B2 M.O.T. 2.9.1 – 2003 MARKINGS AND LABELS

B2.1 SCOPE

These tests apply to all permanent markings and labels.

B2.2 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.

B2.3 APPARATUS

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

2 Water bath.

B2.4 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.

B2.5 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 120°C (175°C if the markings or label are to be in a hot zone e.g. the grill compartment or oven of a cooker) 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.

B2.6 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.

B3 M.O.T. 3.3.1 – 2003 GAS LEAKAGE

B3.1 SCOPE

This test applies to all fully assembled appliances.

B3.2 METHOD

The appliance is connected to a supply of air at the appropriate pressure and any leakage is observed and measured. The tests are carried out at ambient temperature and a pressure of 14 kPa upstream of the appliance.

B3.3 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 1), electronic leak detector.

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

B3.4 MATERIALS

1 A supply of air at 14.0 kPa pressure.

2 Suitable materials to seal injectors.

B3.5 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.

B3.6 PROCEDURE

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

2 Connect pressure gauges to the pressure test point and the inlet of the leak detector.

3 Seal all injectors, including pilot injectors.

4 Open the control valves and any safety shut off valve by heating the actuating element or by other means, to simulate the appliance being in operation.

5 Supply a pressure of 14.0 kPa to the inlet of the leak detector.

6 Allow approximately 1 min for pressures to stabilize.

7 Check and record the test point pressure.

8 If using a bubble leak detector, ensure valve ‘A’ is closed and valves ‘B’ and ‘C’ are opened so that the air is directed through the dip tube (see Figure 1).

9 Check for leakage.

10 If the pressure at the appliance test point in Step 7 was less than 14.0 kPa, repeat steps 4 to 9 using a pressure of 14.0 kPa at both the inlet and manifold of the appliance.

11 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.

12 At the conclusion of the durability test, repeat steps 1 to 11.

B3.7 RESULT

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

B4 M.O.T. 3.4.1/2/3 – 2004 GAS CONSUMPTION

B4.1 SCOPE

This test applies to all burners.

B4.2 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. When gas is used, it is necessary to obtain its heating value, relative density and temperature so that the correct gas consumption may be calculated.

B4.3 APPARATUS

1 Equipment as specified in Clause 3.2.6.

2 Suitable timing device.

B4.4 MATERIALS

Supply of appropriate test gas (see Clause 3.1.2).

B4.5 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 at normal test gas pressure.

3 Ensure that the meter is nominally at room temperature.

4 If test gas has been changed ensure meter is adequately purged.

5 For commercial ovens, ensure that the oven thermostat is rendered inoperative, e.g. by immersing the sensing element in cold water.

B4.6 PROCEDURE

1 Set the test point pressure according to manufacturer's instructions. If no instructions, turn on sufficient burners to equal approximately 50% of the total nominal gas consumption, and set the test point pressure to nominal.

2 Turn test burner(s) on. Operate the appliance for 15 min and measure the gas rate in m^3/h (see Clause 3.2.6) within the next 2 min. 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:

B4 M.O.T. 3.4.1/2/3 – 2003 GAS CONSUMPTION (Cont'd)

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

where

R is the determined gas consumption in MJ/h;

p is the metering pressure in kPa;

Ps is 101.325 kPa, the standard absolute atmospheric pressure;

Pa is the ambient absolute atmospheric pressure in kPa;

Wr is the Wobbe index of the reference gas in MJ/h;

Dt is the test gas relative density;

Ts is 288.15 K, standard absolute temperature;

Tm is the meter absolute temperature in K;

h is the injector pressure (nominal test point pressure) in kPa;

Pw is the water vapour absolute pressure (partial press.) at Tm in kPa (refer to Appendix E); and

Dw is 0.622, the water vapour relative density.

NOTE: The last term in the square brackets equals unity (1) for NG, TG and all dry gases. The following list gives Wr values for all reference gases:

TABLE B1

Wr VALUES (DRY BASIS) FOR ALL REFERENCE GASES

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

8 Where there is more than one independent burner, repeat Steps 1 to 7 for each independent burner in turn, including pilots.

9 Repeat Steps 1 to 7, with all burners turned on fully.

B4.7 RESULT

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

(a) Within 5% of nominal gas consumption for each burner.

(b) Within 20% of the sum of nominal gas consumption for all burners operating together.

(c) Not more than 0.5 MJ/h for continuously burning pilots unless otherwise specified in Clause 3.4.3.

B5 M.O.T. 3.5.1 – 2004 GAS PRESSURE REGULATOR PERFORMANCE

B5.1 SCOPE

This test applies to all appliances supplied with gas pressure regulators including those incorporated in combination controls.

B5.2 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, 0.75 – 3.0 kPa for TG and TLP appliances and 2.75 - 7.0 kPa for LPG appliances.

B5.3 APPARATUS

Equipment specified in Clause 3.2.6.

B5.4 MATERIALS

Supply of appropriate test gas (See Clause 3.1.2).

B5.5 PREPARATION OF APPARATUS

1 The appliance shall be prepared for testing in accordance with Clause 3.2.2.

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.

B5.6 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 and LPG appliances 2.75 kPa).

3 For regulators which 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 7.0 kPa for LPG 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 2.75 kPa for LPG appliances) and record the test point pressure and inlet pressure at intervals no greater than 0.5 kPa.

10 In the case of hotplates, turn off all burners except the smallest, set this burner at turndown and repeat steps 8 and 9.

B5 M.O.T. 3.5.1 – 2004 GAS PRESSURE REGULATOR PERFORMANCE (Cont'd)

B5.7 RESULT

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).

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

B6 M.O.T. 3.6 – 2003 TEMPERATURE HAZARDS

B6.1 SCOPE

This test is applicable to all appliances.

B6.2 METHOD

The appliance is operated under specified conditions and the temperatures of specified parts of the appliance and the surroundings are measured. For appliances with electric motors refer also to M.O.T 3.6.5.8.

B6.3 APPARATUS

1 Equipment as specified in Clause 3.2.6.

2 Test rig. This consists of a wooden floor with detachable side and back walls. The back wall shall be approximately 2 m high and the side wall shall be adjustable for height. The wood shall be 25 mm thick painted dull black, the floor being hardwood. 8 mm diameter holes shall be drilled from the back of the panels at no more than 75 mm centres on a grid pattern, to within 1.5 mm of the front surface. These holes must be flat bottomed. 24 AWG thermocouples are placed in the holes and bent at right angles to lie as flat as possible on the bottom of the holes. The point at which the wires first make electrical contact to form the junction shall be at least 4 mm from the bend. They shall be held in place by an electrically insulating cement. The thermocouples shall have an accuracy of ±2°C or better.

For built-in appliances an enclosure shall be constructed to fit the appliance as tightly as possible and fitted with thermocouples as described above.

All the thermocouple wires of one sign may be connected to one terminal of a switchboard, with each wire of the opposite sign connected to an individual terminal so that the temperature at any point may be selected by switching.

3 Small gauge thermocouples with an accuracy of ±2°C or better to be used on the boiling table surfaces.

4 Temperature recorder with an accuracy of ±2°C.

5 Ambient temperature recorder with an accuracy of ±2°C.

6 Suitable timing device.

B6.3.1 *Additional apparatus for boiling tables—Open and closed top, Chinese cooking tables*

Standard commercial vessels, see Clause 1.3.86.

B6.3.2 *Additional apparatus for fryers*

A water cooled heat exchanger which, when immersed in the cooking medium, is capable of removing heat at a sufficient rate to maintain the cooking medium temperature at 180°C ± 5°C while the burner(s) is operating at nominal gas consumption.

B6.4 MATERIALS

1 Supply of available gas at normal test gas pressure.

2 Where necessary, a supply of cold water.

B6.4.1 *Additional materials for barbecue grillers*

A perforated sheet metal plate of 25% free area to cover the entire open grill area (for open grill type only).

B6 M.O.T. 3.6 – 2003 TEMPERATURE HAZARDS (Cont'd)

B6.4.2 *Additional materials for fryers*

Cooking medium as specified by the manufacturer.

B6.5 PREPARATION OF APPARATUS

Install the appliance in the test rig, in accordance with the manufacturer's instructions, except that built-in appliances shall be installed as tightly as physically possible in a normal enclosure regardless of the clearances specified. Any clearances required shall be guaranteed by the fitting of clearance channels or spacers.

1 Connect the appliance to available gas.

2 Where required, add water or the cooking medium to the level specified in the instructions.

3 Set up the appliance in accordance with Clause 3.2.2.

4 Turn the gas off, and allow the appliance to cool.

B6.5.1 *Additional preparation of apparatus for barbecue grillers*

1 In the case of open type barbecue grillers, lay the perforated sheet metal plate of 25% free area centrally on the grill.

B6.5.2 *Additional preparation of apparatus for fryers*

1 Place a temperature measuring device 25 mm below the surface of the oil in the centre of each pan. Install a water cooled heat exchanger in each pan.

2 Adjust the cooking medium to the normal working level.

B6.6 PROCEDURE—BOILING TABLES—OPEN AND CLOSED TOP, CHINESE COOKING TABLES

1 Turn on gas and light burners, and operate the appliance at nominal gas consumption.

2 Place an open vessel containing 60 ±10 mm of water on each hotplate burner. These vessels shall be—

(a) a standard test vessel(s) (see Clause 1.3.86); or

(b) a wok(s); or

(c) a special purpose vessel(s) specified or supplied by the manufacturer; or

(d) a rectangular pan(s), when in position, that does not protrude over the edges and covers at least 85% of the area of the section of a solid hotplate.

3 Bring water to the boil and turn the burners down to simmer for the duration of the test. In the case of a wok maintain at full boil.

4 Top up water in vessels as necessary to maintain a depth of 60 ±10 mm.

5 Take temperatures after 2 h operation.

6 The appliance shall be kept operating while temperatures are being checked.

7 Measure floor temperature beneath, in front and at the sides of the appliance.

8 Measure the temperatures of the side and back walls.

9 Measure the temperatures of surfaces intended to be handled.

10 Measure the temperatures of surfaces likely to be accidentally touched.

11 Measure the temperatures of components, etc.

B6 M.O.T. 3.6 – 2003 TEMPERATURE HAZARDS (Cont'd)

12 Record the maximum temperatures attained during the test.

B6.7 PROCEDURE – SALAMANDERS, GRILLERS AND TOASTERS

1 Turn on the gas and light the burners.

2 Fill the grill tray to a quarter of its depth with water and operate the appliance at nominal gas consumption. Temperatures shall be taken after 2 h operation.

3 The appliance shall be kept operating while temperatures are being checked. Top up the water in the grill tray as necessary during the test.

4 Measure floor temperature beneath, in front and at the sides of the appliance.

5 Measure the temperatures of the side and back walls.

6 Measure the temperatures of surfaces intended to be handled.

7 Measure the temperatures of surfaces likely to be accidentally touched.

8 Measure the temperatures of components, etc.

9 Record the maximum temperatures attained during the test.

B6.8 PROCEDURE – SOLID GRILL PLATES AND GRIDDLES

1 Turn on the gas and light the burners.

2 Adjust the gas consumption to maintain the temperature of the plate at 200°C ±6°C.

3 Take temperatures after 2 h operation.

4 The appliance shall be kept operating while temperatures are being obtained.

5 Measure floor temperature beneath, in front and at the sides of the appliance.

6 Measure the temperatures of the side and back walls.

7 Measure the temperatures of surfaces intended to be handled.

8 Measure the temperatures of surfaces likely to be accidentally touched.

9 Measure the temperatures of components, etc.

10 Record the maximum temperatures attained during the test.

B6.9 PROCEDURE – BARBECUE GRILLERS

1 Turn on the gas and light the burners.

2 Operate the appliance at nominal gas consumption under the following conditions for 2 h—

(a) an open type appliance at full rate;

(b) a covered appliance at the maximum cooking condition specified by the manufacturer.

3 The appliance shall be kept operating while temperatures are being checked.

4 Measure floor temperature beneath, in front and at the sides of the appliance.

5 Measure the temperatures of the side and back walls.

6 Measure the temperatures of surfaces intended to be handled.

7 Measure the temperatures of surfaces likely to be accidentally touched.

8 Measure the temperatures of components, etc.

B6 M.O.T. 3.6 – 2003 TEMPERATURE HAZARDS (Cont'd)

9 Record the maximum temperatures attained during the test.

10 In the case of an appliance specified by the manufacturer for both open and covered cooking, successive tests shall be conducted in accordance with the operating conditions specified in Step 2 for each appliance type.

B6.10 PROCEDURE—OVENS

1 Turn on the gas and light the burners.

2 Set the thermostat to 260°C or maximum operating temperature, whichever is the lesser.

3 Take temperatures after 2 h operation.

4 The appliance shall be kept operating while temperatures are being checked.

5 Measure floor temperature beneath, in front and at the sides of the appliance.

6 Measure the temperatures of the side and back walls.

7 Measure the temperatures of surfaces intended to be handled.

8 Measure the temperatures of surfaces likely to be accidentally touched.

9 Measure the temperatures of components, etc.

10 Record the maximum temperatures attained during the test.

B6.11 PROCEDURE—BOILING WATER UNITS, STOCKPOTS, BRAT PANS, ATMOSPHERIC STEAMERS AND PASTA COOKERS

1 Fill with water to the normal operating level.

2 Turn on the gas and light the burners.

3 Operate until the water boils, then reduce the gas consumption to the minimum which will maintain boiling and continue for 30 min.

4 The appliance shall be kept operating while temperatures are being checked.

5 Measure floor temperature beneath, in front and at the sides of the appliance.

6 Measure the temperatures of the side and back walls.

7 Measure the temperatures of surfaces intended to be handled.

8 Measure the temperatures of surfaces likely to be accidentally touched.

9 Measure the temperatures of components, etc.

10 Measure the temperatures of any surface likely to come into contact with frying oil.

11 Record the maximum temperatures attained during the test.

B6.12 PROCEDURE—FRYERS

1 Confirm cooking medium is at the normal operating level with the heat exchanger in position.

2 Light the gas and set the thermostat to maximum temperature setting.

3 Start a small flow of water through the heat exchanger(s) and increase the flow when the temperature of the medium approaches 180ºC.

4 By adjusting the water flow and if necessary the depth of immersion of the heat exchanger, maintain the cooking medium temperature at 180ºC ±5ºC throughout the test.