

**REQUIRED INFORMATION TO SPECIFY  
EST PRODUCTS AND SERVICES**

In order to accurately prepare a bid for EST's products and services we require the following information about each application.

**Pop-A-Plugs®, Pop-A-Plug System Installation and Removal Equipment, Pop-A-Plug Tube Stabilizers**

- (a) Tube OD and wall thickness.
- (b) Tube material (e.g. ASTM, ASME, DIN or JIS material spec). If the material is to some other standard please provide typical chemical and physical analysis of the material so that we can attempt to find a match.
- (c) Tube side Operating Temperature and Pressure.
- (d) Shell side Operating Temperature and Pressure.
- (e) Type of service (e.g. feedwater heater, condenser, oil cooler, reboiler, air cooled heat exchanger, etc.).
- (f) Tubesheet material (e.g. ASTM, ASME, DIN or JIS material spec). If the material is to some other standard please provide typical chemical and physical analysis of the material.)
- (g) Tubesheet thickness.
- (h) Method of tube-to-tubesheet joint, e.g. rolled, rolled and welded, etc.
- (i) Straight tubes or u-tubes?
- (j) Are tube end inserts or sleeves installed?
- (k) Are tube ID's enhanced or rifled?
- (l) Are tube OD's finned? If so are fins brazed/welded on or are they rolled fins?
- (m) If tubes are finned what is the tube ID within the finned portion of the tube?
- (n) Is the unit a hemi-head design or are there any obstructions that would interfere with or limit access to the tube ends?
- (o) Is there a channel head or header box is present? What is its depth?
- (p) For Tube Stabilizers please supply the following
  1. What is the minimum axial distance from the tube to be stabilized to the head, partition plate, channel cover or any obstruction restricting access to tube end?
  2. Are they stabilizing fractured tubes, strengthening damaged tubes or both?
  3. If fractured,
  4. What is the distance from the tube sheet face to the fracture?
  5. What is the distance from the tube sheet face to the support plate beyond the fracture?
- (q) Is the application a Near End, Through-The-Tube Plugging or Tube Stabilizing application?
- (r) If it's a TTT Plugging or Stabilizing application, does the customer have any previous experience with TTT / Stabilizing procedures? Do they have specific experience with TTT plugging / stabilizing on the unit(s) in this inquiry?
- (s) Will the customer be providing the installers, are they aware that EST offers on-site Training and / or complete turnkey installation services?
- (t) If this is a Service Job please refer to questions (u) and (v) in Hydra-Loc Sleeving section below.

**Hydra-Loc™ Tube Sleeving** (Sleeving work is supplied / performed under a Service Contract, items (u) and (v) are Field Service specific questions)

- (a) Explanation of problem, along with a description or scope of what needs to be fixed and the objectives of a repair. Include job specifics as dictated by customer (what cleaning, milestones, inspections, testing, mock-ups, etc. will be required)
- (b) Tube OD and wall thickness: include info as to whether tube is average wall (AWG) or minimum wall.
- (c) Tube Material (e.g. ASME, ASTM, DIN or JIS standard), include tube condition (annealed, as drawn, etc.)
- (d) Type of service (e.g. feed water heater, condenser, oil cooler, reboiler, air cooled heat exchanger, etc.).
- (e) Straight tubes or u-tubes?
- (f) Are tube end inserts or sleeves installed?
- (g) Are tube OD's finned? If so are fins brazed/welded on or are they rolled fins?
- 6. If tubes are finned what is the tube ID within the finned portion of the tube?
- (h) Tube end configuration (tube ends flared to tubesheet, tube ends project from tubesheet (if so how far?), etc.)
- (i) Has the unit been previously retubed? If yes, how many times?
- (j) How many tubes in bundle?
- (k) How many tube ends are to be sleeved?
- (l) Tubesheet thickness.
- (m) Description of tube-to-tubesheet joint
  - a. Mechanically expanded
  - b. Mechanically expanded and seal welded
  - c. Strength welded
- (n) Tubesheet material (to ASME, ASTM, DIN or JIS standard)



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- (o) Is tubesheet clad or epoxy coated? If yes identify cladding of coating material.
- (p) Condition of tubesheet
  - a. Lightly eroded / corroded
  - b. Moderately eroded / corroded
  - c. Severely eroded / corroded
- (q) Characterize any obstructions that would limit or restrict access to the tube ends.
- (r) What sleeve length is required? This is usually based on actual ID measurements made at number of points within the tube bore (tube degradation). Is the measurement data available? If yes, provide data.
- (s) Can photos of the tubesheet and unit internals be provided?
- (t) It is normal for EST to inspect and conduct a measurement survey of each unit several weeks or months in advance of commencing any work.
  - a. When can the units be available for such an inspection?
- (u) What Environmental, Safety & Health requirements are there?
  - a. What safety training is required to work on site?
    - i. If training is required by facility, when can training be provided.
  - b. What security requirements does the plant have?
  - c. What insurance information from EST is required.
- (v) The following services will typically be required, who will be responsible for making these arrangements, the plant or EST?
  - a. Compressed air, minimum 80-125 psi, 10 SCFM, clean & dry.
  - b. Electricity (110V, 20A, 60Hz)
  - c. Distilled water
  - d. Scaffolding as required.
  - e. Lighting
  - f. Rigging (moving heavy equipment to / from and within site)

**G-Series Tube Testing Guns.** Information required for all G-Series Guns is denoted as (All). Information specific to a particular gun is also identified.

