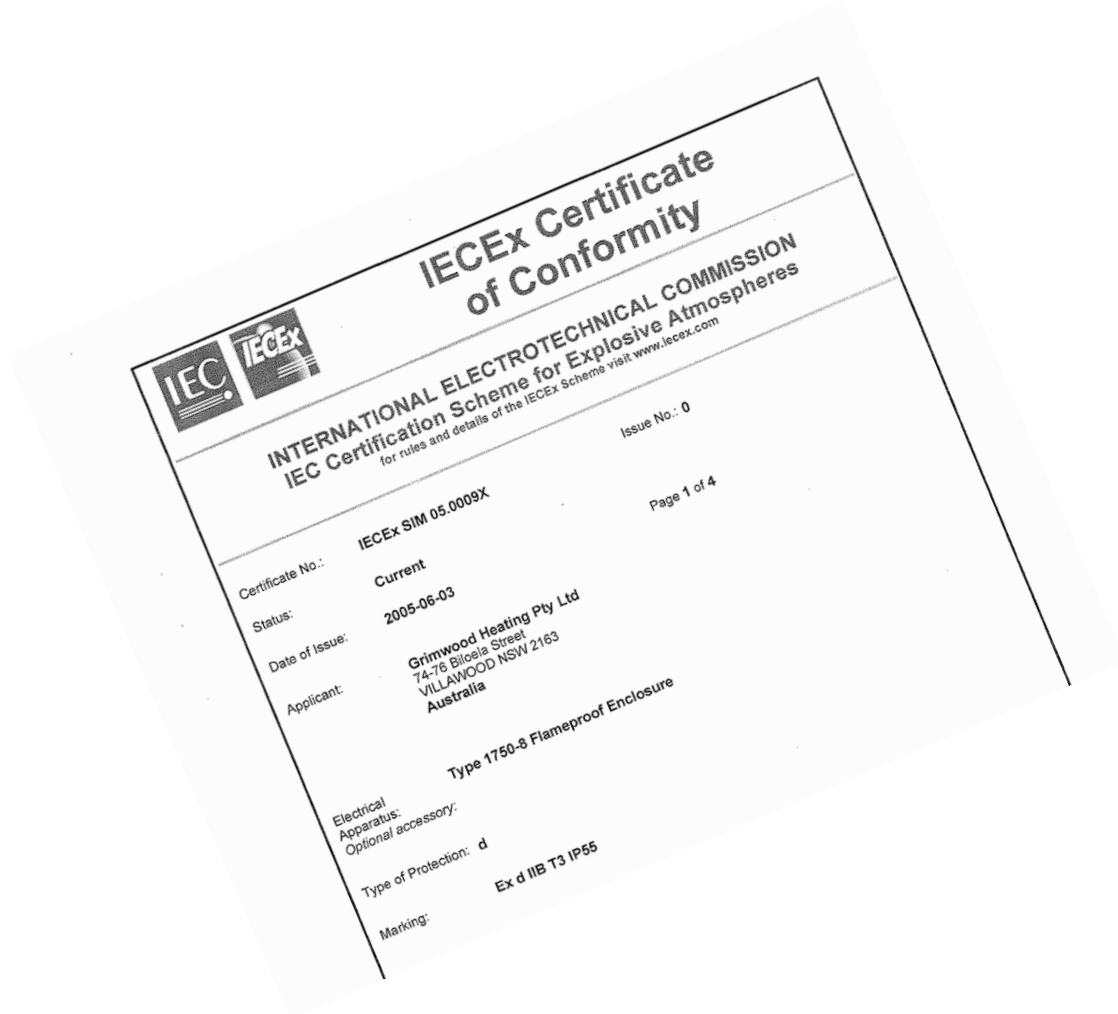




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## Hazardous Area Heating



*By Brian Walkington, Managing Director*

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## Introduction

The International Electrotechnical Commission (IEC) has established a scheme to facilitate international trade in electrical equipment intended for use in explosive atmospheres. This is known as the IECEx Scheme, and forms the basis of the current Australian and New Zealand Standards for hazardous area electrical equipment.

Grimwood Heating Pty Ltd is the first company in the world to be certified to manufacture electric heaters for hazardous areas in accordance with the IECEx scheme.

## Problem Statement

In many industries, ranging from off shore oil platforms, on site heavy fuel oil tank farms, food and beverage, pharmaceutical, through to paint and chemical works have locations designated as hazardous areas where explosive atmospheres may exist. It is important for the protection of the people who work in these areas, and for the protection of the equipment and surrounding facilities, that these are as safe as possible.

