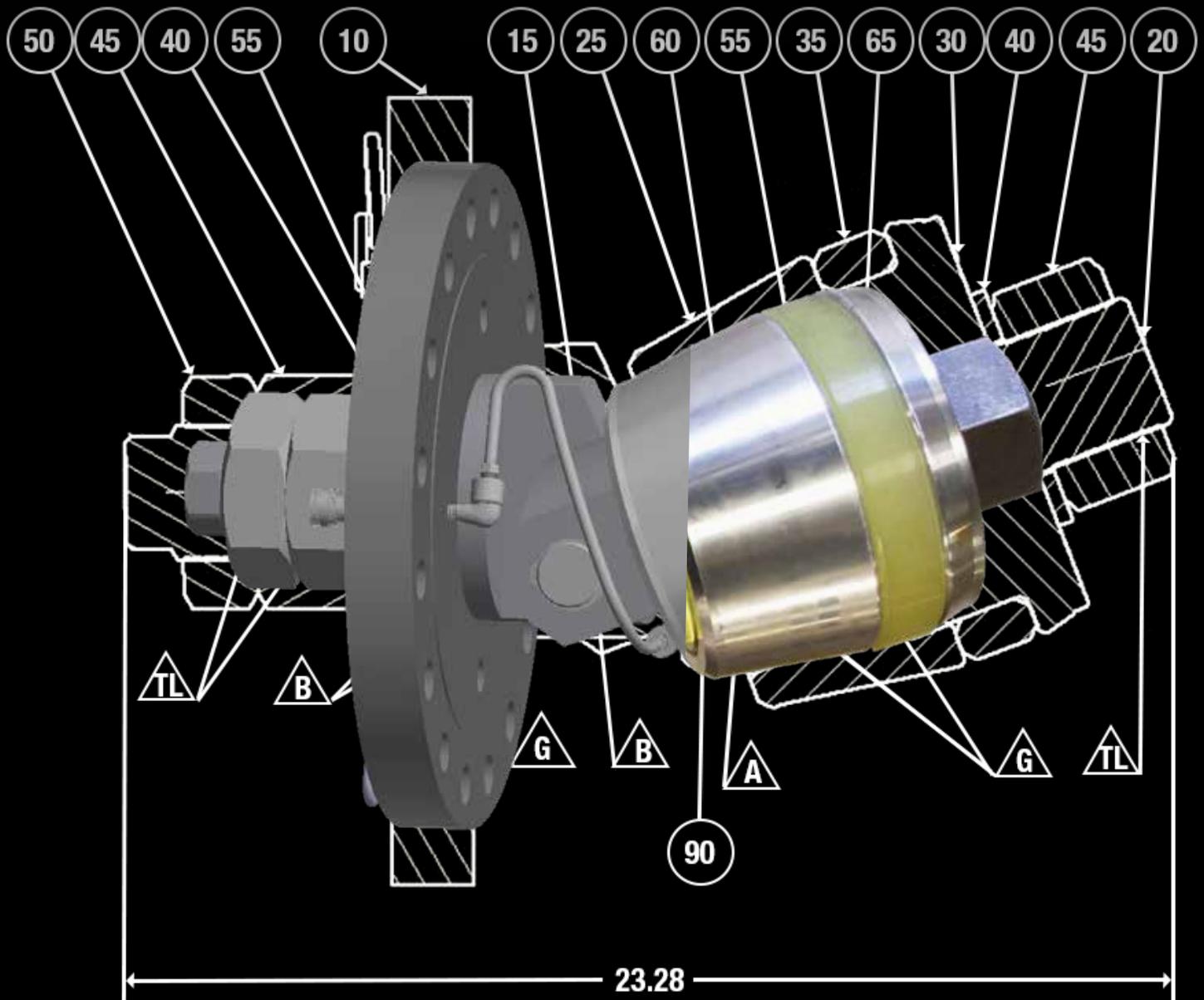


EST Group's Custom Product Solutions Team

Optimizing Operations with Customized Critical Process Solutions





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Process-intensive industries, from refining and power to petrochemicals and fertilizers, all rely on heat exchangers and pressure vessels as critical components of their daily operations. Leaks in this equipment can lead to crippling downtime and cost a plant operator hundreds of thousands to millions of dollars in lost revenue.

Increasingly, operators face unique processing challenges requiring solutions that are not available straight off the shelf. In addition, they do not have the luxury of waiting weeks or months for a customized product to be engineered, tested, manufactured, shipped, and installed.

