


GENERAL

The products covered are those specified in the individual sections noted as to conforming to Canadian National Standards.

LISTING MARK (CANADA):

1. Where models meet only the Canadian requirements (or wish to only be marked as so) as indicated in the individual Classifications.


ELEMENTS:

- a) C-UL symbol:  LISTED
- b) The word "Listed."
- c) The Canadian Product Identity (English or English/French) as shown in the Product Covered sections of the Procedure or as specified below. "FIRE EXIT HARDWARE"

2. Where models meet both UL and Canadian requirements as indicated in the individual Listings.

In addition to the information on the basic UL Listing Mark (shown either in Sec. Gen. or in the individual sections) models eligible for Canadian Listing may also bear the following:

ELEMENTS:

- a) C-UL symbol:  LISTED
- b) The Canadian product Identity (English or English/French) as shown in the Product Covered sections of the Procedure or as specified below. "FIRE EXIT HARDWARE"
- c) The word "Listed."

CONCLUSION

The following conclusions represent the judgement of Underwriters Laboratories Inc., based upon the results of the examination and the test presented in this Report as they relate to established principles and previously recorded data.

FIRE RETARDANT PROPERTIES:

The 5000 Series rim type fire exit hardware assemblies described in Test Record No. 2 in this Report maintained their structural integrity throughout the 3 h fire endurance test. The performance of the assemblies was within the "Conditions of Acceptance" specified in Standard for Safety UL 10B.

HOSE STREAM RESISTANCE:

The 5000 Series rim type fire exit hardware assemblies described in Test Record No. 2 in this Report maintained their structural integrity through and after the application of the 45 psi (310 kPa) hose stream. The performance of the assemblies described in Test Record No. 2 was within the "Conditions of Acceptance" specified in Standard for Safety, UL 10B.

LISTING AND FOLLOW-UP SERVICE:

The 5000 Series rim type fire exit hardware assemblies, as described herein, incorporating the revised chassis head reinforcement are judged to be eligible for Listing and Follow Up Service of Underwriters Laboratories Inc. Under the Service the manufacturer is authorized to use the Laboratories' Listing Marking on the 5000 Series Fire Exit Hardware assemblies when the 5000 Series Fire Exit Hardware assemblies comply with the Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those 5000 Series Fire Exit Hardware assemblies, doors and frame assemblies which properly bear the Laboratories' Listing Marking are considered as Listed by Underwriters Laboratories Inc.

The hardware Listing Mark reading: "Fire Exit Hardware" will cover the design and construction of the hardware.

Installation Instructions shall be provided with each assembly.

DESCRIPTION

PRODUCT COVERED:

5000/55

USL, CNL Series 5000SS and 5000 - 1SS Fire-Exit Hardware of the rim type, for use on swinging fire doors rated 3, 1-1/2 and 3/4 h.

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

CNL indicates investigation to Canadian National Standards CAN 4 S-104-M80 and ULC-S132.

GENERAL:

This hardware is designed for application to single outwardly swinging doors. A horizontal push bar extending a minimum of two-thirds the distance across the door and when depressed will release the latch and permit the door to open.

The presence of various types of outside operation and locking devices in no way interferes with the operation of the push bar.

This device is not provided with a means for dogging the push bar or latch.

This rim device is designed for use on single swing door assemblies measuring 4 ft wide by 8 ft high.

CONSTRUCTION DETAILS:

The individual component construction details of the hardware are shown by the following description.

MARKING:

The Listing Mark of Underwriters Laboratories Inc. reading: "Fire Exit Hardware" Label Code 14-7 and shall be placed on the center case assembly. This label shall be either metal or a pressure-sensitive label and is to be secured so that it does not interfere with operation of the components.

In addition, the Listee's name and model designation shall be placed on the device.

TEST SAMPLES:

The test assembly consisted of two single swing door assemblies with each door employing one sample of the 5000 Series rim type fire exit hardware.

The construction and size of the test assembly, was representative of that for which Listing was desired.

A floor structure was provided as part of the opening to be protected. The floor segment was of noncombustible material and projected into the furnace approximately twice the thickness of the test door.

CONSTRUCTION DETAILS:

DOOR

Each door was designed for an opening 48 in. (1219 mm) in width and 96 in. (2438 mm) in height.

Each door was constructed in accordance with Follow-Up Service Procedure R1952 and bore the UL Classification Mark. The doors incorporated the appropriate reinforcements for the mounting of the hardware.

