

# Provision of fire emergency isolation for multilayer pipe in residential Class 1a buildings

## Gas Bulletin #57

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### Clause 5.2.11 Provision of fire emergency isolation for multilayer pipe.

Multilayer pipe installations are now required to be fitted with a system that shuts off the gas supply when there is a fire emergency. Multilayer pipe doesn't have the durability and mechanical strength of metallic piping when subjected to fire.

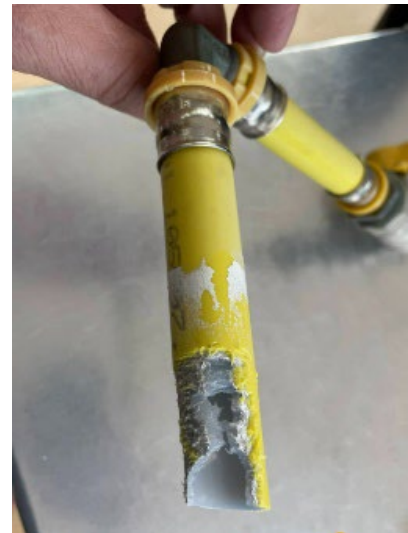
Technical Regulators around Australia and New Zealand have reported numerous house fires, where multilayer pipe has been installed, the structural integrity of the multilayer piping has been compromised releasing uncontrolled flow of gas, this additional fuel load raises the intensity of the fire increasing the risk further for the occupants and building structure.

Most house fires are not caused by a gas incident, however an ensuing fire whether it is caused by a gas incident or not will in most cases affect the structural integrity of multilayer pipe. Most European and American markets already require provision of fire emergency isolation for multilayer pipe for residential properties.



*Fire emergency incidents effecting the structural integrity of multilayer pipe leaving open ends allowing uncontrolled gas to escape.*





*Emergency shut of devices can isolate gas supply when other incidents occur like rodent attack or if the pipework has been accidentally cut.*

For residential Class 1a buildings in Australia where there is no fire safety system, a device is to be installed that will shut off the gas supply if the gas tightness is adversely affected by fire.

- Be installed in a readily accessible location
- Be installed prior to the multilayer piping (including underground multilayer piping)
- Be located as close as practical to the gas supply point
- Devices that sense pressure loss – under pressure shut off valve UPSO
- Devices that sense excessive gas flow conditions - excess flow valve EFV
- Electronic safety shut off system



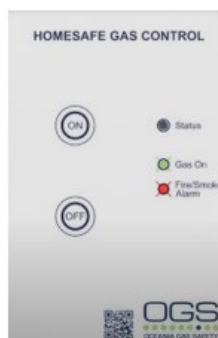
Maxitrol EFV



TECO EFV



UPSO



*Electronic safety shut off system.*



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**Note 1:** This clause also applies to the alteration of consumer piping using multilayer pipe in existing installation but does not apply to the replacement of a gas appliance in an existing installation.

**Note 2:** Some EFV have a maximum capacity operating range and not all valves will operate with a low inlet gas supply pressure, it is important you follow the manufacturers sizing guide to ensure the valve you intend to install is fit for purpose, additional valves may be required when sizing in accordance with the manufacturer's installation requirements. Fitting an incorrectly sized EFV will deem the installation non-compliant.

**Note 3:** Most UPSO devices are suitable for all inlet supply pressures, they are adjustable, must be set as per manufacturer's instruction and are manually reset after a under pressure event.

**Note 4:** Electronic system consists of a class 1 solenoid shut off valve, wired back to a relay panel or control device, connected to a compatible smoke detector. When smoke is detected, a signal is sent to the controller which shuts power to the solenoid causing it to close.

## Gas load conversion to cubic meters

- It is important to note that some of these valves are sized according to the amount of cubic meters they are expected to pass before shutting off.
- AS/NZS5601.1-2022 Appendix F Table F.1.5 Gas Properties states that the heating value (HV) of natural gas is 38 MJ/m<sup>3</sup> and for LPG it is 96MJ/m<sup>3</sup>.
- Therefore, if you had an installation with a continuous flow hot water heater rated at 198MJ/hr, a cook top rated at 40MJ/hr and a gas central heater rated at 120MJ/hr your total gas flow rate for the installation would be 358MJ/hr.

### Conversion example NG

Total installation gas load: 358MJ/hr

Heating value for NG is 38MJ/hr

To calculate MJ/hr to cubic meters: gas load ÷ by megajoule per hour = cubic meters

For example:  $358 \div 38 = 9.42\text{m}^3$

For this scenario you will be required to fit a device suitable for **10m<sup>3</sup>** installations

### Conversion example LPG

Total installation gas load: 358MJ/hr

Heating value for LPG is 96MJ/hr

To calculate MJ/hr to cubic meters: gas load ÷ by megajoule per hour = cubic meters

For example:  $358 \div 96 = 3.72\text{m}^3$

For this scenario you will be required to fit a device suitable for **4m<sup>3</sup>** installations

Remember:

- It is important to follow manufacturer's installation instructions
  - The devices should only be installed in the position and direction they have been designed to be installed in.
  - A correctly sized valve will eliminate nuisance tripping and avoid costly call outs.
  - Some pressure drop across the different devices can be expected and this should be considered when sizing the consumer piping.
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## Implementation

Due to the limited availability of excess flow valves in Australia the OTR has extended the mandatory compliance date for Clause 5.2.11 provision of fire emergency for isolation for multilayer pipe in residential Class 1a buildings to the **30<sup>th</sup> of June 2023**.

This extension only applies to Clause 5.2.11 provision of fire emergency for isolation for multilayer pipe in residential Class 1a buildings. All other means of conformance from the new AS/NZS5601.1-2022 including Clause 5.2.11 provision of fire emergency for isolation for multilayer pipe (non-residential Class 1a buildings) is mandated for the 31<sup>st</sup> of March 2023.

Provision of fire emergency for isolation for multilayer pipe in residential Class 1a buildings can be installed during the second stage installation or just prior to the gas supply is connected.

For all installations commencing after the 30<sup>th</sup> of June 2023 if provision of fire emergency for isolation for multilayer pipe in residential Class 1a buildings cannot be met other piping materials that don't require provision of fire emergency isolation will need to be considered for the installation (for e.g. copper or galvanised steel piping).

Contact the Office of the Technical Regulator for more information

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