

3 IMPORTANT THINGS TO REMEMBER WHEN ATTEMPTING TO DETERMINE THE INSERTION LENGTH OF A THERMOWELL

THERMOWELL SELECTION CRITERIA

1. Selecting the proper insertion length is critical to the accuracy of your sensor. In considering length, it is important to allow the entire sensitive portion of the sensor to extend into the medium being measured. The proper length for a sensor installed into a liquid is the sensitive portion plus at least $5 \times \text{Ø}$. For gas or air, a probe should be installed a minimum of $10 \times \text{Ø}$ plus the sensitive length.

Generally, wire wound RTD's have a sensitive portion around $5/8"$. Shorter sensitive lengths are available with thin film and ceramic RTD's upon request. Both thermocouples and thermistors have small sensitive lengths so they are the best choice when working with short insertion lengths.

Note: It is important to consider the amount of the well passing through insulation, walls, fittings, etc., when determining the proper insertion length.

2. In selecting a thermowell, vibration is an important variable to be considered. When thermowells fail, they most often fail due to the vibrational effects they encounter. The pressure and temperature of a process does not usually have as much effect on the life of the thermowell as the fluid velocity of the media.

The media, flowing by the well forms a turbulent wake which has a definite frequency based on the diameter of the well and the flow of the fluid. The well must have sufficient stiffness so the wake frequency will never equal the natural frequency of the well itself. The flowing liquid generates a wake frequency around the well called the Von Karman Trail. Ask us about our Thermowell Program.

The tapered thermowell provides greater stiffness for the same sensitivity than straight thermowells.

The thermowell material chosen is mainly based on the corrosion conditions of the process and temperature range of the operation.

Pressure and velocity flow tables follow to aid our customers as a guide in the selection of thermowells.

Wells are safe if the resonant frequency is below the natural frequency of the well and if the fluid velocity is changing or fluctuating through the critical velocity point.

The values are very conservative and intended as a guide only.

JMS Southeast will be happy to assist you in the event of questions concerning your application and the selection of thermowells.

3. Ask for our design disk which calculates the stem loss temperature errors and velocity ratings for all common materials and mounting methods for thermowells.



Note:

JMS has a complete design guide on disc for your use. Call and ask for the Thermowell Design Guide.