

American National Standard/
CSA Standard for
Gas Clothes Dryers

Volume I, Type I Clothes Dryers



AMERICAN NATIONAL STANDARD
ANSI Z21.5.1-2006

CSA STANDARD
CSA 7.1-2006

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Gas Clothes Dryers
Volume I, Type I Clothes Dryers
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10036***

Preface

This publication represents a basic standard for safe operation, substantial and durable construction, and acceptable performance of gas type 1 clothes dryers. It is the result of years of experience in the manufacture, testing, installation, maintenance, inspection and research on gas clothes dryers designed for utilization of gas. There are risks of injury to persons inherent in appliances that, if completely eliminated, would defeat the utility of the appliance. The provisions in this standard are intended to help reduce such risks while retaining the normal operation of the appliance.

Nothing in this standard is to be considered in any way as indicating a measure of quality beyond compliance with the provisions it contains. It is designed to allow compliance of type 1 gas clothes dryers, the safety construction and performance of which may exceed the various provisions specified herein. In its preparation, recognition has been given to possibilities of improvement through ingenuity of design. As progress takes place, revisions may become necessary. When they are believed desirable, recommendations or suggestions should be forwarded to the Program Manager, Standards Committee Z21/83, 8501 East Pleasant Valley Road, Cleveland, Ohio 44131, or the Chairman of CSA Technical Committee on Gas Appliances and Related Accessories, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.

Safe and satisfactory operation of type 1 gas clothes dryer depends to a great extent upon its proper installation, use and maintenance. It should be installed, as applicable, in accordance with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*; the *Natural Gas and Propane Installation Code, CSA B149.1*.

Users of this American National Standard/CSA Standard are advised that the devices, products and activities within its scope may be subject to regulation at the Federal, Territorial, Provincial, state or local level. Users are strongly urged to investigate this possibility through appropriate channels. In the event of a conflict with this standard, the Federal, Territorial, Provincial, state or local regulation should be followed.

THIS STANDARD IS INTENDED TO BE USED BY THE MANUFACTURING SECTOR AND BY THOSE APPLYING THE EQUIPMENT AND BY THOSE RESPONSIBLE FOR ITS PROPER INSTALLATION. IT IS THE RESPONSIBILITY OF THESE USERS TO DETERMINE THAT IN EACH CASE THIS STANDARD IS SUITABLE FOR AND APPLICABLE TO THE SPECIFIC USE THEY INTEND.

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EFFECTIVE DATE: An organization using this standard for product evaluation as a part of its certification program will normally establish the date by which all products certified by that organization should comply with this standard.

History Of The Development Of Standard For Gas Clothes Dryers Volume I, Type 1

(This History is informative and is not part of the standard.)

With the onset of the Free Trade Agreement between the United States and Canada on January 2, 1988, significant attention was given to the harmonization of the United States and Canadian safety standards addressing gas-fired equipment for residential, commercial and industrial applications. It was believed that the elimination of the differences between the standards would remove potential trade barriers and provide an atmosphere in which North American manufacturers could market more freely in the United States and Canada. The harmonization of these standards was also seen as a step toward harmonization with international standards.

Under an agreement between the Association of Home Appliance Manufacturers (AHAM) and International Approval Services (IAS), Canada Operations, a draft harmonized standard for Type 1 gas clothes dryers was prepared by IAS-Canada staff. On December 6, 1992 the Z21/CGA Joint Clothes Dryers Subcommittee reviewed the first draft harmonized Type 1 gas clothes dryer standard based on current coverage from the American National Standard for Gas Clothes Dryers Volume I, Type 1 Clothes Dryers, ANSI Z21.5.1-1992, and National Standard of Canada for Domestic Gas Clothes Dryers, CAN1-7.1-M85.

At its December 1992 meeting, the Z21/CGA Joint Clothes Dryer Subcommittee considered and modified the proposed harmonized draft and agreed to distribute it for industry review during August 1993.

With the formation of joint subcommittees, a Canadian Gas Association Standards Steering Committee on Gas Burning Appliances and Related Accessories was established to parallel Accredited Standards Committees Z21 and Z83, and to support the formation of joint subcommittees. Operating procedures, in accordance with American National Standards Institute procedures, for joint subcommittees were developed and subsequently approved by ANSI on April 1, 1993.

Following reconsideration and modification of the proposed draft standard for Type 1 gas clothes dryers, in light of comments received, the joint clothes dryers subcommittee, at its October 6, 1993 meeting, recommended the proposed draft to the Z21 Committee and the CGA Standards Steering Committee for approval.

The proposed draft of the harmonized standard for Type 1 gas clothes dryers, as modified by the joint subcommittee, was approved by the Z21 Committee by letter ballot dated December 22, 1993, and by the CGA Standards Steering Committee on April 29, 1994.

The first edition of the harmonized Z21/CGA Standard for Gas Clothes Dryers Volume I Type 1 Clothes dryers was approved by the Interprovincial Gas Advisory Council in February 1995 and by the American National Standards Institute, Inc., in April 1995.

The second edition of the harmonized Z21/CSA Standard for Gas Clothes Dryers, Volume I Type 1 Clothes Dryers was approved by the Interprovincial Gas Advisory Council on March 10, 1999 and by the American National Standards Institute, Inc., on April 30, 1999.

The third edition of the harmonized Z21/CSA Standard for Gas Clothes Dryers, Volume I Type 1 Clothes Dryers was approved by the Interprovincial Gas Advisory Council on February 7, 2002 and by the American National Standards Institute, Inc., on February 14, 2002.

This the fourth edition of the harmonized Z21/CSA Standard for Gas Clothes Dryers, Volume I Type 1 Clothes Dryers was approved by the Interprovincial Gas Advisory Council on December 1, 2006 and by the American National Standards Institute, Inc., on August 28, 2006.

