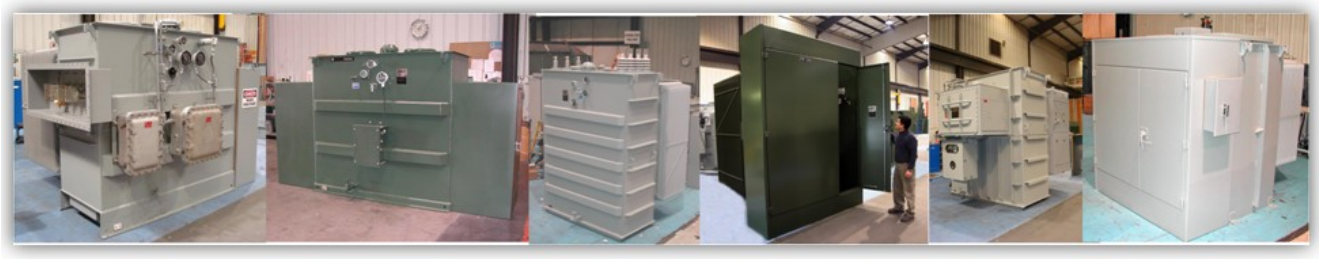
PACIFIC CREST
TRANSFORMERS

August 2013

Transformer Tank Construction



Pacific Crest Transformers is a leader in the design and construction of liquid filled distribution and power transformers with the flexibility to offer custom designs for pad mount, substation, station and specialty transformers.

A properly engineered transformer is designed to manage the specific load to which it is connected. The design parameters may vary based on the load profile. Although a good deal of attention is paid to the design and construction of the core/coil assembly, it is also essential that the element is housed in an enclosure suited for the application and environment in which the transformer is to be installed.

The transformer tank serves as the container for the insulating fluid while providing physical protection for the active part. It also provides the support structure for associated accessories and controls. Fluctuating loading results in internal tank pressure, and at times, vacuum which need to be accommodated to insure against deformations and the development of leaks.

Although PCT tank designs employ constants consistent with internal QC guidelines, each is designed to meet the specific requirements of the customer specifications.

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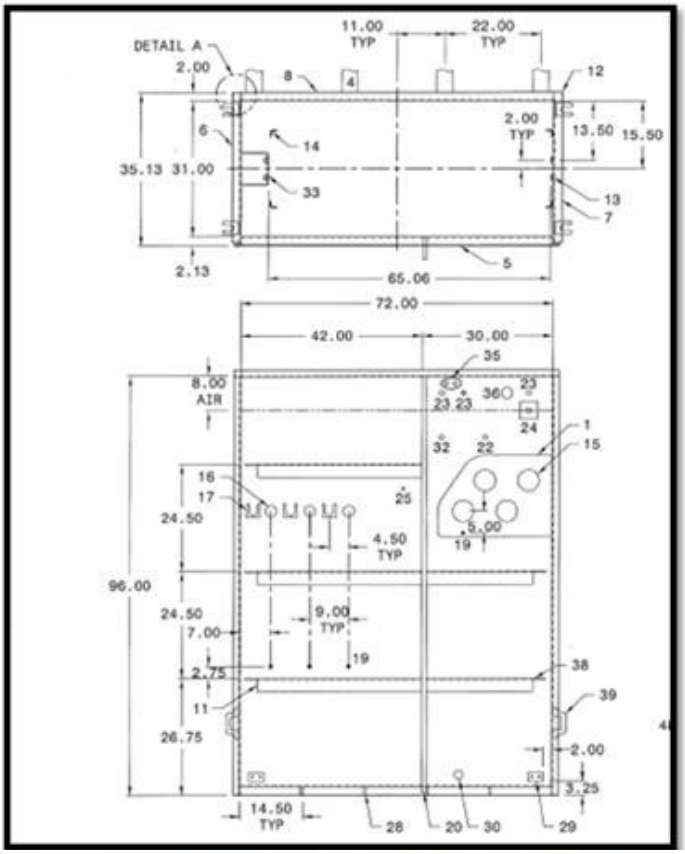
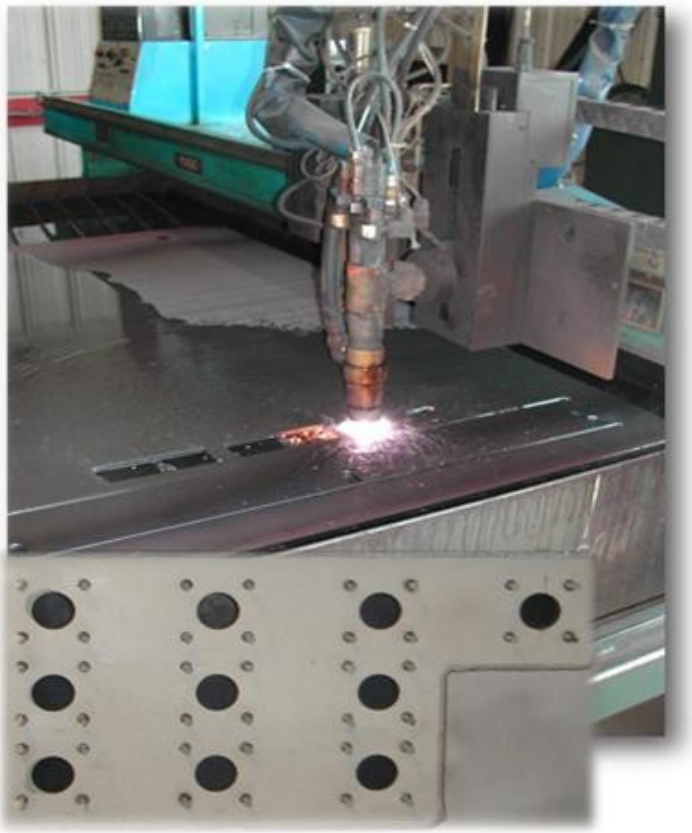
The process begins with the mechanical design created via a Computer Aided Design (CAD) program. After review and drawing approval, the data is transmitted by way of Computer Aided Manufacturing (CAM) software to the Computer Numeral Controlled (CNC) plasma cutter in the metal fabrication department.



