

When is a heated vessel a Pressure Vessel?

Many industries require electric heating of various fluids, either liquids or gases as a normal part of their processes. What

are often not fully understood are the regulatory implications for suppliers, owners and operators of this heating equipment. This is especially so when it relates to the potential dangers of heated fluids within closed vessels, and when they become “Pressure Vessels”.



This article seeks to provide some guidance for owners and operators of heated vessels so they are in a position to ask the right questions of their suppliers to protect themselves, their employees and their employer.

Grimwood Heating Pty Ltd are a manufacturer of electric heating products based in Villawood, NSW. The product range extends from certified hazardous area heater and control systems for the Oil and Gas Industry through to replacement elements for domestic appliances.

As a result of the exposure to the strict requirements for the Oil and Gas Industry, Grimwood has developed an understanding of the application of the Australian Standards as they relate to Pressure Vessels.

Let us look at a typical example of how one can get into some bother without realising it;

Suppose we have a DN350 heater and vessel with a design pressure of 1.5MPa and volume of 200L. Water is being pumped through the heater and delivered to a heating jacket to maintain a certain system temperature down the line. If the initial design results in the required service temperature of the water to be 85°C, then the fluid is regarded as a non-harmful liquid [Hazard Level E]. However, what if it was discovered that the predicted losses were underestimated in the initial design and that a service temperature of 95°C is required? Now, the fluid is regarded as a harmful liquid [Hazard Level C]. If a similar scenario occurred but the required service temperature was determined to be 105°C, then the fluid would be regarded as a harmful gas [Hazard Level B].





This example shows how a simple change in service temperature can affect compliance with hazard levels. The difference between one hazard level and another may be as little as one degree and the increase may not necessarily be an increase of only one hazard level.

Assessing this in accordance with AS4343-2005 (and making some assumptions about the design for simplicity) it turns out to be either a hazard level B, C, D or E depending on a those assumptions. Well, this is no problem if it is a C or D (small pressure equipment or equipment with low hazard contents) or E (negligible-hazard pressure equipment), but if it turns out to be a B then it starts to get interesting. Now we really do need a pressure vessel complying with the requirements of AS1210 and the State regulations where the heater is installed!

Whenever you are considering a fluid heating application, always consult a supplier who understands how to apply these standards, or you risk spending money on equipment that not only may not comply with regulations, but could unnecessarily put your business and the public at risk.

Grimwood can provide a fully engineered solution complying with all the regulations you need to comply with, including the design registration of the pressure vessel in your jurisdiction.

This may result in a more expensive solution to your heating needs in terms of up-front costs. But, you know you won't be having any difficult conversations with your insurance company or the Occupational Health and Safety Regulator in your state.

Grimwood will insist on fully understanding your application before submitting a proposal to meet your needs. This way you can be assured that what you get is what you need, and it could be quite different to what you thought you wanted.

If you have a heating application, give us a call at Grimwood. First, we'll meet with you to define your project. Then, we'll submit a proposal for your evaluation. When the proposal is approved, we will assemble an experienced project team to design and build your heater. We will continue to work with you after we deliver your heater so you get the most value out of the product.



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