Until now there have been difficulties in meeting the requirements of the current Australian and New Zealand Standards for the appropriate level of protection in these areas as there was no one able to provide Hazardous Area Heating product certified to the IECEx Scheme.

There is a huge installed base of equipment that was built and commissioned in the last century in accordance with the standards as they existed then. Much of this equipment has deteriorated through normal wear and tear to the point where it no longer provides the level of protection required nor meets operational requirements due to burnt out elements or changed process parameters. It is not possible to repair or overhaul this equipment to bring it up to the required standard. This equipment must be

replaced to provide the users and owners with the protection and functionality required.

### **Previous Options**

Occupiers of premises with locations classified as hazardous areas had to do the best they could in finding heating equipment that came as close as possible to meeting the requirements of the Australian and New Zealand standards.

Generally equipment that met the European ATEX or other foreign certification requirements was accepted as being the best available compromise. This requires considerable engineering design input. In circumstances when the user needs to use ATEX, FM, CSA, UL or other Ex equipment not certified to the ANZEx/AUSEx or IECEx schemes, the equipment and its installation must provide an equivalent level of safety to the ANZEx/AUSEx or IECEx schemes. Also the user must obtain a Conformity Assessment document (CAD). The CAD provides evidence that a certificate of conformity to an alternative standard can be demonstrated to provide an equivalent level of safety to AS/NZS or IEC Standards. This normally requires a comparison of the relevant standards and verification that testing has been conducted by a third party. The legal owner must provide justification for the use of the equipment and document the acceptance in the hazardous area dossier. In some instances, there may be additional requirements for acceptance of apparatus certified to alternative standards (eg. Letters of No Objection in Victoria ).

### **The Grimwood Heating Pty Ltd Solution**

Grimwood Heating Pty Ltd are now certified under the IECEx scheme to

manufacture flameproof heaters in accordance with IEC standard 60079, which is identical to the Australian and New Zealand Standard.

#### *Benefit 1*

The first benefit of specifying a Grimwood certified IECEx heater for your hazardous area is providing your employees and others on your work site to the highest possible level of protection against a heater related accident.

#### *Benefit 2*

The second benefit is strict compliance with regulations.

#### *Benefit 3*

The third benefit is dealing with a local Australian owned company who can engineer and manufacture the product to meet your particular requirements.

Our professionally qualified engineers can visit your site and review the operational, control interface and other requirements to ensure you get the solution you need.

Sometimes the lack of simple process interlocks and controls can lead to premature failure of the heater. The picture below shows what happens without a low flow cut out.

The element sheath material of Alloy 800, has been overheated, and the blasted with cold process fluid, which has extruded the sheath material onto the leeward side of the element.



If the required design that has already been certified, delivery can often be completed in the time it would take to ship a non compliant unit from Europe. New designs requiring certification can be completed in three to four months, depending on the complexity of the application and the work load of the IECEx certifying body.

### **Implementation**

It is our experience that every application is different. The first step is determining how to protect your people, neighbours and assets is to accurately understand and specify the process parameters.

The end user must assess the location and environment where the heater is to be installed to determine the Zone, Apparatus Group, and Temperature Class which all influence the design and approval requirements of the heater.

The process parameters will influence the size of the heater, the internal heat transfer characteristics and materials of construction.

Grimwood can provide heaters up to 400kW utilizing ANSI B16.5 flanges from 6 inch (150NB) up to 14 inch (350NB) in classes 150, 300 and 600. Low temperature applications can be either carbon steel or stainless steel for marine, food and beverage industries and other corrosive atmospheres. Carbon steel heaters are blasted and finished with a solvent borne inorganic zinc silicate coating.



Higher operating temperatures require particular alloy steels to retain strength at elevated temperatures, and the terminal enclosure to be offset from the flange to minimize internal temperatures.

The heaters are supplied with a mandatory factory set and locked latching relay to prevent over temperature operation. If required, Grimwood can provide a third party full three phase thyristor power unit. These are available with three wire star or delta, four wire star with neutral and six wire open delta load configurations. These units easily interface with your plant PLC and SCADA systems.

### **Summary**

In summary, compliance with Australian and New Zealand Standards for hazardous area heating is now possible, utilizing a locally designed and manufactured product certified to the most stringent requirements in the world.

Acknowledgements;

Document review by [Jim Russell](#)  
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