The previous editions of the Volume I, Type 1 Clothes Dryers standard, and addenda thereto, approved by the American National Standards Institute, Inc., and the Interprovincial Gas Advisory Council, are as follows:

Z21.5.1-1995 • CGA 7.1-M95	Z21.5.1-1999 • CSA 7.1-M99	Z21.5.1-2002 • CSA 7.1-2002
Z21.5.1a-1996 • CGA 7.1a-M96	Z21.5.1a-1999 • CSA 7.1a-M99	Z21.5.1a-2003 • CSA 7.1a-2003
Z21.5.1b-1998 • CGA 7.1b-M98	Z21.5.1b-2001 • CSA 7.1b-M2001	Z21.5.1b-2005 • CSA 7.1b-2005

The following identifies the designation and year of the fourth edition of the standard:

Z21.5.1-2006 • CSA 7.1-2006

NOTE: This edition of Z21.5.1 • CSA 7.1 incorporates changes to the 2002 edition and addenda thereto. Changes, other than editorial, are denoted by a vertical line in the margin.

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American National Standard/ CSA Standard for Gas Clothes Dryers, Volume I, Type 1 Clothes Dryers

Part 1: Construction

1.1 Scope

1.1.1

This standard applies to newly produced Type 1 clothes dryers (see Part IV, Definitions), hereinafter referred to as dryers, constructed entirely of new, unused parts and materials:

- a. For use with natural gas;
- b. For use with manufactured gas;
- c. For use with mixed gas;
- d. For use with propane gas;
- e. For use with liquefied petroleum gases;
- f. For use with LP gas-air mixtures; and
- g. For mobile home installation (see [1.2.12](#)).

The construction of clothes dryers for use with the above-mentioned gases is covered under Part I.

The performance of clothes dryers for use with the above-mentioned gases is covered under Part II.

1.1.2

Exhibits A and B include coverage for electrical equipment, wiring and accessories built in or supplied for use with the dryer.

1.1.3

Exhibit A contains provisions that are unique to the United States.

1.1.4

Exhibit B contains provisions that are unique to Canada.

1.1.5

Special construction provisions applicable to a dryer designed for use with an optional listed conversion kit are outlined under Exhibit C, Optional Provisions for Listed Gas Appliances Conversion Kits.

1.1.6

If a value for measurement as given in this standard is followed by an equivalent value in other units, the first stated value is to be regarded as the specification.

1.1.7

All references to “psi” throughout this standard are to be considered gage pressures unless otherwise specified.

1.1.8

Exhibit D, List of Reference Standards, contains a list of Standards specifically referenced in this standard and sources from which they may be obtained. Exhibit D includes the U.S. and Canadian reference standards where applicable.

It is the responsibility of the user of this standard to determine which referenced standard applies, based on the requirements of the authority having jurisdiction at the location of the installation.

1.1.9

Special construction provisions applicable to a clothes dryer designed for use with an optional listed conversion kit are outlined under [Exhibit C, Optional Provisions for Listed Gas Appliance Conversion Kits](#). Also see [1.23.13](#).

1.2 General Construction

1.2.1

The construction of the dryer, whether specifically covered in this standard or not, shall be in accordance with reasonable concepts of safety, substantiality and durability.

All specifications as to construction set forth herein may be satisfied by the construction actually prescribed or such other construction as will provide at least equivalent performance.

A dryer submitted for examination under this standard shall comply with applicable operational tests specified in Part II (see [2.1.5](#)).

1.2.2

Every part of the dryer shall be of such construction as to be secure against displacement, distortion, warping or other damage, and shall be constructed so as to maintain a fixed relationship between essential parts under normal and reasonable conditions of handling and usage. Parts not permanently secured shall be designed so they cannot be improperly located when removed or replaced during cleaning or other servicing.

1.2.3

Asbestos shall not be used in the construction of a dryer.

1.2.4

The construction and assembly of the dryer shall be of a neat and workmanlike character with parts well fitted, and all bolts or other fasteners drawn up tightly to give rigidity.

1.2.5

Parts that could come in contact with the clothes to be dried or could be contacted by the operator during normal use, adjustment or servicing shall be free from sharp projections or edges and from projecting screw ends.

1.2.6

Fasteners for removable parts shall have a corrosion-resistant finish.

1.2.7

The design or construction of the dryer shall be such that the burner(s), controls and electrical equipment will not be affected by water during normal handling or operation of the dryer.

1.2.8

The dryer shall not tip under the following Method of Test.

Method of Test

a. The dryer shall not tip when the following load is suspended from the outer edge of an open door:

1. Door with horizontal hinge - 50 lb (22.7 kg); or
2. Door with vertical hinge - 35 lb (15.9 kg).

This test shall be conducted with all gas supply and exhaust piping disconnected.

b. A dryer equipped with means to permanently secure it to the structure maybe so secured for this test, provided:

1. The dryer bears a marking indicating it must be secured to the structure at the time of installation (see 1.23.6);
2. The installation instructions provided with the dryer specify that the securing means must be used (see 1.22.6); and
3. The securing means can be installed from the front of the dryer.

1.2.9

On belt-driven blowers or fans, means for adjusting or maintaining belt tension shall be provided.

1.2.10

The dryer shall be provided with an interlock which will be automatically actuated when the loading door is opened more than 3 in (76.2 mm) while the dryer is in its normal operating cycle. This interlock shall function both to stop the drum rotation and shut off the main burner gas supply within 10 seconds. When closing the loading door, this interlock shall not permit the drum to rotate or the main burner gas to turn on until (1) the door is closed to 3 in (76.2 mm) or less, and (2) a secondary function control, manually operated from outside the dryer, is actuated.

1.2.11

The dryer shall be provided with a means to permit leveling at installation. The leveling means shall have no sharp edges.