- (a) Tube OD and wall thickness. (All)
- (b) If a channel head or header box is present what is its depth. (All)
- (c) Are tube inserts (sleeves, ferrules, etc.) used, if so what is the ID of the insert? (All)
- (d) Tube pitch and spacing (G-650)
- (e) Tube end configuration, e.g. are tube ends flared? Do the tube ends project from the tubesheet and if so how far? (G-650)
- (f) Is the customer aware that EST Field Services is capable of providing on-site testing services?

**GripTight™ and SQ2 High Pressure Test Plugs**

- (a) Pipe size and schedule or tube OD and wall thickness.
- (b) Operating pressure requirements.
- (c) Pipe or tube material (e.g. ASME, ASTM, DIN or JIS specification number when possible). If the material is to some other standard please provide typical chemical and physical analysis of the material.
- (d) For boiler tube testing applications, are the tube ends counterbored and if so what are the counterbore dimensions e.g. I.D. and depth?
- (e) If the required plug size is greater than 12" then delivery may run in excess of 3-4 weeks (15-20 business days) from receipt of order, if this not acceptable how quickly does the customer require the plug?
- (f) Is the customer aware that EST Field Services is capable of providing on-site testing services?

**Double Block & Bleed Plugs**

- (a) Pipe size and schedule of the pipe to which the flange is (or is to be) welded.
- (b) Operating and / or Test pressure requirements.
- (c) Pipe or tube material (e.g. ASME, ASTM, DIN or JIS specification number when possible). If the material is to some other standard please provide typical chemical and physical analysis of the material.
- (a) If the flange is welded to something other than a length of pipe such as a nozzle, tee or elbow please provide a dimensioned sketch of the application.
- (d) If the required plug size is greater than 12" then delivery may run in excess of 3-4 weeks (15-20 business days) from receipt of order, if this not acceptable how quickly does the customer require the plug?
- (e) Is the customer aware that EST Field Services is capable of providing on-site testing services?



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**High Lift Flange Weld Test Plugs.**

- (b) Flange size, class and applicable standard (e.g.: 3" 150 Lb Class ANSI, or 4" 600 Lb SC80 JPI). If the flange has been manufactured to a standard other than ANSI, DIN or JPI please provide a copy of the applicable standard.
- (c) If the application is for 600LB Class flanges or higher, what is the actual test pressure required?
- (d) Pipe size and schedule of the pipe to which the flange is (or is to be) welded.
- (e) If the flange is welded to something other than a length of pipe such as a nozzle, tee or elbow please provide a dimensioned sketch of the application.
- (f) If the required plug size is greater than 12" or for pipe sizes other than SC40 and SC80 then delivery may run in excess of 3-4 weeks (15-20 business days) from receipt of order, if this not acceptable how quickly does the customer require the plug?
- (g) Is the customer aware that EST Field Services is capable of providing on-site testing services?

**Special Test Plugs and Products**

All special products/application quotes must be generated through the Engineering department. **With all requests, a drawing or sketch is required showing the fitting and/or application.** If it is not possible to acquire this information, a sample of the fitting and / or pipe should be supplied if practical. There are times when all information can just not be obtained or the application is BASIC enough that in some cases a full blown drawing and/or sketch is really not necessary, however, every attempt should be made to procure it at time of initial request.

Additional pertinent information should also be supplied at that time. Depending on application/product, this can include but is not limited to:

- (a) Pipe/Tube/Test piece material and applicable material specifications
- (b) Pipe/Tube (OD, ID and wall thickness), or test piece ID
- (c) Test piece dimensional information including tolerances on fittings
- (d) Fluid medium (test media)
- (e) Test pressure requirements/testing parameters (air/hydro/mechanical)
- (f) Installation limitations (e.g. the distance to obstructions that might prevent, limit or restrict the plug from fitting into or onto the test piece; can the plug can stick past the end of fitting or into the bore; can it expand beyond the end of the fitting; are there any obstructions limiting the depth the plug can be inserted, etc.)
- (g) Finish requirements for the plug, if any (e.g. unfinished, painted, zinc plated, chrome plated, stainless steel, etc.)
- (h) What exactly are they testing, where does the need the seal, etc.)
- (i) Is the installation vertical or horizontal; if vertical is it top or bottom opening?
- (j) Is the installation underwater, underground, etc?
- (k) Operating temperature requirements (Shellside and Tubeside temperatures for Pop-A-Plugs)
- (l) Pipe / Tube preparation (Are tubes rolled, welded or both; what is tube sheet thickness, include tube for Stabilizer applications)
- (m) Will plugs be exposed to Sea water/Brackish water service?
- (n) How many plugs do they want - *this is imperative as ALL specials are very quantity sensitive.*
- (o) What is the required delivery (on-site) date? This impacts pricing as it can determine whether or not we accrue vendor expediting charges, break into machine runs, run multiple set-ups, whether or not raw materials can be procured in time, and testing of final product?
- (p) Are they a new customer?
  - a. What type of plugs or products are the using now? Depending on this and who we are competing against, this can impact the pricing as we are always looking to break into new areas.
- (q) Are they looking for a way to speed the testing or installation process, or ease installation, etc.
- (r) What is the potential Sales value, is this a one time deal, possible consistent order quantities over months or years, etc.
- (s) What Quality Assurance requirements will be invoked?



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