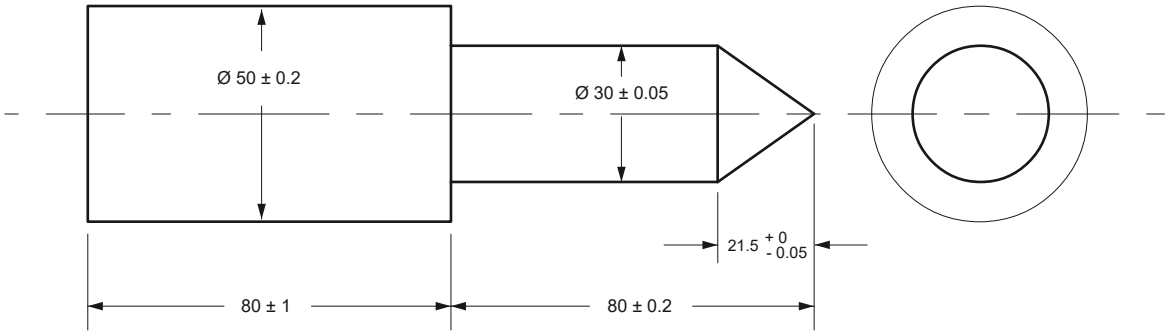

ALL DIMENSIONS IN MILLIMETRES

FIGURE A12 TEST CONE

APPENDIX B

METHODS OF TEST

(Normative)

B1 M.O.T. 2.1.22 (d) – 2001 GUARDS - FABRIC DRAPE TEST

B1.1 SCOPE

This test applies to all appliances fitted with a guard/s.

B1.2 METHOD

The appliance is operated at normal test gas pressure continuously for not less than 1 h at normal test gas pressure with the thermostat set at maximum, if fitted.

B1.3 APPARATUS

1 Equipment as specified in Clause 3.2.6.

2 Suitable timing device.

B1.4 MATERIALS

1 Supply of appropriate test gas (see Clause 3.1.2) at normal test gas pressure.

2 Electricity supply at the required voltage.

B1.5 PREPARATION OF APPARATUS

The appliance shall be installed/set up in accordance with the manufacturer's instructions.

B1.6 PROCEDURE

1 Operate the appliance continuously at maximum setting for not less than 1 h at normal test gas pressure with the thermostat set at maximum, if fitted.

2 A piece of dry bleached cotton flannelette 100 mm wide having a specific mass between 130 g/m^2 and 165 g/m^2, is held taut against the central part of the guard. The flannelette is held from the top to the bottom or, for guards in the horizontal plane, from the back to the front.

B1.7 RESULT

The appliance complies with this requirement provided the flannelette does not smoulder or ignite within 10 s.

NOTE: 'Smoulder' means burning slowly without flames. Blackening without smouldering is ignored. If smouldering has started, a hole will have formed in the material with its edge glowing red.

B2 M.O.T. 2.1.22 (e) – 2001 GUARDS – DETERMINATION OF INTEGRITY

B2.1 SCOPE

This test applies to all appliances fitted with a guard/s.

B2.2 METHOD

A specified tensile force is exerted on the guard in various directions to determine whether the guard can be removed, distorted, or displaced.

B2.3 APPARATUS

A spring balance with a capacity of not less than 2.5 kg.

B2.4 PREPARATION OF APPARATUS

The appliance shall be installed/set up in accordance with the manufacturer's instructions.

B2.5 PROCEDURE

1 Attach the spring balance to the centre of the guard.

2 Exert a pull of 20 N in various directions, i.e. with an indication of 2 kg on the spring balance.

3 Disconnect the spring balance.

4 Inspect for any damage or distortion.

5 Determine whether any permanent distortion affects compliance with Clause 2.1.22.

B2.6 RESULT

The appliance complies with this requirement provided the guard—

(a) does not become removed; and

(b) continues to meet the requirements of Clause 2.1.22.

B3 M.O.T. 2.2.6 (c) – 2001 ZINC ALLOY TEST

B3.1 SCOPE

This test applies to zinc alloys.

B3.2 METHOD

Three test samples are suspended above heated water for 10 d.

B3.3 APPARATUS

A chamber of suitable size to enclose the test samples suspended above a quantity of water heated to a temperature of 97±2°C. The water level shall be maintained automatically.

B3.4 PROCEDURE

1 The pressure in the chamber shall be maintained at atmospheric pressure via a water filled S trap.

2 Suspend the three samples above the water for 10 d.

B3.5 RESULT

The castings are deemed to have failed if they develop cracks, swell significantly or, in extreme cases, crumble. The presence of white rust on the surface of castings is not regarded as a failure.

A1

B4 M.O.T. 2.4.1.2 Part 1 deleted.