Plasma cutting is a very productive way to cut sheet metal and plate. It has the advantages over traditional "metal against metal" cutting of producing no metal chips and giving accurate cuts while producing a cleaner edge than oxygen-fuel cutting. Utilizing CNC technology via a plasma cutter results in the production of tank components, complete with placement and dimensions of all tank wall cutouts. An added benefit is the ability to “nest” several orders together thereby enabling utilization of a higher percentage of each sheet of steel. The precision cutting coupled with job nesting results in optimization of raw material with minimal scrape.



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Once the plasma cutting process is completed, the parts/ pieces of each tank are organized and sent to a fabrication station. All assembly and welding is completed by certified welders. The process is controlled by strict quality control procedures. Close inspections are made to insure that the construction of each tank is in strict accordance to the specifications to which it was designed.

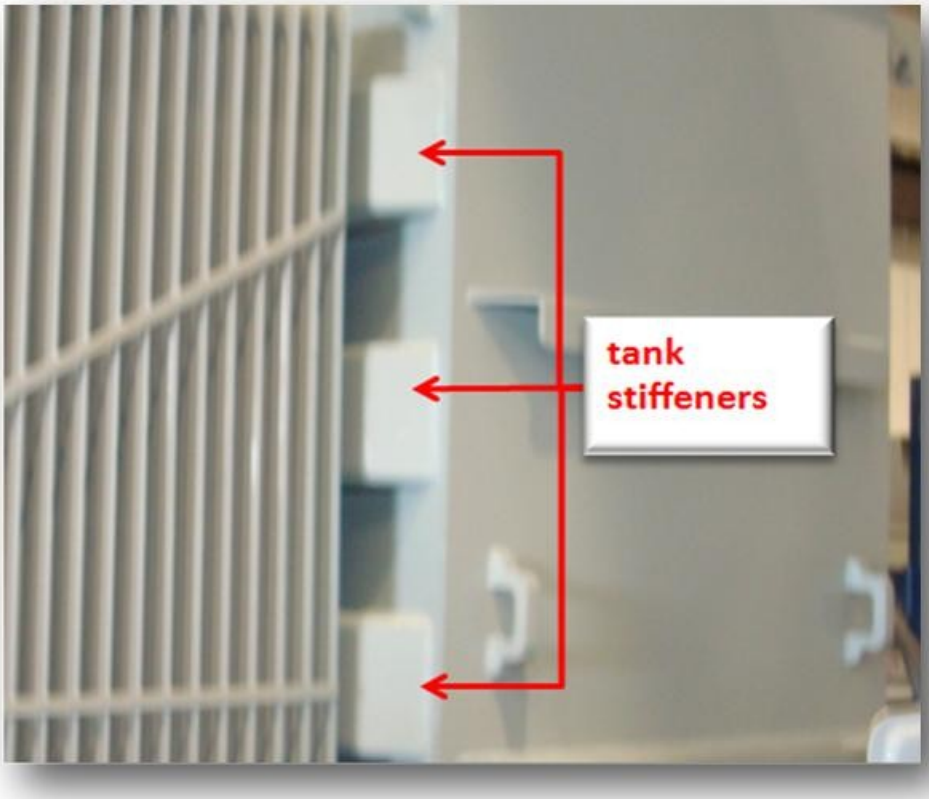
Once the initial welding process is completed, each tank is placed in a blast room. The blast operator working within the room applies a shot blast to all tank surfaces. This is an effective method for removing scale, rust, and minor surface flaws from the metal surfaces in preparation for painting.

Note the pictures to the right. The upper shows a tank prior to shot blasting. The process takes the metal surfaces down to “white metal” free of all contaminants as depicted in the lower photo. The surface texture is rough to the touch providing a proper surface for applying paint with excellent adhesion characteristics.

The above photo depicts a core/coil assembly being readied for tanking. Note that all tanks receive an initial coat of paint immediately after shot blasting to guard against flash rusting and to insure proper paint adhesion. Note also that the element core frame has been shot blasted but is not painted. Oxidation and/or rusting is not an issue here since the core/coil assembly will be totally immersed in insulating fluid immediately after being tanked. A final coat of paint is applied after each transformer has passed electrical testing and has had its covered welded on.

PCT prides itself in designing and constructing transformers that are specific for their intended installations. Although internal quality procedures set basic design parameters, each order can be adjusted to insure that the finished product is optimized for the load and environment in which it is to be used.

All tank walls are constructed with plate steel exceeding requirements set by ANSI standards thereby insuring total manage-ment of internal pressure and vacuum forces. In addition, tank stiffeners are added to further mitigate deformation forces. All radiator banks are integral or welded header type which provides the opportunity for the addition of tank stiffeners behind radiator panels.



By controlling deformation of the tank surfaces, weld seam stresses are eliminated as are the areas surrounding gasketed surfaces. Management of tank stresses equates to a reduction in the possibility of loss of the tank seal, which in turn insures that the transformer dielectric system is reliably maintained.

Pacific Crest Transformers: Providing innovative solutions for today's complex challenges