CURTISS-WRIGHT

EST Group

Pop-A-Plug® CPI/Perma

Heat Exchanger Tube Plugging System

Applications

- Condensers
- Shell and Tube Heat Exchangers
- Air Cooled Heat Exchangers
- Lube Oil Coolers
- Drain Coolers
- Floating Head Heat Exchangers
- Reboilers
- Boilers
- Low Pressure Feedwater Heaters
- Evaporators
- Air Chillers

Description

Cited in ASME PCC-2-2011 Repair of Pressure Equipment & Piping, EST Group's Pop-A-Plug CPI/Perma is a safe, economical, and reliable tube plugging solution for condenser, heat exchanger and cooler units operating at pressures to 1000 PsiG (69 BarG). Unlike elastomer plugs that need to be replaced every 5-7 years, the Pop-A-Plug CPI/Perma effectively seals the tube throughout the heat exchanger's life cycle.

The Pop-A-Plug CPI/Perma tube plugging system is the only plug that features patented Internally Serrated Sealing Rings designed to maintain a helium leak-tight ($1x10^{-6}$ cc/sec) seal under extreme thermal and pressure cycling throughout the heat exchanger's life cycle.

The Result: Pop-A-Plugs have the lowest life cycle cost of any tube plugging system.

As a permanent tube plugging solution, Pop-A-Plug's "once and done" installation process maximizes plant uptime. Just Set 'em and Forget 'em.

Designed to fit tube ID sizes from 0.472" to 2.067" (11.99 - 52.5 mm), the Pop-A-Plug CPI/Perma can also be utilized for Through-The-Tube™ plugging. In applications where the far-end of the exchanger is not accessible (floating head heat exchangers), extensions can be used to pass the plug through the length of the tube and install Pop-A-Plug CPI/Perma in the far-end tubesheet area when the installer is located at the near-end. Doing this eliminates the added time and expense of removing the far head or extracting the tube bundle.

Competitive Advantage

- Quick installation – plug installation time less than 15 seconds, maximizing plant uptime.
- Permanent and Reliable - engineered for optimal performance throughout the heat exchanger's life cycle.
- Metal to metal sealing eliminates plug degradation concerns due to thermal expansion and corrosion resulting from galvanic interaction between the plug and tube.
- Safer and more cost effective than welding tapered pins or explosive plugs.
- Controlled, repeatable installation minimizes installer fatigue and eliminates the need to enter confined spaces during plug installation.
- Meets EPRI Plug Selection criteria
- Will not degrade and leak like Elastomer Tube Plugs
- Patented Internally Serrated Sealing Ring design (U.S. Patent Number 5,437,310)
- Helium Leak Tight ($1x10^{-6}$ cc/sec)

Pop-A-Plugs are the ideal tube plugging solution for Air Cooled Heat Exchangers.

Features and Benefits

- The Pop-A-Plug CPI/Perma is an all metal, three piece mechanical tube plug consisting of a tapered pin, an Internally Serrated Sealing Ring, and a Breakaway.
- The Pop-A-Plug CPI/Perma is a permanent sealing solution with a removability option that is used as a fast and reliable method for plugging tubes in condensers, coolers, chillers and other heat exchangers that operate at pressures up to 1,000 PsiG (69 BarG).
- Designed to maintain a helium leak-tight ($1x10^{-6}$ cc/sec) seal under extreme thermal and pressure cycling.
- The Pop-A-Plug CPI/Perma design and method of operation ensure quick and consistent installation every time.

