

How to Select the Correct Heat Exchanger Tube Plug

Torq N' Seal® Heat Exchanger Tube Plugs

Introduction

Heat exchanger maintenance is a critical factor towards ensuring a continually successful process and a positive return on investment for your exchangers. Identifying tube leaks early and sealing them effectively leads to a longer, more productive life while reducing unplanned downtime and simplifying planned turnarounds. **Torq N' Seal®** Heat Exchanger Tube Plugs provide a *fast, simple, and effective* solution to inevitable tube leaks. Understanding all the considerations ahead of time and having the correct heat exchanger tube plugs on hand makes all the difference in a successful maintenance plan.

Factors to Consider

Each heat exchanger serves a different purpose and therefore must be thought of differently when it comes time to plug a leaking tube. The important factors to consider are as follows:

- Operating Pressure
- Operating Temperature
- Tube Size
- Tube Material
- Special Considerations
 - Fin-Fan Exchangers
 - Offshore Use

Operating Temperature and Pressure

The first factor to consider is the operating temperature and pressure of the heat exchanger. This will determine whether a high- or low-pressure plug is required. For pressures less than 250 psi and temperatures less than 300 deg F, the most cost-effective solution will be a low-pressure tube plug. These types of plugs generally use a rubber or elastomeric seal that gives them a greater expansion range and lower cost. Industrial and HVAC condensers are a prime candidate where the **Torq N' Seal® Condenser Plug** is the perfect solution. They are installed in just 30 seconds with a standard torque wrench, have unmatched expansion capacity, and have excellent chemical resistance to refrigerant, acids, and many more fluids.

On the other hand, when the operating pressure is greater than 250 psi, a high-pressure tube plug is required. This is where the signature **Torq N' Seal® Heat Exchanger Tube Plug** provides an ideal solution. **Torq N' Seal®** has a sealing capacity up to 7,000 psi and the easiest installation procedure on the market (less than 60 seconds, only a standard torque wrench is required).



85 Industrial Avenue, Little Ferry, New Jersey U.S.A. 07643
Phone: (201) 641-2130 /// Fax: (201) 641-2309 /// Email: SALES@JNTTECHNICAL.COM

Tube Size – Inner Diameter

The next factor to consider is the inner diameter of the tube, which will determine the size of the plug. There are two ways to determine this: 1) direct measurement with 3-point micrometer or 2) design calculation. The direct measurement method is always preferred when possible but can be difficult since most heat exchangers are critical pieces of equipment. Taking them out of service for a measurement can be costly so recording any measurements from a previous outage or turnaround can be very useful. It is recommended to add this information to the U1 datasheets, so it is readily available.

When there are no prior measurements and the exchanger cannot be taken offline, the tube size must be calculated from the exchanger information: Tube Outer Diameter, Tube Wall Thickness.

$$(\text{Tube Inner Diameter}) = (\text{Tube Outer Diameter}) - 2 * (\text{Tube Wall Thickness})$$

Select a plug such that the Tube Inner Diameter falls within the specified expansion range for the plug.

Tube Material

With low pressure tube plugs such as the **Torq N' Seal® Condenser Plugs**, there is no need to consider the tube material. However, it is very important for high pressure tube plugs that will rely on a metal to metal mechanical contact seal. By matching the plug material to the tube material, we can match the hardness, thermal expansion properties, and temperature limits. This ensures an adequate seal that will not loosen over time due to any cycling of the exchanger. **Torq N' Seal® Heat Exchanger Tube Plugs** come in a variety of materials to match basically every tube in existence, from Brass and Stainless Steel all the way to Zirconium and Super Duplex. Thus, it is always worth matching the tube material as closely as possible.

Special Considerations

Fin-Fan Exchangers: The water box of a fin-fan exchanger can make accessing the tubesheet difficult and limit your ability to locate the plugs in the correct location. **Torq N' Seal®** plugs have an optional Tubesheet Ring that can be used to properly locate the plug at the face of the tubesheet.

Offshore Use: Offshore applications generally use the readily available saltwater as a cooling mechanism in heat exchangers. However, saltwater is extremely corrosive to certain materials and can cause even stainless-steel parts to degrade. As such, **Torq N' Seal®** plugs can come equipped with a Titanium screw that will not corrode when exposed to this hot seawater.

Conclusion

Torq N' Seal® Heat Exchanger Tube Plugs are the solution of choice for heat exchanger plugging projects globally, and now you can select the correct plug for your application to save time, money, and headaches on your next turnaround or outage. ***Fast, Simple, Effective. Torq N' Seal®.***

For more information, please visit WWW.TORQ-N-SEAL.COM, email SALES@TORQ-N-SEAL.COM, or call 1 (201) 641-2130.



85 Industrial Avenue, Little Ferry, New Jersey U.S.A. 07643
Phone: (201) 641-2130 /// Fax: (201) 641-2309 /// Email: SALES@JNTTECHNICAL.COM