FRAME

The frame in which each door was mounted was a pressed-steel type frame, manufactured from No. 16 gauge (1.52 mm), cold rolled steel with 5/8 in. (15.9 mm) high stops. The frame was constructed in accordance with Follow Up Service Procedure R1984. The appropriate latch and hinge reinforcements along with the attachment of masonry strap type anchors were provided. The frame was capable of bearing the UL Listing Mark.

HARDWARE

Each door assembly incorporated the manufacturer's 5000 Series rim type fire exit hardware with a 5/8 in. (16 mm) latch throw. Each latch had an engagement of 1/2 in. (13 mm) into its respective strike plate.

Each door was provided with four full mortise type steel hinges of the ball bearing type, 4-1/2 in. (115 mm) high and 0.134 in. (3.5 mm) thick. The hinges were attached to the door and frame with screws.

WALL

Each door and frame assembly was installed into a 12 in. (305 mm) thick masonry brick wall. The frame was secured to the wall with masonry strap type anchors.

*part of a building that is
made of stone and mortar*

TEST RECORD NO. 1

TEST SAMPLES:

The test assembly consisted of two single swing door assemblies with each door employing one sample of the 5000 Series rim type fire exit hardware.

The construction and size of the test assembly, was representative of that for which Listing was desired.

A floor structure was provided as part of the opening to be protected. The floor segment was of noncombustible material and projected into the furnace approximately twice the thickness of the test door.

CONSTRUCTION DETAILS:

DOOR

Each door was designed for an opening 48 in. (1219 mm) in width and 96 in. (2438 mm) in height.

Each door was constructed in accordance with Follow-Up Service Procedure R1952 and bore the UL Classification Mark. The doors incorporated the appropriate reinforcements for the mounting of the hardware.

FRAME

The frame in which each door was mounted was a pressed-steel type frame, manufactured from No. 16 gauge (1.52 mm), cold rolled steel with 5/8 in. (15.9 mm) high stops. The frame was constructed in accordance with Follow Up Service Procedure R1984. The appropriate latch and hinge reinforcements along with the attachment of masonry strap type anchors were provided. The frame was capable of bearing the UL Listing Mark.

HARDWARE

Each door assembly incorporated the manufacturer's 5000 Series rim type fire exit hardware with a 5/8 in. (16 mm) latch throw. Each latch had an engagement of 1/2 in. (13 mm) into its respective strike plate.

Each door was provided with four full mortise type steel hinges of the ball bearing type, 4-1/2 in. (115 mm) high and 0.134 in. (3.5 mm) thick. The hinges were attached to the door and frame with screws.

WALL

Each door and frame assembly was installed into a 12 in. (305 mm) thick masonry brick wall. The frame was secured to the wall with masonry strap type anchors.

TEST RECORD NO. 2

TEST SAMPLES:

The test assembly consisted of two single swing door assemblies with each door employing one sample of the 5000 Series rim type fire exit hardware. These assemblies were slightly modified from the those tested under Test Record No. 1, in that the chassis was enhanced to limit the deflection of the latching enclosure.

The construction and size of the test assembly, was representative of that for which Listing was desired.

A floor structure was provided as part of the opening to be protected. The floor segment was of noncombustible material and projected into the furnace approximately twice the thickness of the test door.

CONSTRUCTION DETAILS:

DOOR

Each door was designed for an opening 48 in. (1219 mm) in width and 96 in. (2438 mm) in height.

Each door was constructed in accordance with Follow-Up Service Procedure R1952 and bore the UL Classification Mark. The doors incorporated the appropriate reinforcements for the mounting of the hardware.

FRAME

The frame in which each door was mounted was a pressed-steel type frame, manufactured from No. 16 gauge (1.52 mm), cold rolled steel with 5/8 in. (15.9 mm) high stops. The frame was constructed in accordance with Follow-Up Service Procedure R1984. The appropriate latch and hinge reinforcements along with the attachment of masonry strap type anchors were provided. The frame was capable of bearing the UL Listing Mark.

HARDWARE

Each door assembly incorporated the manufacturer's 5000 Series rim type fire exit hardware with a 5/8 in. (16 mm) latch throw. Each latch had an engagement of 1/2 in. (13 mm) into its respective strike plate.

Each door was provided with four full mortise type steel hinges of the ball bearing type, 4-1/2 in. (115 mm) high and 0.134 in. (3.5 mm) thick. The hinges were attached to the door and frame with screws.