QA and Product Certifications

- ISO 9001: Quality Program
- TÜV Nord Suitability and Type Test Certification
- NUPIC Approved Supplier
- Cited in ASME PCC-2 as an accepted permanent heat exchanger tube plugging method

Quick Installation

- Verify heat exchanger information (tube size, tube ID, tube material, pressure, temperature).
- Gage the tube I.D. with Go/No-Go Gage to confirm proper sizing.
- Use Tube Preparation Brush to remove pitting and tube defects and roughen tube surface to maximize pressure hold capability of Pop-A-Plug CPI/Perma.
- Gage the tube I.D. with the Go/No-Go Gage to confirm prepared I.D. is still properly sized.
- Select the appropriate Pop-A-Plug CPI/Perma size that matches Go/No-Go Gage size.
- Assemble Hydraulic Ram and Pump. Thread Pop-A-Plug CPI/Perma onto Pull Rod Assembly.
- Position Pop-A-Plug CPI/Perma within tube at tubesheet location and activate Hydraulic Ram to install.
- Pop-A-Plug CPI/Perma is installed when Breakaway "Pops" and separates from the Pull Rod Assembly.
- Remove Breakaway stub from the installed Pop-A-Plug CPI/Perma.

EST Group's Job Box program increases plant uptime by providing you with all the installation tools and plugs you need on site and ready to use prior to any planned outage or emergency.

Specs/Material

Inventory of Pop-A-Plug CPI/Perma plugs is maintained to fit tube I.D. sizes from 0.472" to 2.067" (11.99 - 52.5 mm). The Pop-A-Plug CPI/Perma has been engineered for applications ranging up to 3" (76.2 mm). Materials available from inventory include:

- Carbon Steel
- SS 316/316L
- Brass
- Titanium
- CuNi 70/30
- Monel
- SS 304/304L
- CuNi 90/10
- Chrome Moly 4142
- Chrome Moly F5/F9/F11/F22
- AL6XN
- SS 317L/321/347
- SS 400 Series Alloys
- SS 904L
- SS 254 SMO
- SS 20CB3/Alloy 20
- Duplex SS
- Super Duplex SS
- Inconel Alloys
- Incoloy Alloys
- Hastelloy Alloys
- Nickel 200/201
- Zirconium
- Carbon Steel A350 LF2

Pop-A-Plugs are currently available in over 35 alloys. Contact EST Group if materials other than those listed above are needed. EST Group provides emergency manufacturing services 24 hours a day/7 days a week to meet your specific plugging needs.

FAQs

Q Can the Pop-A-Plug CPI/Perma and tube materials be different and still achieve the desired functionality?

A No. The Pop-A-Plug CPI/Perma and tube materials must closely match to accommodate thermal expansion and avoid problematic galvanic interaction.

Q What is the minimum quantity of Pop-A-Plug CPI/Permas that can be ordered?

A Pop-A-Plug CPI/Permas are sold in kits that contain 10 plugs and 1 Go/No-Go Gage.

Q Do the tubes need to be prepped before installation?

A Yes. Prepping the tubes provides the ideal surface needed to achieve a leak tight seal.

Q What is the average amount of time required for installation?

A The average time for the Hydraulic Ram to do a full stroke and pop the breakaway is less than 15 seconds.

Q What length tube can be plugged using the Through-The-Tube plugging technique?

A The Small Ram can set a Pop-A-Plug CPI/Perma into place up to 25ft (7.6 m) away from the near-end tubesheet. The Large Ram can set a plug into place up to 80ft (24.4 m) away from the tubesheet.

Q Should the Breakaway stub be removed from the Pop-A-Plug CPI/Perma after it has been installed?

A Yes. The Breakaway stub should be removed from the installed plug to prevent any potential for FME issues.

Q What is the max pressure rating of the Pop-A-Plug CPI/Perma?

A Pop-A-Plug CPI/Perma is rated to handle pressures up to 1000 PsiG (69 BarG).

Q Is it possible to remove a Pop-A-Plug CPI/Perma after it has been installed?

A Yes, with the use of the EST Group Plug Removal Tool, a CPI/Perma Plug can be removed in a few simple steps.

Q What is the lead time for Pop-A-Plug CPI/Perma kits in standard sizes and materials?

A Stock items are available for shipment the same day that the order is placed. If items are not in stock, every effort is made to meet your scheduling needs.

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