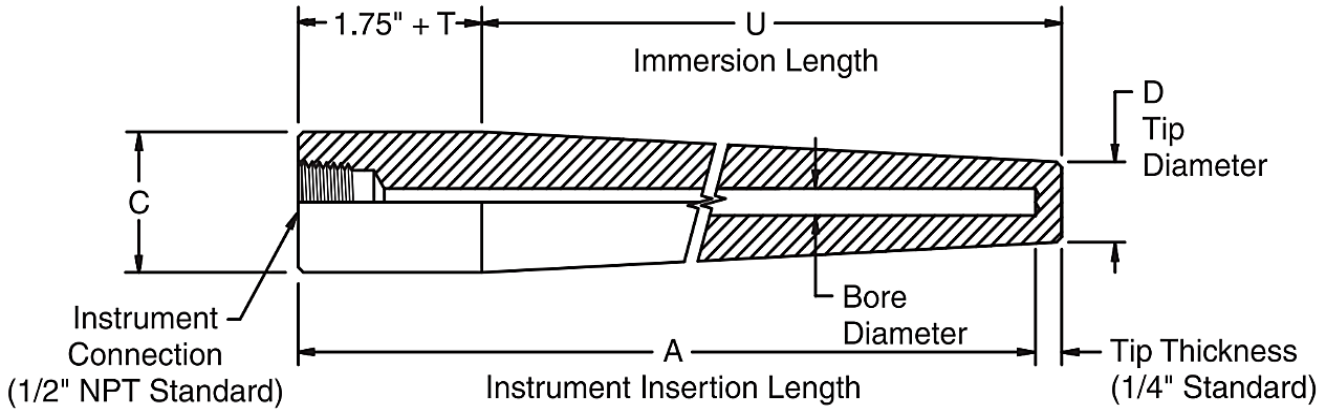

Figure 20: Weld-In Tapered

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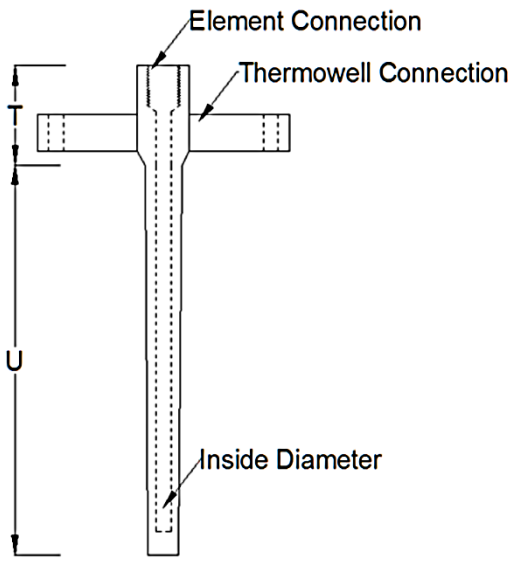
Flanged Thermowell:



Ordering information's		
Model	**Suffix Code**	**Description**
FTW -		
Thermowell Tip	T1	Tapered
	T2	Straight
	T3	Stepped
Material	C1	Carbon Steel
	S4	Stainless Steel 304L
	S6	Stainless Steel 316L
	S0	Optional
Thermowell Connection	F04	Raised Face Flange 150#
	F05	Raised Face Flange 300#
	F06	Raised Face Flange 600#
	F07	Ring-Type Joint Flange 150#
	F08	Ring-Type Joint Flange 300#
	F09	Ring-Type Joint Flange 600#
	FXX	Optional
Temperature Element Connection	A	1/4"
	B	1/2"
	C	3/4"
	D	1"
	O	Optional
Thermowell Inside Diameter	06	6mm
	07	7mm
	08	8mm
	10	10mm
	XX	Option
U Length (mm)	100	100 mm
	150	150 mm
	200	200 mm
	300	300 mm
	400	400 mm
	XXX	Optional
T Length (mm)	20	20 mm
	XX	Optional

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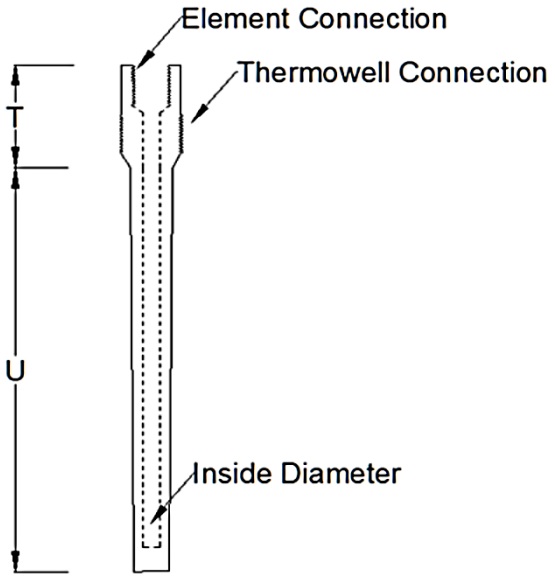
Threaded Thermowell:



Ordering information's		
Model	**Suffix Code**	**Description**
TTW -		
Thermowell Tip	T1	Tapered
	T2	Straight
	T3	Stepped
Material	C1	Carbon Steel
	S4	Stainless Steel 304L
	S6	Stainless Steel 316L
	S0	Optional
Thermowell Connection	N	NPT
	G	BSP (G)
	W	Socket Weld
	X	Optional
Temperature Element Connection	A	1/4"
	B	1/2"
	C	3/4"
	D	1"
	O	Optional
Thermowell Inside Diameter	06	6mm
	07	7mm
	08	8mm
	10	10mm
	XX	Option
U Length (mm)	100	100 mm
	150	150 mm
	200	200 mm
	300	300 mm
	400	400 mm
	XXX	Optional
T Length (mm)	20	20 mm
	XX	Optional

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