1.2.12

A dryer for mobile home installation shall include:

- a. Means available from the manufacturer for secure attachment of the dryer to the floor or wall.
- b. Marking to indicate that the dryer is suitable for mobile home installation (see 1.23.7).

1.3 Accessibility

Thermostats, orifices, burner ignition devices, burners and controls which may require cleaning, lubrication or adjustment in the field shall be readily accessible from the front of the dryer without disconnecting the dryer from the gas supply. No special tools shall be required for making adjustments. Removal of access panels is permissible.

1.4 Thickness Of Materials

1.4.1

Structural sheet-iron or steel parts, if unfinished and not in contact with flue gases, shall be at least 0.0195 in (0.495 mm) thick. Structural sheet-metal parts fabricated from corrosion-resistant metals or alloys, or structural sheet-steel or iron parts finished in porcelain enamel or otherwise finished, shall be equal to the strength and durability of 0.0195 in (0.495 mm) thick sheet steel, except that such sheet metal shall be at least 0.0152 in (0.386 mm) thick. Ornamental and finishing strips need not comply with this provision.

1.4.2

When sheet metal is exposed to flue gases, the thickness shall be such as to provide resistance to corrosion equivalent to 0.0304 in (0.772 mm) thick black sheet iron, except that sheet metal less than 0.0152 in (0.386 mm) thick shall not be used.

1.4.3

The construction of the dryer shall be able to support a load of 30 lb/ft² (148 kg/m²) of top area, uniformly applied over the entire top surface for a period of 5 minutes, without breakage or permanent damage to any part thereof or without permanent deformation in excess of 0.1 in (2.54 mm).

1.5 Burners

1.5.1

A main burner or mixer tube shall be properly placed and securely positioned so it will not twist, slide or drop out of position while in service. The construction shall be such that the burner(s) can be installed only in its correct position. It may be attached by means of hex head bolts, cotter pins or hex head screws if the fasteners are easily accessible, constructed of corrosion-resistant material and not located in a high temperature zone.

1.5.2

A main burner shall be removable and replaceable without disconnecting threaded joints of the appliance inlet gas piping, other than those of the union type or listed gas appliance connector. This shall be accomplished without the use of special tools or requiring tool manipulation within the burner compartment.

1.5.3

Bodies of burners (including mixer head, mixer tube and burner head) shall be of substantial and durable construction. They shall be constructed of materials having melting points above 1450°F (788°C).

1.5.4

Bolt holes shall not intersect gasways.

1.5.5

Joints used in the pressure zone or in the burner head of a burner assembly shall be gastight and shall not depend for mechanical strength or primarily for tightness on set screws, cement or other sealing materials, except when such joints form part of the port area. The burner head shall be a single casting or the joints

shall be welded, brazed, bolted, be of screw-joint construction or of an equally rigid and gastight construction. Pipe used in burner construction shall be at least the weight of standard wrought steel pipe as defined in the Standard for *Welded and Seamless Wrought Steel Pipe, ANSI/ASME B36.10M*.

1.5.6

Ports shall be machined or otherwise accurately made.

1.5.7

A removable burner head shall fit on the mixer tube in the correct position only and be connected so it will remain in the proper position without the use of set screws.

1.5.8

Sheet-metal burner parts shall be constructed of AISI C1010 steel at least 0.0304 in (0.772 mm) thick or metal having equivalent or superior strength and durability.

1.5.9

Ribbon burners shall be constructed so the ribbon assembly can be easily removed, thoroughly cleaned, and easily and correctly reinstalled and secured in position in the field without the use of special tools.

1.5.10

When carry-over flames are necessary to accomplish satisfactory ignition between adjacent rows of ports or adjacent burners, carry-over shall be effected by more than one series of ports.

1.5.11

Means shall be provided to permit observation of the flames and ignition source.

1.5.12

Gauges shall not be used in burner construction.

1.5.13

The main burner(s) shall not depend on runner arms or flash tubes for ignition.

1.6 Primary Air Adjustment Means

1.6.1

Primary air adjustment means, when provided, shall not change position by the action of gravity when the means for locking the adjustment is loosened sufficiently to permit adjustment.

1.6.2

Primary air adjustment means, when provided, shall be designed so that primary air can be controlled to provide proper flame characteristics.

1.6.3

When air shutters are used, there shall be no openings other than the adjustable openings through which primary air may be entrained. An air shutter shall not have more than two primary air openings, each approximating a circular opening near point of closure, or be of such design and construction as can be demonstrated to provide equally effective protection against stoppage by lint and dust. Other openings through which the main stream of primary air does not flow, such as around the orifice projection, shall be reduced to a practical minimum so as to have no appreciable effect on the flame characteristics when stopped by lint or other means.

1.6.4

Sheet-metal air shutters shall not be less than 0.0304 in (0.772 mm) thick. If sheet-metal air shutters are less than 0.0508 in (1.29 mm) thick, they shall have the outer edges turned at 90 degrees (1.57 rad) or be otherwise properly reinforced.

1.6.5

Air shutters shall be constructed of a corrosion-resistant material or have a corrosion-resistant finish, except when the type of material or construction employed will prevent the air shutter from sticking or corroding in position. Cast-iron shutters are considered acceptable.

1.6.6

Means shall be provided to fix air shutters securely in any desired position. Such means shall be accessible for adjustment with the burner(s) in place and the dryer in operation.

1.7 Orifices And Orifice Holders

1.7.1

Fixed orifices shall be provided for main burners.

1.7.2

Threaded hexagon head or equivalent orifice spuds shall be provided and shall be readily accessible.

1.7.3

Orifice spuds and orifice spud holders shall be constructed of material having a melting point of not less than 800°F (427°C).

1.7.4

An orifice spud holder shall be positively secured to prevent misalignment with the burner mixer.

1.7.5

Main burner orifice spuds shall be threaded to their holders at least 3¹/₂ full threads.

