Thermowells

Reliable, Sever and Safe
Thermowells for the
Oil & Gas
Industry

Thermowells for Temperature Sensors

Series TWTS

✓ Principle

TWTS thermowells are used to protect the temperature sensors inside the pipe line and/or equipment; through an aggressive flow either pressurized ambient. Using Thermowell allows change, replace and any other modification on the temperature sensor without line Shut down.
There are several different shapes also connection types in this category. More over the construction material can be vary in a wide range to be suit for working ambient conditions.

✓ Construction

Design and Calculation Standards:

ASME PTC, IPS, IEEE

Murdock Handbook.

Sizes : ½ " - 4" according to ANSI B 16.5 Flanges,
150 to 2500 lbs., also API Flanges up to 20,000 psi

Connection Facing : Raised Face, Flat Face, Ring Type Joint and Special Design on request

Shank or Stem : Drilled Bar stock form 50 up to 1000 mm,
Protection Tube from 30 up to 12,000 mm.

Bore (d) : Main Hole from 3 mm up to 20 mm; depend on the sensor outer diameter and shank diameter.

Material : Stainless Steel (Especially AISI 316), Carbon Steel, Monel, Inconel, Super Duplex and others on request.

Note: For material selection according to working ambient, please see the Thermowell catalog also the attached list as: "Material Specification Guide".

✓ **Technical Data**

Permanent Pressure lost : Negligible

Documents : Drawing, Full Dimensional Test Report, Wake Frequency Calculation Sheet, NDT reports, Material Analysis and Material Traceability Certificates.

Models:

- Flanged Type

Flanged thermowells are available in three manufacturing options: Welded with a fillet and groove weld

Fillet and groove welding is perfectly adequate in most circumstances; the weld is designed to be stronger than the required duty pressure. Welded with a full penetration weld

Full penetration welding provides a stronger weld joint and is specified when absolute assurance of pipe-work integrity is required. Manufactured from a single piece, shaped forging

Fully forged thermowells are manufactured from a shaped forging formed to closely resemble the final shape of the finished thermowell. This ensures correct granular alignment of all the thermowell components – absolutely vital in ensuring resistance to corrosion cracking.

- Weld-in and threaded Type

Manufactured from a single piece of high quality material, there is no welding in any of our weld-in or threaded designs.

Profiles : Three basic profiles are available:

➢ Straight

The stem diameter is consistent from the root to the tip

➢ Tapered

The profile tapers from the root to the tip

➢ Stepped

The lower portion of the thermowell steps to a smaller diameter.

A version of the stepped profile is available in the DIN designs where the step is a taper towards the tip. See the illustrations on pages 4 to 25 for details.

➢ Velocity collars

There are times when thermowell design fails to satisfy ASME PTC19.3 2010 TW criteria. Under these circumstances, it is advisable to shorten the thermowell and change the diameters of the stem root and tip. CPP engineers are available to advice on this. Where the thermowell would become too short, a velocity collar can be used.

A velocity collar relies on an interference fit between the thermowell collar and the mounting branch. The interference fit is the responsibility of the installation team and. although CPP can advise on the procedure, CPP cannot be held responsible for incorrect fitting of velocity collars

For further information such as dimensions and code numbers, please see the especial catalog or ask from engineering department of CPP Co.

Speed of Response:

The factors that affect speed of response are many and varied. They include:
The thermal conductivity of the medium the flow rate of the medium; the thermal conductivity of the thermowell material the thermowell dimensions;
All these factors play a part in the eventual speed of response.
In general, thermowell-mounted instruments respond to changes in temperature faster than the process itself. If an increased rate of response is required, it can be achieved only by reducing the amount of material surrounding the measuring element therefore a stepped design thermowell must be used. However, a compromise must be made between the rate of response achievable and the strength required from the thermowell design.

Special designs

There may be occasions where a design of thermowell is required that cannot be developed from the available codes. CPP`s experienced engineers can help with such a requirement. Whatever the need – be it a special design or a problem with erosion or corrosion – CPP Co. can help.

Some Pictures of Thermowell: