Plumbing Practice Note GF-01: Allowable leakage rates for existing standard gas installations with a metering pressure of 1.13 kPA

This Practice Note specifies the requirements for an allowable leakage rate for existing standard natural gas installations where the metering pressure is nominally 1.13 kPa and the operating pressure is taken to be 1.7 kPa.

The context below provides guidance for:

- What are the different pressures used in gas installations?
- Allowable leakage in standard gas installations
- What measures should be taken to find a gas leak?
- When should existing gas installations be tested?
- What is the leakage rate for 'Other Gases and Pressures'?
- Is there an allowable pressure drop for an existing gas installation?
- Can I use a manometer to determine the leakage rate?

To clarify the position regarding allowable leakage, the Victorian Building Authority (VBA) in consultation with Energy Safe Victoria (ESV) has outlined the below requirements.

What are the different pressures used in standard gas installations?

The definitions and acronyms set out below are for guidance only. They are not intended to vary those set out in the Gas Safety Act 1997 and the Gas Safety (Gas Installation) Regulations 2018; the gas pressures are as follow.

- **Flowing Pressure** – is the pressure in the gas installation measured with appliances operating. The flowing pressure in a 'Standard' installation with a nominal metering pressure of 1.13 kPa, should not be less than 1.13 kPa at the inlet to any appliance.
- **Metering Pressure –** is the pressure of gas as it flows from the meter.
  Standard metering pressure is 1.13kPa, depending on the amount of gas flowing. Gas pressure can vary between 1.13 kPa and 1.3 kPa because of the slight variations in metering regulator settings.
- **Operating Pressure –** is the maximum pressure the gas installation will be subjected to under normal conditions.
  It is taken to be the pressure at which the meter regulator closes off the supply when gas is not flowing (otherwise known as lock-up pressure). The operating pressure should not exceed 1.7 kPa.

Allowable leakage in standard gas installations

As per AS/NZS 5601.1 all existing installations which have been altered, repaired, or extended must be tested for allowable leakage at their operating pressure.

An allowable leak test can only be used on an existing standard gas installation, and only relate to the use of natural gas, where the natural gas metering pressure is nominally 1.13 kPa with the operating pressure taken to be 1.7 kPa.

Note for gas installations operating at higher pressure, please refer to the section “Other gases and pressures”.

What measures should be taken to find a gas leak?

Gas leaks should be identified using a soapy water solution or leak detection fluid. However, in some circumstances slight leakage can occur which is hard to detect. Such leakage is often due to a combination of old appliances, worn gas cocks and slightly leaking pipe joints.

In these scenarios, a reasonable attempt to locate and fix the leak shall be made. Where reasonable attempts are made to locate any potential leaks and there is no smell of gas, an allowable leakage rate assessment can be made.

When should existing gas installations be tested?

All gas installations should be tested with the gas appliance still connected, and a gas leakage test should be carried out on all additions and alterations to an existing installation. If a leak is located, then plans must be made for the repair of the fault before any new work is connected. For further information regarding leakage testing, please refer to *AS/NZS 5601.1: Gas Installations.*

What is the leakage rate for ‘Other Gases and Pressures’?

For LPG or natural gas installations with a metering pressure or operating pressure of 2.75 kPa or above, there is **no allowable leakage rate**. You must ensure for gas installations, whether new or existing, there is no loss of pressure when tested to the requirements of AS/NZS 5601.

Is there an allowable pressure drop for an existing gas installation?

As per the requirements specified within the Energy Safe Victoria’s policy regarding allowable leakage rate, you must ensure:

- For any new installations, there must be no loss of pressure when tested to the requirements of AS/NZS 5601.1, Gas Installations. As a result, there is **NO** allowable leakage rate for any new installation.
- If there is a smell of gas or a reported smell of gas then the leak must be repaired and cannot be considered safe, even if the allowable pressure drop test is satisfactory.

- For standard existing installations, the installation may be deemed acceptable if the pressure drop, over a 5-minute period, does not exceed the pressure drop as stated in the 'Table 1' but must be related to the pipework volume.

- If the pressure drop is exceeded, then all faults **must** be located and rectified or otherwise the installation must be made safe by isolating the section of gas piping or the defective gas appliance.

E6 LEAKAGE TEST FOR EXISTING INSTALLATIONS

The leakage test for existing installations shall be carried out as follows:

a) Depressurize the installation
b) Ensure the installation is disconnected at the gas meter
c) Ensure all gas appliance pilots are turned off and all but the last control device (or tap) on each gas appliance is in the open position
d) Attach a suitable test instrument
e) Pressurize the installation to operating pressure. (1.7 kPa)
f) Isolate the pressure source and allow a suitable period (2 min) for the temperature of the testing medium within the consumer piping to stabilize.
g) Measure the loss of pressure during a test period of 5 min.

If the pressure loss is equal to or less than the maximum pressure drop specified below in Table 1, then the test is satisfactory.

If the pressure loss is greater than the maximum allowable pressure drop, the installation fails the leakage test and the consumer shall be advised so that remedial action can be taken to make the installation safe.

Table 1: E6 leakage test for existing installations, *referenced from AS/NZS 5601.1: Appendix E.*

Volume of pipework, L	Maximum Pressure drop, kPa
5	1.00
10	0.50
15	0.35
20	0.25
25	0.20
30	0.10

Table 2: Acceptable leakage drops, *referenced from AS/NZS 5601.1: Appendix E.*

Can I use a manometer to determine the leakage rate?

When determining the leakage rate a water U-tube manometer or calibrated differential pressure electronic manometer may be used.

Where an existing standard installation is supplied through a domestic-size meter (less than 6m³/hr capacity maximum) the leakage rate may be determined using a manometer. The test should be carried out with all appliances connected, and the gas meter disconnected from the fitting line, or alternatively the meter isolation valve tested for gas tightness, as a leaking property service isolation valve would not allow for an accurate test.
For other meter sizes, or where the meter is not located adjacent to the premises, calculating the leakage rate by manometer or by observing the meter test dial is not acceptable.

NOTE: There is NO allowable leakage rate for LPG installations or natural gas installations with a metering pressure or operating pressure of 2.75kPa or above.

Such installations, whether new or existing, must have no loss of pressure when tested to the requirements of AS/NZS 5601.1.

Related Documentation

- AS/NZS 5601.1: Gas installations Part 1: General installations
- ESV - Gas information sheet 04: Allowable leakage rate for Standard Installations operating at 1.13 kPa
- Practice Note GF-02: Type A Residential Cooking Appliances
- Practice Note GF-03: Natural Gas Type A Installations – Gas Heating Appliance Installed in a Roof

Contact Us

If you have a technical enquiry, please email plumbingtechnicalenquiry@vba.vic.gov.au or call 1300 815 127.

Victorian Building Authority
Goods Shed North
733 Bourke Street
Docklands VIC 3008

www.vba.vic.gov.au

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