1.8 Automatic Gas Ignition Systems

1.8.1

Each dryer shall be equipped with an automatic gas ignition system (see Part IV, Definitions). This system shall be designed to function in either of the following manners:

- a. Provide for ignition of main burner gas using a direct ignition system which only supervises the main burner(s) flame.

If the presence of the main burner flame is not proved, provide for automatic shutoff of main burner gas.

In the event of main burner flame outage during an operating cycle, provide for automatic shutoff of main burner gas without reenergizing the direct ignition device, or provide for prompt and safe reignition of main burner gas by reenergizing the direct ignition device.

- b. Provide for ignition of main burner gas using a direct ignition system incorporating a proved igniter, which proves that the igniter is capable of ignition prior to initiation of main burner gas flow.

For systems which supervise main burner flame during an operating cycle and deenergize the igniter, provide for automatic shutoff of main burner gas in the event of main burner flame outage.

1.8.2

Automatic gas ignition systems (see Part IV, Definitions) and components shall comply with the applicable provisions of the Standard for *Automatic Gas Ignition Systems and Components*, ANSI Z21.20 and Standard for *Automatic Gas Ignition Systems and Components*, CAN1-6.4; and the Standard for *Combustion Safety Controls Safety Controls and Solid-State Igniters for Gas- and Oil-Burning Equipment*, CAN/CSA C22.2 No. 199.

1.8.3

An ignition device shall be designed and installed so the relative position of the device and main burner(s) will be maintained. Mounting of the ignition device or main burner directly or indirectly on members that may warp in service with resulting misalignment between the ignition device and the main burner(s) shall not be considered as complying with this provision.

1.8.4

Automatic gas ignition system components shall be installed so the operation of these components and main burner ignition will not be affected by falling scale, lint or dirt during normal operation.

1.8.5

Ignition devices shall be placed so they can be seen and removed. This provision shall be deemed met if the main burner assembly to which these devices are attached can be removed intact. (See 1.5.2.)

1.9 Manually Operated Appliance Main Gas Valves

1.9.1

Manually operated appliance main gas valves, when provided, shall comply with the applicable provisions of the Standard for *Manually Operated Gas Valves for Appliances, Appliance Connector Valves and Hose End Valves*, ANSI Z21.15 • CGA-9.1; and the Standard for *Combination Gas Controls for Gas Appliances*, ANSI Z21.78 • CSA 6.20.

1.9.2

When a manually operated appliance main gas valve is exposed to view, lever, tee handles or slot shall be at 90 degrees (1.57 rad) to the line of flow when in the “off” position and parallel when in the “on” position. If this cannot be accomplished, or if the valve handle only is exposed to view, the “on” and “off” positions or direction of rotation to open and close shall be clearly indicated by a Class IIIB marking.

1.9.3

Removable handles shall be constructed so they cannot be incorrectly attached.

1.9.4

Gas burner valves shall be self-latching in the “off” position unless located so they will not be liable to accidental change of setting.

1.9.5

Self-latching valves shall be positive in their action, shall not require for their operation an axial displacement of the plug in contact with the barrel or application of undue pressure on the plug which might cause the valve to stick, and shall permit ready operation with one hand and accessibility to all parts for repair and replacement.

1.10 Gas Supply Lines

1.10.1

Steel pipe employed as gas conduit on dryers shall comply dimensionally with the Standard for *Welded and Seamless Wrought Steel Pipe*, ANSI/ASME B36.10M.

1.10.2

When iron pipe size connections are used, the threads shall comply with the Standard for *General Purpose Pipe Threads (Inch)*, ANSI/ASME B1.20.1.

1.10.3

Tapped holes for branch supply lines shall carry not less than 3¹/₂ taper pipe threads in accordance with the Standard for *General Purpose Pipe Threads (Inch)*, ANSI/ASME B1.20.1.

1.10.4

Ends of piping and tubing shall be carefully reamed to remove obstructions or burrs.

1.10.5

Formed supply piping shall have the bends smoothly made without any appreciable reduction in cross-sectional area, shall reveal no imperfections occasioned by the forming process, shall be annealed if necessary to remove internal stresses, and shall be thoroughly cleaned inside to remove loose particles.

1.10.6

Gas supply piping, tubing and fittings shall be rigidly supported and readily removable.

1.10.7

Gas supply piping shall be rigidly supported to prevent turning or lateral displacement while making connections to building piping or during ordinary handling of the dryer.

1.10.8

Compounds used on the threaded joints of appliance piping shall be resistant to the action of liquefied petroleum (propane) gases.

1.10.9

The dryer shall be equipped with either a union that would permit the main burner control manifold to be removed without disconnecting the existing supply line or provided with an instruction to install the dryer using a listed connector in compliance with the Standard for *Connectors for Gas Appliances*, ANSI Z21.24 • CSA 6.10. See 1.22.6-b17. Unions in appliance piping for use with liquefied petroleum (propane) gases or LP gas-air mixtures shall be of the ground-joint type or a flanged joint having packing resistant to the action of such gases.

1.10.10

Nonferrous semi-rigid tubing employed as gas conduit shall have a wall thickness in accordance with Table I, Minimum Acceptable Wall Thickness for Nonferrous Semi-Rigid Tubing.

1.10.11

Tubing and fittings used as gas conduit shall be capable of withstanding a temperature of 1000°F (538°C) without melting.

Tubing and fittings used as gas conduit shall not be exposed to temperatures in excess of those specified in Table II, Maximum Tubing and Fitting Temperatures, when the dryer is operated as specified in 2.14.1 or 2.14.2, whichever is applicable.

1.10.12

Series 300 stainless steel corrugated tubing used as part of a manifold assembly shall not be exposed to temperatures in excess of 700°F (371°C) when the appliance is operated as specified in 2.14, Wall, Floor and Ceiling Temperatures. The tubing shall demonstrate compliance with the Tubing Structure, Bending Test, and Burst Test requirements specified in the Standard for *Connectors for Gas Appliances*, Z21.24 • CSA 6.10.

1.10.13

Aluminum semi-rigid tubing shall not be acceptable when it passes through insulating material of other than neutral reaction, unless the tubing is protected from the insulation.

1.10.14

Aluminum semi-rigid tubing shall not be exposed to condensate.

1.10.15

Copper semi-rigid tubing or tubing with internal copper surfaces, when used for conveying gases, shall be internally tinned or equivalently treated to resist sulphur corrosion.

1.10.16

Gas supply piping shall be located so it is not subject to excessive heat tending to cause burnout or excessive corrosion.

1.11 Automatic Valves

1.11.1

Automatic valves shall comply with the applicable provisions of the Standard for *Automatic Valves for Gas Appliances*, ANSI Z21.21 • CSA 6.5, or the Standard for *Combination Gas Controls for Gas Appliances*, ANSI Z21.78 • CSA 6.20, as applicable.

1.11.2

Electrically operated automatic valves shall be of the type that will close upon current failure.

1.11.3

All gas to the main burner(s) shall pass through at least two valves in series which may or may not be in a single control body. These two valves shall be two automatic valves, each acting as an operating valve and a safety shutoff valve, except that only one valve need operate as a safety shutoff valve on flame failure if a reignition attempt is made.

1.11.4

Reverse-acting gas-actuated controls shall be arranged so the escapement gas bleeds off only momentarily and there is no continuous bleed during the "off" period.

1.11.5

When an automatic valve is used with a gas supply line of semi-rigid tubing, the automatic valve shall be supported independently of the tubing.

1.11.6

When an automatic valve is used to control the gas supply to main burners, no means for manual operation of the valve shall be provided to open the gas supply in the event of current failure.

WARNING: For your safety the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death.

1.11.7

Automatic valves shall be installed on the appliance so as to be readily removable. Manifold assemblies which permit removal of controls intact shall be considered as complying with this provision.

1.12 Gas Appliance Pressure Regulators

1.12.1

A gas appliance pressure regulator which will satisfactorily limit the gas supply pressure shall be provided on a dryer for use with natural, manufactured or mixed gases or LP gas-air mixtures and may be provided with a dryer for use with liquefied petroleum gases.

1.12.2

Gas appliance pressure regulators, including vent limiters when so equipped, shall comply with the applicable provisions of the Standard for *Gas Appliance Pressure Regulators*, ANSI Z21.18 • CSA 6.3 or the Standard for *Combination Gas Controls for Gas Appliances*, ANSI Z21.78 • CSA 6.20, as applicable.

1.12.3

An adjustable regulator shall be provided with a cap for concealing the adjustment means.

1.12.4

A gas appliance pressure regulator shall be installed on the dryer so as to be readily removable. Manifold assemblies which permit removal of controls intact shall be considered as complying with this provision.

1.12.5

A gas appliance pressure regulator which requires access to the atmosphere for proper operation shall be furnished with either a vent line or a vent limiter.

1.12.6

A test gage connection shall be furnished downstream of the gas appliance pressure regulator for measuring gas pressure. The connection shall be a minimum $\frac{1}{8}$ in NPT plug or cap with cleanly cut taper pipe threads in accordance with the Standard for *Pipe Threads, General Purpose (Inch)*, ANSI/ASME B1.20.1. If the plug is of the slotted type, it shall also incorporate square or hex flats, or;

When pressure test gage connection is provided as a part of the control, this pressure test gage connection shall be:

- a. A tapping sealed by a minimum $\frac{1}{8}$ in NPT plug or cap as specified above; or
- b. A hose fitting with a minimum length of 0.335 in (8.51 mm) and a 0.355 in (9.02 mm) maximum/0.335 in (8.51 mm) minimum outside diameter and which incorporates a sealing means. The construction of the hose fitting shall incorporate an internal restriction not greater than 0.0394 in (1.0 mm) in diameter.

1.13 Combination Controls

Combination controls (see Part IV, Definitions), when provided, shall comply with the applicable provisions of the Standard for *Combination Gas Controls for Gas Appliances*, ANSI Z21.78 • CSA 6.20.

1.14 Bleeds And Vents

1.14.1

A diaphragm type automatic valve incorporating an external bleed shall be equipped with a bleed line.

A gas appliance pressure regulator shall be equipped with either a vent line or vent limiter.

1.14.2

If the regulator is not equipped with a vent limiter, provisions shall be included for installation of a vent line from the regulator to the outdoors in accordance with the manufacturer's installation instructions (see 1.22.6-b15).

A bleed line from a diaphragm type automatic valve shall be vented in such a manner as to provide for burning of bleed gas during normal operation. In the event of diaphragm rupture, the bleed shall not permit the escape of more than 1.0 ft³/hr (7.87 cm³/s) of 0.6 specific gravity at 7.0 iwc pressure (1.74 kPa) for natural, manufactured or mixed gases or LP gas-air mixtures, and 0.5 ft³/hr (3.93 cm³/s) of 1.53 specific gravity at 11.0 iwc pressure (2.74 kPa) for liquefied petroleum gases.

1.14.3

When a vent line is provided for a gas appliance pressure regulator, a No. 40 mesh brass, aluminum or equivalent wire screen, sufficient in size to provide free area equal to the area of the escapement orifice, shall be installed in and made a part of the connecting fitting for installation at the pressure regulator vent tapping. The fitting, when tightened against the screen, shall provide no opening larger than the mesh of the screen specified. The above provisions are applicable only when the pressure regulator escapement orifice diameter is larger than 0.0165 in (0.419 mm).

1.15 Combustion Chambers

When secondary air openings are provided in the bottom sheet of the combustion chamber, provision shall be made to prevent heated material from falling through these openings to the floor.