B5 M.O.T. 2.4.1.2 Part 2 deleted.

B6 M.O.T. 2.4.1.2 Part 3 deleted.

B7 M.O.T. 2.12.8 – 2001 MARKINGS AND LABELS

B7.1 SCOPE

These tests apply to all permanent markings and labels.

B7.2 METHOD

The legibility of all markings and labels is checked by rubbing with material soaked in water and kerosene before and after a heat soak test in an oven. The adhesion of self-adhesive labels is checked before and after the heat test and immersion in water.

B7.3 APPARATUS

1 Oven suitable for maintaining a temperature of 120ºC ±5ºC and 175ºC ±5ºC.

2 Water bath.

B7.4 MATERIALS

1 Water.

2 Kerosene.

3 Suitable material such as cotton or linen.

4 Samples of markings and labels, affixed to suitable backing plates e.g. enamelled steel, if of the self-adhesive type.

B7.5 PROCEDURE

1 Check self-adhesive labels for good adhesion and no lifting at edges.

2 Rub markings for 15 s with finger pressure applied to material soaked in water and check for legibility.

3 Rub markings for 15 s with finger pressure applied to material soaked in kerosene and check for legibility.

4 Place one sample of markings and label in an oven at a temperature of 120ºC (175ºC if the markings or label are to be in a hot zone e.g. close to the burner) for 72 h.

5 Remove samples from oven, allow to cool and check for adhesion and legibility as in Steps 1, 2 and 3.

6 Immerse one sample of markings and label in water for 24 h.

7 Remove sample from water, dry and check for adhesion and legibility as in Steps 1, 2 and 3.

B7.6 RESULT

The markings and self-adhesive labels comply with the requirements if good legibility of markings and adhesion of labels is obtained throughout the tests.

B8 M.O.T. 3.3.1 – 2001 GAS LEAKAGE

B8.1 SCOPE

This test applies to all fully assembled appliances.

B8.2 METHOD

The appliance is connected to a supply of air at 14.0 kPa pressure and any leakage is observed and measured.

B8.3 APPARATUS

1 Leak detector capable of measuring 1 mL/min with an accuracy of ±0.3 mL/min, e.g. bubble leak detector (see Figure A6), electronic leak detector.

2 A pressure gauge to measure up to at least 14.0 kPa with an accuracy of ±25 Pa.

B8.4 MATERIALS

A supply of air at 14.0 kPa pressure.

B8.5 PREPARATION OF APPARATUS

1 The appliance is prepared for testing in accordance with Clause 3.2.

2 The leak detector and its fittings are checked for gas tightness. If using a bubble leak detector, the correct water level is adjusted.

B8.6 PROCEDURE

1 Connect the leak detector to the inlet gas connection of the appliance.

2 Connect a pressure gauge to the pressure test point.

3 Close all control valves on the appliance and supply air at 14.0 kPa pressure to the inlet of the leak detector.

4 Open the pressure regulator valve and any safety shut off valve by heating the actuating element or by other means.

5 Allow approximately 1 min for pressures to stabilize.

6 If using a bubble leak detector, ensure cock ‘A’ is closed and cocks ‘B’ and ‘C’ are opened so that the air is directed through the dip tube (see Figure A6).

7 Check for leakage.

8 Systematically check for leakage up to and including each injector by opening each control valve in turn and sealing the injector orifice, including the pilot line.

B8.7 RESULT

The appliance complies with the requirement if the leakage rate does not exceed 1 mL/min at any time.

B9 M.O.T. 3.4.1/2 – 2001 GAS CONSUMPTION

B9.1 SCOPE

This test applies to all burners.

B9.2 METHOD

The appliance is supplied with the appropriate gas and the test point pressure is carefully set to the nominal value. The gas rate to all burners is measured accurately 15 min after ignition. It is necessary to obtain the dry relative density of the test gas, the gas temperature, and to note whether the gas is dry or saturated when passing through the gas meter, so that the corrected gas consumption can be calculated.

B9.3 APPARATUS

1 Equipment specified in Clause 3.2.6.

2 Suitable timing device.

B9.4 MATERIALS

Supply of appropriate test gas (see Clause 3.1.2).

B9.5 PREPARATION OF APPARATUS

1 The appliance shall be prepared for testing in accordance with Clause 3.2.

2 Supply the appropriate gas to the appliance.

3 Ensure that the meter is nominally at room temperature.

4 Ensure that the thermostat or any other temperature control device is rendered inoperative, e.g. by immersing the sensing element in cold water.

B9.6 PROCEDURE

1 Turn on the gas fully to all burners, light the gas and set the test point pressure to the nominal value. Operate the appliance for 15 min.

2 Measure the total gas rate in m^3/h within the next 2 min (see Clause 3.2.6). This is the value Qm, in the following calculation.