EST Group's Custom Product Solutions Team was created specifically for these situations. Drawing on extensive application expertise across industries, the team works with customers to develop, design, and deliver a custom product—many times in just days. Customers get their problems resolved quickly, safely, and reliably—and get their plant's equipment and processes up and running with minimal downtime.

A Structured and Speedy Solutions Approach

The Custom Product Solutions Team's approach is unique in its level of service and unprecedented response time. Through a highly coordinated effort, the team ensures that customer needs are addressed and resolved as efficiently and cost-effectively as possible.

The team aims to deliver a proposal for the recommended solution to the customer within four hours after receiving the initial request. The clock starts ticking when the customer contacts their sales representative with an application request.

A refinery in Qatar required a special Pop-A-Plug tube plug to help bring a process-critical heat exchanger back online. The refiner requested the plug be made of a special metallurgy and size that was not part of EST Group's routine inventory—in fact, the plug had never been made in the size or from the materials requested.

With the refinery out of operation and losing hundreds of thousands of dollars in revenue by the day, the Custom Product Solutions Team worked around-the-clock to deliver a solution. The local EST Group sales rep drew on their application knowledge to collect all the specific system information—such as the required size and metallurgy, operating temperature, and pressure—that would be required to develop the right solution.

This information was passed to EST Group's Applications Engineering Team, who analyzed the problem, developed a proposed solution, and created a manufacturing proposal complete with customized specs and engineered drawings—all within three hours. The sales rep used this information in an official quote that was delivered back to the Qatari refiner within four hours of the call that kicked off the process.

The refiner accepted the proposal and the Custom Product Solutions Team, which included dedicated members from engineering, quality control, supply chain, manufacturing, and testing worked around-the-clock to manufacture the plugs. The team also developed a detailed set of technical documentation and instructions to install and operate the new plugs.

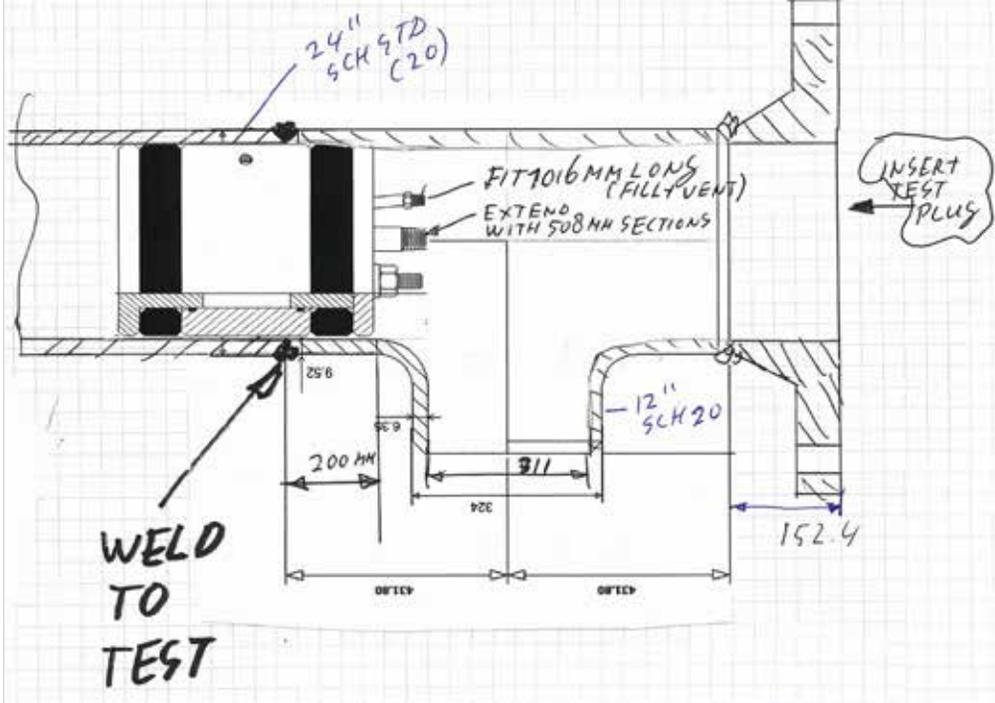
Each plug was manufactured to the customer's specifications within just a few days, tested to verify performance and transported via helicopter from the manufacturing plant to a charter plane waiting in New York. The plane flew two boxes of plugs, each weighing just a few pounds, to Qatar for successful installation. The transportation costs, while considered high under normal circumstances, were only one-tenth of a percent of the lost revenue the Qatari refiner experienced each day the plant was out of operation.