1.16 Temperature Limiting Devices

1.16.1

The dryer shall be equipped with a suitable device(s) to control the temperature in the drying chamber.

1.16.2

Thermostats other than electric switch types, when provided, shall comply with the applicable provisions of the Standard for *Gas Appliance Thermostats*, ANSI Z21.23, and CAN1-6.6.

Electric switch type thermostats shall comply with the applicable provisions of the Standard for *Gas Appliance Thermostats*, ANSI Z21.23, and CAN1-6.6 or CSA C22.2 No. 24, *Temperature Indicating and Regulating Equipment*, or shall be listed or certified by a nationally recognized testing agency qualified to list or certify such thermostats.

1.16.3

A high-temperature limiting device which functions independently of the operating temperature control device shall be provided.

1.17 Electrical Equipment And Wiring

1.17.1

See Exhibit A for Items Unique to the United States and Exhibit B for Items Unique to Canada.

1.17.2

The leads or terminals of an individual control, in the gas control circuit, that are provided for making electrical connections and which are intended to be disconnected in order to replace or service the control shall be identified by a number(s), letter(s), symbol(s) or combination thereof, in a color which contrasts with the background. This provision does not apply when:

- a. The control incorporates means which will physically prevent miswiring; or
- b. The control incorporates only two terminals or leads, the interchange of which does not change the operation of the control.

1.18 Motors And Blowers

1.18.1

See Exhibit A, Items Unique to the United States, and Exhibit B, Items Unique to Canada, for provisions covering motors.

1.18.2

Motor, blower or fan bearings shall be either (a) permanently lubricated or (b) provided with accessible means for lubrication. The removal of screws in access panels shall be considered acceptable. Also see [1.22.8-b](#) and [1.23.8](#).

1.19 Loading Doors

1.19.1

Loading doors shall be substantially reinforced so as to prevent warping.

1.19.2

Loading doors shall not show breakage, permanent deflection or damage to any part thereof when subjected to a load of 50 lb (22.7 kg), uniformly applied for a period of 5 minutes without impact along the top edge of swing type doors when perpendicular to the plane of the face of the dryer, or along a strip 4 in (102 mm) wide and the full width of drop doors which stop in the horizontal position, equidistant from the hinges and the outer edge of the door when open.

1.19.3

Swing-type doors on the drying chamber shall be equipped with a means to hold the door closed. Swing-type doors shall also comply with 2.17, Door and Catch Test.

1.20 Moisture And Lint Disposal

1.20.1

The dryer shall be provided with means for exhaust duct connection. Dryers shall be provided with a suitable collar that will accommodate standard duct material of integral inch size.

1.20.2

When a lint screen is provided upstream from the exhaust duct collar, the lint screen shall be readily removable or easily accessible for cleaning without disconnecting the exhaust duct.

1.21 Insulation

1.21.1

When insulation is employed, it shall be uniformly packed and provided with protection to prevent shifting, deterioration from excessive heat, and contact with rotating parts.

1.21.2

Thermal insulation shall be considered as an electrically dead-metal part and shall be reliably spaced from electrically live parts in accordance with the applicable spacings specified in Exhibits A, Items Unique to the United States and B, Items Unique to Canada.

1.22 Instructions

For dryers sold in Canada, also see Exhibit B, Items Unique to Canada.

Instructions shall be reviewed by the testing agency for comprehensibility, accuracy, and compatibility with results of test and with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54* or the *Natural Gas and Propane Installation Code, CSA B149.1*.

1.22.1

Instructions for the proper installation, operation, and maintenance of the dryer may be provided as separate manuals or combined as one manual. Each manual provided shall contain instructions to retain the manual for future reference.

1.22.2

Type I household dryers shall include:

- a. Installation instructions;
- b. Operating instructions; and
- c. Maintenance instructions.

1.22.3

Type I commercial dryers shall include:

- a. Installation instructions; and
- b. Maintenance instructions.

1.22.4

The front cover or the first page of the manual containing the operating instructions shall bear the following boxed warning. It shall be boxed as shown:

.....

Warning: For your safety the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death.

—Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

—WHAT TO DO IF YOU SMELL GAS

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Clear the room, building or area of all occupants.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

—Installation and service must be performed by a qualified installer, service agency or the gas supplier.

The letters used for the boxed statement above shall be bold-faced type having a minimum uppercase letter height of 0.120 in (3.05 mm). The minimum vertical spacing between lines of type shall be 0.046 in (1.16 mm).^{*} Lowercase letters shall be compatible with the uppercase letter size specification.

1.22.5 The front cover or the first page of the installation instructions for a Type I commercial dryer shall bear:

- a. A note instructing the purchaser to post in a prominent location instructions to be followed in the event the user smells gas. The information to be posted shall be obtained by consulting with the local gas supplier.
- b. The following "For Your Safety" caution, with a note instructing the purchaser to post this caution in a prominent location:

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

^{*} This letter height and line spacing correspond to 12 point type.

1.22.6

The installation instructions shall include:

- a. Assembly instructions for field-installed parts and components, including all controls and accessories (when applicable).
- b. Statements indicating:

1. The installation must conform with local codes, or in absence of local codes, with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54*, or the *Natural Gas and Propane Installation Code, CSA B149.1*.
2. The dryer, when installed, must be electrically grounded in accordance with local codes, or in the absence of local codes, with the *National Electrical Code, ANSI/NFPA 70*, or the *Canadian Electrical Code, CSA C22.1*.
3. The dryer must not be installed or stored in an area where it will be exposed to water and/or weather.
4. Dryers installed in residential garages must be elevated 18 in (46 cm) above the floor.

Note: If the manufacturer specifies that this dryer must not be installed in a residential garage, this clause is not required.