3 Determine the absolute temperature, Tm, of the gas passing through the meter.

4 Determine the gas pressure p in kPa (meter inlet pressure).

5 Determine the barometric pressure Pa in kPa.

6 Obtain the gas relative density Dt (Air = 1.000).

7 From these observations calculate the Determined Gas Consumption using the following formula:

$$R = Qm \cdot \frac{(Pa + p)}{Ps} \cdot Wr \cdot \left[Dt \cdot \frac{Ts}{Tm} \cdot \frac{(Ps + h)}{(Pa + h)} \right]^{1/2} \cdot \left[1 - \frac{Pw}{(Pa + h)} \cdot \left(1 - \frac{Dw}{Dt} \right) \right]^{1/2}$$

where

R = Determined Gas Consumption (MJ/h)

p = metering pressure (kPa)

Ps = standard absolute pressure (barometer) (101.325 kPa)

Pa = ambient absolute pressure (barometer) (kPa)

Wr = Wobbe index of reference gas

B9 M.O.T. 3.4.1/2 – 2001 GAS CONSUMPTION (Cont'd)

Dt = test gas relative density (dry)

Ts = standard absolute temperature - (273.15 + 15.0) (K)

Tm = meter absolute temperature (K)

h = injector pressure (nominal test point pressure) (kPa)

Pw = water vapour absolute pressure (partial press.) at Tm (kPa) (refer to Appendix D)

Dw = water vapour relative density (0.622)

NOTE: That the last term in the square brackets equals unity (1) for NG, TG and all dry gases. Table B1 gives Wr values (dry basis) for all reference gases.

TABLE B1

Wr VALUES (DRY BASIS) FOR ALL REFERENCE GASES

Reference gas	Wr
TG	26.0
TLP	23.8
NG	50.0
Propane	76.9
Butane	87.2

8 Turn off the main burner(s).

9 Repeat Steps 2 to 7 for any continuously burning pilot.

B9.7 RESULT

The appliance complies with these requirements if the determined gas consumption is:

(a) Within 5% of nominal gas consumption.

(b) Not more than 0.5 MJ/h for continuously burning pilots unless otherwise specified in Clause 3.4.2.

B10 M.O.T. 3.5.1 – 2001 GAS PRESSURE REGULATOR PERFORMANCE

B10.1 SCOPE

This test applies to all appliances supplied with gas pressure regulators including those incorporated in combination controls, except for LPG operated appliances.

B10.2 METHOD

A regulator reference setting is established, then the regulator outlet pressure is measured while the appliance inlet pressure is varied through the range specified; 1.13–5.0 kPa for NG appliances and 0.75–3.0 kPa for TG and TLP appliances.

B10.3 APPARATUS

Equipment specified in Clause 3.2.6.

B10.4 MATERIALS

Supply of appropriate test gas (See Clause 3.1.2).

B10.5 PREPARATION OF APPARATUS

1 The appliance shall be prepared for testing in accordance with Clause 3.2.

2 Identify and note the location of the manufacturer's specified pressure test point(s).

3 Ensure that the thermostat or any other variable restrictions in the gas line will not vary the gas flow-rate during the test, e.g. by immersing thermostat sensing element in cold water.

B10.6 PROCEDURE

1 Light all burners or as stated in the manufacturer's instructions.

2 Adjust appliance inlet pressure to normal test gas pressure (NG appliances 1.13 kPa, TG and TLP appliances 0.75 kPa).

3 For regulators that are intended to be adjusted, adjust regulator outlet pressure to the nominal test point pressure while maintaining the correct normal test gas pressure.

4 Turn off burners to stabilize regulator, then turn burners on again and note regulator outlet pressure.

5 If necessary, repeat Steps 3 and 4 until the regulator outlet setting can be reproduced within ±5% of nominal test point pressure.

6 If unable to obtain regulator outlet settings within ±5% of nominal test point pressure discontinue test.

7 Turn on all burners.

8 Increase the inlet gas pressure gradually to the maximum specified (5.0 kPa for NG appliances, 3.0 kPa for TG and TLP appliances) and record the test point pressure and inlet pressure at intervals no greater than 0.5 kPa.

9 Decrease the inlet gas pressure gradually to the normal test gas pressure (1.13 kPa for NG appliances, 0.75 kPa for TG and TLP appliances) and record the test point pressure and inlet pressure at intervals no greater than 0.5 kPa.

B10.7 RESULT

(a) Report the maximum variation of the test point pressure and corresponding inlet pressure(s) and the position of the pressure test point (e.g. on regulator, on gas manifold etc).

(b) The regulator complies with the requirement if the regulator outlet pressure does not vary from the nominal test point pressure by more than ±20%.