Pop-A-Plug® CPI/Perma
Heat Exchanger Tube Plugging System

Cited in ASME PCC-2 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.


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
- Helium Leak Tight (1x10⁻⁶ cc/sec)

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

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 Registered Facility
- 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

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
- SS 317L/347
- SS 400 Series Alloys
- SS 904L
- SS 254 SMO
- Hastelloy Alloys
- Nickel 200/201
- Zirconium
- Carbon Steel A350 LF2
- AL6XN
- SS 317L/321/347
- SS 400 Series Alloys
- SS 904L
- SS 254 SMO
- Hastelloy Alloys
- Nickel 200/201
- Zirconium
- Carbon Steel A350 LF2

FAQs

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.