5. The dryer must be secured to the structure, and methods for installing securing means provided with the appliance.

Note: This applies only to dryers requiring securing means to comply with 1.2.8.-b

6. Clearances from combustible construction.
7. Adequate clearances for servicing and proper operation.
8. Provisions for adequate air supply and adequate clearances for air openings into the combustion chamber.
9. Dimensions of required combustion and ventilation air openings in closet doors.

Note: This applies only to dryers suitable for installation in a closet.

10. No other fuel-burning appliance shall be installed in the same closet as the dryer.

Note: This applies only to dryers suitable for installation in a closet.

11. Combustible materials, gasoline, and other flammable vapors and liquids must not be stored near the dryer.
12. The dryer must be disconnected from the gas supply piping system during pressure testing at pressures greater than $1\frac{1}{2}$ psi (3.5kPa).
13. Proper exhaust installation, indicating the type of exhaust duct, where applicable, and including the following statements:

- (a) The dryer shall not be exhausted into any gas vent, chimney, wall, ceiling, or concealed space of a building; and

- (b) The dryer must be exhausted to the outdoors.
 - (c) Exhaust duct must not be connected or secured with screws or other fastening devices which extend into the interior of the duct.
14. A $\frac{1}{8}$ inch NPT minimum plugged tapping, accessible for test gage connection, must be installed immediately upstream of the gas supply connection to the dryer.
 15. A vent line must be installed from the regulator vent to the outdoors (if applicable, see [1.14.2](#)).
 16. The following wording or the equivalent: "WHEN DISCARDING OR STORING YOUR OLD CLOTHES DRYER, REMOVE THE DOOR."
 17. On dryers not equipped with a gas union in the dryer manifold, the instructions shall specify that a listed connector in compliance with the Standard for *Connectors for Gas Appliances*, ANSI Z21.24/CSA 6.10 be used to connect the dryer to the supply piping.
- c. Dryers suitable for installation in a mobile home shall contain the following additional installation instructions:
1. That the installation of the dryer conform to the *Manufactured Home Construction and Safety Standard*, Title 24 CFR, Part 3280, or the Standard for *Mobile Homes*, CAN/CSA-Z240 MH.
 2. Means available from the manufacturer for secure attachment of the dryer to the structure (see [1.2.12](#)).
 3. Exhaust ducts must be securely fastened to a noncombustible portion of the mobile home structure and must not terminate beneath the mobile home.
 4. Mobile home exhaust kit part number if available from the manufacturer, or instructions for the appropriate type, size, and installation of the duct.
 5. Provisions for introduction of outside air into the dryer room. The free area of any opening for the introduction of outside air shall not be less than twice the area of the dryer exhaust outlet.

1.22.7

Operating instructions shall include information, clearly understandable, for the safe use and operation of the dryer. The operating instructions shall contain statements indicating the following wording or the equivalent:

"Do not allow children to play on or in the appliance. Close supervision of children is necessary when the appliance is used near children."

1.22.8

Maintenance instructions shall include instructions for all maintenance intended to be performed by the user, including recommended frequency guidelines. Maintenance instructions shall include, but are not limited to:

- a. Cleaning of lint screens (when supplied).
- b. Lubrication of moving parts (when applicable), including type and amount of lubricant. (Also see [1.23.8](#).)
- c. Periodic examination of exhaust systems.

- d. Source for replacement parts.
- e. Keeping dryer area clear and free from combustible materials, gasoline and other flammable vapors and liquids.
- f. Keeping dryer area clear and free from items that would obstruct the flow of combustion and ventilation air.

1.22.9

Also see [1.2.8-b](#), [1.14.2](#), [1.23.3](#) through [1.23.6](#) and [1.23.8](#).

1.23 Marking

1.23.1

Marking material shall be identified by class number and shall meet the following specifications. All metal marking materials shall be rustproof. All markings shall be suitable for application to surfaces upon which applied. The designation of any class of marking shall not preclude the use of marking of a lower number class.

Class I. Integral Marking

Marking that is embossed, cast, stamped or otherwise formed in the part. This includes markings baked into an enamelled surface.

Class IIA-1. Permanent Plate

Shall be made of metal having a minimum thickness of 0.012 in (0.30 mm) and shall be securely attached by mechanical means.

Class IIA-2. Permanent Plate

Shall be made of metal having a thickness of 0.006 to 0.012 in (0.15 to 0.30 mm) and shall have mechanical attachment means at all corners with a maximum spacing of 6 in (152 mm) between mechanical fasteners.

Class IIA-3. Permanent Plate

Shall be made of metal having a thickness less than 0.006 in (0.15 mm). Such plates shall be attached by means of nonwater-soluble adhesive which will comply with 2.19, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.14, Wall, Floor and Ceiling Temperatures.

Class IIA-4. Permanent Plate

Shall be made of pressure-sensitive metal foil requiring no solvent or activator, provided such plates comply with 2.19, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.14, Wall, Floor and Ceiling Temperatures.

Class IIIA-1. Permanent Label

Shall be made of material not adversely affected by water, shall be attached by means of nonwater-soluble adhesive, and shall comply with 2.19, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 300°F (149°C) as determined during conduct of 2.14, Wall, Floor and Ceiling Temperatures.

Class IIIA-2. Permanent Label

Shall be made of material not adversely affected by water, shall be attached by means of nonwater-soluble adhesive and shall comply with 2.19, Marking Material Adhesion and Legibility. These materials shall not be located on surfaces having temperatures exceeding 175°F (79.5°C) as determined during conduct of 2.14, Wall, Floor and Ceiling Temperatures.

Class IIIB. Waterproof Marking

Shall be printed directly on the part with waterproof marking not adversely affected by a temperature of 175°F (79.5°C) and shall comply with 2.19, Marking Material Adhesion and Legibility. This marking shall not be used on surfaces having temperatures exceeding 175°F (79.5°C) as determined during conduct of 2.14, Wall, Floor and Ceiling Temperatures.