A typical timeframe to develop, manufacture, test, and ship a new product like these plugs might be six months or more. However, approximately 50% of the custom solution requests that EST Group receives—most of which are relatively minor adjustments or additions to existing equipment—are shipped to the customer within a day or two. While delivering custom solutions at this speed might be impossible for some, it has become almost commonplace for EST Group.

The Process in Action

The Custom Product Solutions Team has helped refineries, nuclear power plants, chemical processing facilities, and oil and gas operations around the globe solve unique challenges to bring their processes back to profitable operation. While many of the custom orders are developed and delivered within just a few days, more specialized products typically take longer.

For example, an operator of one of the world's deepest offshore production fields called on EST Group to help them hydrotest at 1,117 PsiG (77 BarG) the weld between a 24" (60.96 cm) Schedule 20 pipe and a reducer T piece using a 24" (60.96 cm) Double Block & Bleed (DBB) plug. Accessing the weld required removing a valve and piping to the right of a nearby flange and moving the plug horizontally approximately 32" (81.28 cm). This presented a challenge in that the 300-lb (136 kg), 11 1/2" (29.21 cm) -long plug would have to pass through the T piece that included a 12" (30.48 cm) reducer oriented vertically downward. The likelihood of getting the plug stuck in the reducer was too great and required a workaround.



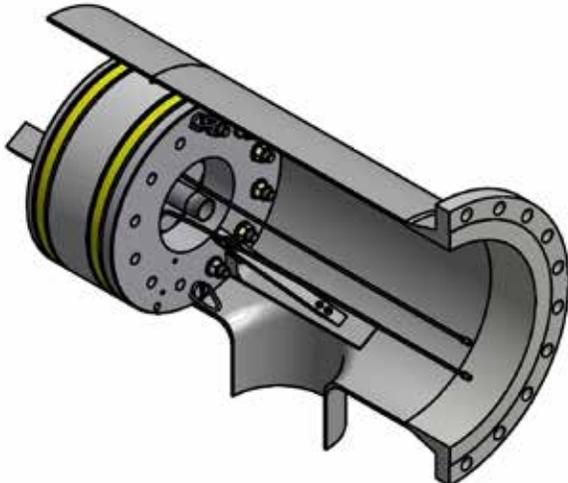
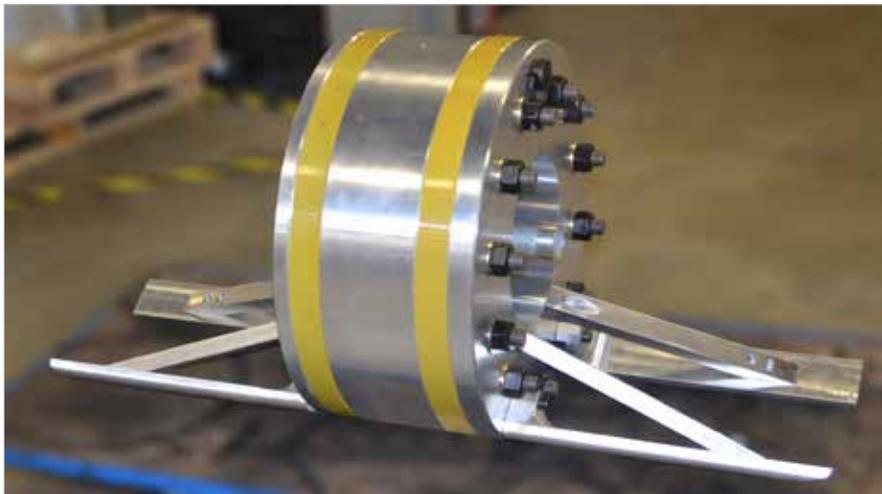
Schematic showing the vertical T section that posed an installation challenge for the DBB plug.

The Custom Product Solutions Team's engineers consulted with the operator to resolve this installation challenge. The first proposed solution was to develop a balancing arm and counterweight that could bolt onto the plug at the correct balancing point. The plug/counterweight assembly could then slide into place without getting lodged into the reducer opening. However, the combined weight of the plug and the counterbalance would be too great for the operator's rig and could damage the entire pipeline.

An engineer then proposed the concept of placing the plug on two sets of "skis" that could slide over the reducer opening and safely move the plug into place, with much less weight than the balancing arm. With the operator's approval, the engineering team went to work developing the ski-deployed plug, beginning with design iterations that included 3D CAD drawings and finite element analysis to model the stresses that were expected during deployment.

After reviewing the final design with the operator, the Custom Product Solutions Team manufactured, tested, and shipped the new plug-on-skis to the operator's field location. EST Group also deployed a team of field engineers to assist with the setup and ensure that the refiner did not incur any further delays. The plug installed easily and allowed the operator to successfully hydrotest the new pipe weld to the desired pressure.

Pleased with the results of this specially engineered plugging solution, the operator placed another request for a DBB-on-skis six months later—this time to hydrotest a 30" (76.2 cm) welded tie-in as part of a turnaround project.

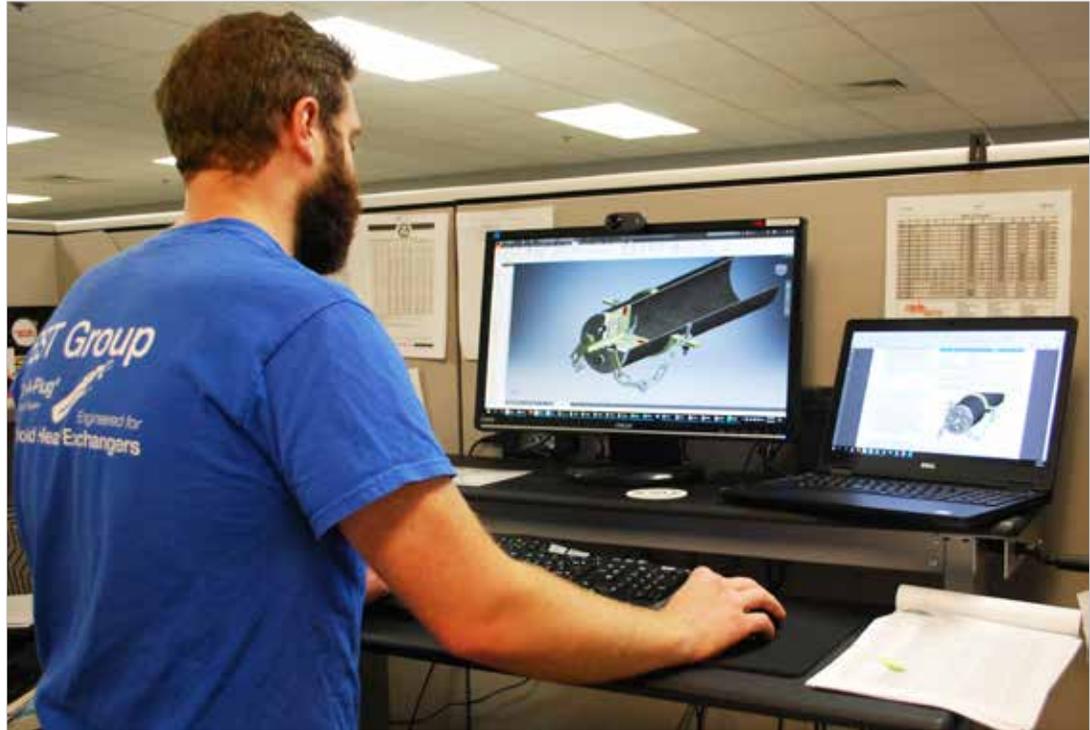


The Custom Product Solutions Team's DBB-on-skis installed easily without lodging in the reducer section. The weld area was quickly and effectively hydrotested to the desired pressure.

Building on Success

The Custom Product Solutions Team has achieved better than 99.7% on-time delivery rate, one of the highest in the industry. At the same time, the team continues to strive for improved customer satisfaction and product delivery on every project.

In line with this goal, the team incorporates lessons learned from every project, both the successes and the process missteps, with a goal to streamline processes and improve delivery times. Each new product developed becomes part of EST Group's growing inventory of products to solve new processing challenges and customer needs.



Application engineers quickly develop detailed product specs as part of the custom product proposal.

Looking ahead, Curtiss-Wright EST Group is not satisfied with solely servicing its legacy products. The company continually evolves by incorporating lessons from our custom products to develop pioneering technologies that help operators reach new levels of performance and profitability.

For more information, visit cw-estgroup.com. Contact us at est-info@curtisswright.com or +1 215.721.1100 / 800.355.7044 to speak with one of EST Group's Product Experts today!

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