

Gas Information Sheet No. 38

Checking Gas Appliances for Spillage Using Carbon Monoxide (CO) Detection Equipment

This information sheet, developed for gasfitters, provides guidelines for testing domestic gas appliances for carbon monoxide (CO) spillage using CO measuring equipment.

The sealing of buildings to achieve higher energy efficiency is impacting on the presence of adventitious openings required by open flued gas appliances to operate safely.

Australian Standards

AS 4553 Gas space heating appliances, AS 4556 Indirect gas-fired ducted air-heaters and AS 4558 Decorative gas log and other fuel effect appliances state:

There shall be no leakage or spillage of combustion products from an open flued appliance, its flue system, or draught diverter, 5 minutes after ignition when the appliance is operated at nominal gas consumption.

Furthermore:

Heaters shall be so constructed that there is no leakage of circulating air into the heat exchanger or of flue products into the circulating air system.

Carbon monoxide testing method

Always follow the manufacturer's instructions for the correct use of your testing equipment. Before testing ensure your equipment has been calibrated within the past 12 months using test gases that are NATA traceable or equivalent. Your equipment supplier should be able to assist you with this requirement.

Testing for CO gas spillage from open flued gas appliances must be carried out in two steps.

Step 1 Test for CO spillage with only the appliance operating.

Ensure the appliance and the flue are not heated before conducting this test. Some spillage will more than likely be evident when the flue is cold. It may take some minutes for the flue to draw properly.

Step 2 Test for negative pressure flue gas drawback when extraction fans are operating.

Carry out these tests in the order shown, otherwise you will not know whether the fault lies with the appliance installation or is caused by negative pressure when extraction fans are operating.

Open flued indoor gas appliances with fabricated flue systems

Step 1 Test for CO spillage with only the appliance operating

- Ensure all indoor gas appliances are turned off and not operating.
- Carry out a safety inspection of the appliance to be tested.
- Turn on your detection equipment and take a background reading in the room in which the appliance is situated. Note the CO reading. A background CO reading may be present due to other sources such as cookers.
- Light the gas and operate with the burner and appliance fan (if fitted) on the highest setting. Place the CO detection equipment sampling probe at all locations where leakage or spillage of combustion products can occur including the draught diverter relief openings, heat exchanger joints, flue connection and the base of flue product collection hoods.

When sampling at the draught diverter opening please ensure that the sampling probe is positioned adjacent to the opening and not inside the draught diverter.

Continue monitoring for leakage or spillage and in particular note the readings taken after the appliance has been operating for **5 minutes**.

The CO reading recorded after the appliance has been operating for 5 minutes should not exceed the background reading in the room.

Note: You may need to re-check the CO background level as it may have risen due to the initial spillage from the appliance at start up.

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If the CO reading exceeds the background CO level then the appliance is spilling and should be rendered safe.

Step 2 Test for negative pressure flue gas drawback

- a. If no spillage is detected in Step 1 then leave the appliance operating at maximum gas consumption and shut all windows and exterior doors and then turn on extraction fans, one at a time.
- b. After turning on each extraction fan, check for CO by passing the detection equipment sampling probe over the draught diverter relief openings.

If the CO reading detected is above the background level reading it will mean a negative pressure within the building has been created by the extraction fans and flue products are being drawn back down the flue and spilling into the room.

To prevent negative pressure developing increased ventilation from outside the building through walls, floors or ceiling space is required.

Open flued decorative effect gas log fires and space heaters using an existing chimney

Follow the same procedures as **Step 1 – Test for CO spillage with only the appliance operating.**

Note: There should be no spillage after **10 minutes** of operation as chimneys take longer to heat up (instead of the 5 minutes for fabricated flue systems).

The CO reading recorded after 10 minutes of operation should not exceed the background level taken in the room.

If there is no spillage then follow the same procedure as **Step 2 - Test for negative pressure flue gas drawback.**

Central heating units

Discharge of spillage from central heating units located outside the building, in the roof or under floor may in many cases go unnoticed. What may be found is CO being drawn into the building where the heat exchanger has cracked or seals within the combustion chamber have been damaged.

- a. If the appliance is an **open flued appliance** and installed indoors then follow the testing procedures for open flued gas appliances first.
- b. For all **central heater appliances**, note the background CO level. Operate the heater and place the detection equipment sampling probe in the air stream of a duct outlet (floor register or ceiling register). Monitor for CO for a further **10 minutes**.

If the CO level exceeds the background level then the appliance is leaking or spilling CO.

If any cracks or openings within the heat exchanger of the central heater are evident, combustion products that contain CO can be dispersed throughout the building. As the heat exchanger heats up and cracks and openings expand more combustion products can enter the supply air stream and flow into the building.

Room sealed space heaters

- a. Check the background CO levels.
- b. Operate the appliance for 10 minutes and then check for CO at the appliance.

Always check the lower levels of room sealed gas space heaters as these appliances may incorporate a condensate drain at the base of the heat exchanger and this could be an area where combustion products may discharge into the building. The CO level should not exceed the background level.

Further information

For further information please contact the Technical Information Line on 1800 652 563.