

U-2 GENERAL

(a) The user or his designated agent shall establish the design requirements for pressure vessels, taking into consideration factors associated with normal operation, such other conditions as startup and shutdown, and abnormal conditions which may become a governing design considerations (see UG-22).

UG-22 LOADINGS

The loadings to be considered in designing a vessel shall include those from:

- (a) internal or external design pressure;*
- (b) weight of the vessel and normal contents under operating or test conditions (this includes additional pressure due to static head of liquids); (c) superimposed static reactions from weight of attached equipment, such as motors, machinery, other vessels, piping, linings, and insulation;*
- (d) the attachment of:*
 - (1) internals;*
 - (2) vessel supports, such as lugs, rings, skirts, saddles, and legs;*
- (e) cyclic and dynamic reactions due to pressure or thermal variations, or from equipment mounted on a vessel, and mechanical loadings;*
- (f) wind, snow, and seismic reactions, where required;*
- (g) impact reactions such as those due to fluid shock;*
- (h) temperature gradients and differential thermal expansion;*
- (i) abnormal pressures, such as those caused by deflagration.*

All Hanson Pressure Vessels EXCEPT lined potable hot water storage tanks thru 160# wp are built and tested in accordance with the A.S.M.E. Boiler and Pressure Vessel Code Section VIII Division I for unfired pressure vessels and bear a "U" or "UM" stamp, National Board number and serial number, as required. (The "UM" stamp is on most vessels under 35 gallons). A copy of the A.S.M.E. data sheet U1-A, signed by an A.S.M.E. authorized inspector, will be sent with the invoice if requested at time of order.

Section 173.315(m) of Title 49 Code of Federal Regulations (CFR) states that a nurse tank must meet the requirements of the edition of the ASME Code in effect at the time the cargo tank was manufactured and is marked with a "U" stamp. The ASME Code establishes design and construction requirements for cargo tanks. In order to maintain the "U" stamp marking on the nurse tank, repairs that require welding must be performed in accordance with the National Board. The National Board requires welding on cargo tanks to be performed by facilities holding an "R" stamp.

BOILERS

The scope of ASME Code Section IV, Heating Boilers is:

Up to and including 15 psi (MAWP) steam and 160 psi (MAWP) and/or 250 degrees Fahrenheit for water. If the vessel exceeds any of these parameters then you must go to ASME Code, Section I, if the vessel meets the definition of a boiler.

"Boiler" means a closed pressure vessel in which a fluid is heated for use external to itself by the direct application of heat resulting from the combustion of fuel, solid, liquid, or gaseous, or by the use of electricity or nuclear energy.

We have a U stamp and we were given a project with a 6000 gallon horizontal demin water tank that is to have a design pressure of 300 psig and it will have a 275 KW heater installed to raise the temperature to below saturation temperature. The hot water will be continuously pumped out at a low rate of flow and fresh water will be allowed in to maintain level. I was concerned that the tank may be considered a boiler requiring a stamp other than the U stamp. In searching through Section VIII I do not see what the limitations are for a U stamp. Does 275 KW require something other than a U stamp?

The design pressure 300 psi puts this vessel out of ASME Code, Section IV, heating boilers.

What you have is an ASME Code, Section I, electric boiler falling under PEB-3. You will need a "S" stamp holder to certify this vessel. You will have to have a Master Data Report P-2A for the electric boiler with the words "Boiler pressure vessel constructed to Section VIII, Division I as permitted by Part PEB". The vessel will be stamped "U" and the letters "UB" and documented on the U-1 or U-1A Data Report.