Class IIIC. Waterproof Label

Shall be made of material not soluble in water, and may use water-soluble adhesive for attachment means.

Class IV. Nonwaterproof Label

Shall be made of material which may be soluble in water, and may use water-soluble adhesive for attachment means.

Class V. Printed Marking

Marking shall be clear and prominent and may be applied directly by any printing means.

Class VI. Attached Tags

1.23.2

RATING PLATE(S). Each dryer shall bear a plate or a combination of adjacent plates of Class IIIA marking material located so as to be easily read when the dryer is in a normally installed position. A plate(s) visible after removal of an access panel, without the use of tools, is satisfactory. This plate(s) shall include the following information:

- a. The manufacturer's, dealer's or distributor's name and address.
- b. The manufacturer's model number.
- c. A distinctive number or numbers which will identify an individual dryer.
- d. Type of gas for which tested: Nat., Mfd., Mix., Propane, LP or Btu LP gas-air mixture; and the type of gas for which equipped: Nat., Mfd., Mix., Propane, LP or ____ Btu LP gas-air mixture (the heating value for the LP gas-air mixture shall be indicated).
- e. The manifold pressure recommended by the manufacturer.

- f. Maximum permissible gas supply pressure (____iwc). The value inserted in the blank shall be the same as the increased inlet test pressure specified in [Table V, Inlet Test Pressures](#), for the type of gas for which the appliance is certified.
- g. Minimum permissible gas supply pressure for purpose of input adjustment when the dryer is equipped with a gas appliance pressure regulator.
- h. The manufacturer's input rating as follows:

"Input Btuh (kW)"
- i. Electrical rating - voltage, frequency, and total input in amperes as follows:

" V," " Hz," " A"
- j. Identification of this standard by indicating either this edition of the standard, or the most recent effective addenda thereto, with one of the following markings:

"ANS Z21.5.1 • CSA 7.1-(year) Clothes Dryers, Vol. I;"
"ANS Z21.5.1a • CSA 7.1a-(year) Clothes Dryers, Vol. I;" or
"ANS Z21.5.1b • CSA 7.1b-(year) Clothes Dryers, Vol. I."

The last two digits of the year may be used to indicate the year of the standard or addenda.
- k. The symbol of the organization making the tests for compliance with this standard.

1.23.3

INSTRUCTION PLATE. A dryer which requires more than the manual operation of a single control external to the dryer to place it in service shall have clearly defined, legible and complete instructions for lighting and shutting down the dryer on Class IIIC marking material. These instructions shall be located on or adjacent to the controlling device or in an equally conspicuous position where the instructions can be easily read and readily observed by the operator. Lighting instructions shall specify a 5 minute complete shutoff period before the dryer is relighted.

1.23.4

CLEARANCE MARKINGS.

- a. Each dryer shall bear a marking on Class IIIC marking material, located as specified in [1.23.3](#) or where visible during installation, stating the minimum clearances from combustible construction for the top, all sides and the exhaust duct surfaces. A dryer complying with the optional provisions of [2.14.2](#) shall also be marked to indicate closet installation requirements. The clearance between the exhaust duct where it pierces the enclosure and combustible construction, if other than zero, shall also be included.
- b. A dryer which requires clearance from any type of construction for serviceability or proper operation shall bear a marking on Class IIIC marking material, located on the surface(s) requiring such clearance or where visible during installation, indicating the minimum distance required.

1.23.5

A dryer for closet installation shall bear a statement on Class IIIA marking material, referring to the installation instructions for closet installation. This statement shall (1) be located as specified in [1.23.2](#), or (2) be visible during installation.

1.23.6

A clothes dryer equipped with securing means utilized to comply with 1.2.8 shall bear a Class IV marking prominently located on the front or top of the dryer reading to the effect that the installation is not complete until the dryer is secured to the structure with the securing means provided and that the installation instructions should be referred to for proper installation.

1.23.7

A dryer for domestic use which is also suitable for manufactured home installation (see 1.2.12) shall incorporate on the rating plate, or on a separate marking plate of Class IIIA marking material adjacent to the rating plate, a permanent and prominent statement reading to the effect that the dryer is also suitable for manufactured home installation. If the part numbers of the installation and exhaust kits are not included on this plate, a marking shall be incorporated to indicate the location of this information.

Any of the following may be substituted for manufactured home in the above marking:

- a. Mfd. home (mobile home);
- b. Manufactured (mobile) home;
- c. Mfd. (mobile) home;
- d. Manufactured home; or
- e. Mfd. home.

1.23.8

Suitable instructions for lubrication of motor and blower or fan bearings, if applicable, shall be provided on a Class V marking either on the fan or blower housing or on surfaces adjacent to the means of access.

1.23.9

ELECTRICAL DIAGRAMS. Each dryer shall bear a marking on Class IV marking material stating, "Caution: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing."

1.23.10

The dryer shall bear a marking, on Class IIIA marking material, located so as to be readily visible to the user when loading the dryer, on which appears wording to warn the user that:

- a. The dryer must be used only for water washed fabrics; and
- b. Heat should not be used for drying foam rubber items or similarly textured rubberlike material.

1.23.11

All dryers shall bear a Class IIIA-2 label stating "This Dryer must be Exhausted to the Outdoors" or equivalent wording. The marking shall be in letters not less than $\frac{1}{8}$ in (3.2 mm) high which will be readily visible on the enclosure front, or from the front when the dryer door is opened.

1.23.12

Also see 1.9.2.

1.23.13

A clothes dryer certified for domestic use in Canada with natural gas and propane and convertible to the alternate gas, shall bear a Class III marking on or adjacent to the rating plate to the effect as follows: "For use with natural gas and propane, a conversion kit, as supplied by the manufacturer, shall be used to convert this dryer to the alternate fuel."