WALL

Each door and frame assembly was installed into a 12 in. (305 mm) thick masonry brick wall. The frame was secured to the wall with masonry strap type anchors.

INSTALLATION:

The test assemblies were built into the masonry wall contained within the test frame.

The swinging doors were mounted so as to have the north door assembly open into the furnace chamber while the south door was mounted so as to open away from the furnace chamber.

The mounting of the doors were such that they fit snugly within the frame. The mounting allowed free and easy operation of the test doors.

After installation, the average clearances for the swinging door were as shown below:

<u>Door Location</u>	<u>Average Clearance, in. (mm)</u>
Top of Doors	1/8 (3.2)
Hinge Jambs	1/8 (3.2)
Latch Jambs	1/8 (3.2)
Bottom of Doors	3/8 (9.6)

The general appearance of the exposed and unexposed faces of the test assembly is shown by ILLS. 9 and 10, respectively.

FIRE ENDURANCE TEST:

METHOD

After the wall had seasoned, the fire test was conducted in accordance with the Standard for Fire Tests of Door Assemblies, UL 10B (NFPA 252).

Throughout the fire test, observations were made on the character of the fire, the condition of the exposed and unexposed faces and all developments pertinent to the performance of the doors as a fire retardant with special reference to stability and flame passage.

RESULTS

Observations Of Exposed Face - The fire was luminous and well distributed during the fire test. The temperatures within the furnace chamber were controlled in accordance with the Standard Time-Temperature Curve as shown on ILL. 11.

The pressure in the furnace chamber was maintained as nearly equal to atmospheric pressure as possible. Measurements of the static pressure during the fire exposure test were made using three pressure taps, one located at the top of the door one in the middle and one at the bottom. The measurements recorded are shown in ILL. 12.

RESULTS

The observations on the exposed side during the fire exposure were as follows:

<u>Time, min</u>	<u>Observations</u>
3	The door skins began to <u>buckle</u> and <u>warp</u> .
170	The north frame header had <u>sagged</u> approximately 3/4 in. at its mid-width.
180	No further changes were noted. The furnace fire was extinguished.

Observations Of Unexposed Side - The unexposed surface temperatures of the door assembly were measured and recorded. The average unexposed surface temperature rise, measured after 30 min of fire exposure, was 925°F (514°C). The recorded temperatures of the unexposed surface are shown on ILL. 13. The thermocouple locations are shown on ILL. 10.

The observations on the unexposed face during the fire exposure were as follows:

<u>Time, min</u>	<u>Observations</u>
5	Both of the door assemblies had begun to distort into the furnace chamber. The mid-width deflection of the south door would reach approximately 2 in. by the conclusion of the fire exposure period.
180	No further changes were noted. The furnace fire was extinguished.

No flaming occurred on the unexposed surface of the door assembly during the entire Listing period.

The door frames remained securely fastened to the wall on all sides and did not permit through openings between frame and door or between frame and adjacent wall.

Due to the expansion of the doors within their respective frames, no significant clearance existed between the door edge and the frame rabbet. The hardware held the doors closed in accordance with the conditions of acceptance for an exposure period of 3 h. The latch bolts remained projected and was intact after the test. The hardware was not operable after test.

The test assemblies withstood the fire endurance test, without developing openings through the assembly.

The door assemblies remained in the opening during the fire endurance test.

The movement of the south swinging door resulted in the top latch edge adjacent to the door frame moving from the original position in a direction perpendicular to the plane of the door a maximum of 1-1/4 in. (32 mm) during the entire Listing period.

HOSE STREAM TEST:

METHOD

Immediately after the 180 min fire exposure, the assembly was withdrawn from the furnace and subjected to the impact and cooling effects of the 45 psi (310 kPa) hose stream for 3 s for each square foot of exposed test area, as specified in the Test Standard (UL 10B) for a 3 h fire exposure.

RESULTS

During the application of the hose stream the door bowed out and normal amounts of water passed under the door at the sill.

The hardware held the north and south doors closed in accordance with the conditions of acceptance for an exposure period of 3 h. The latch bolts remained projected and were intact after the test. The hardware was not operable after test.

The north and south door test assemblies withstood the hose stream test without developing openings through the assembly.

The north and south door assemblies remained in the opening during the hose stream test.

The south door assembly consisting of a single swinging door separated 1/8 in. (3.2 mm) at the latch location at the conclusion of the hose stream test.

The north door assembly consisting of a single swinging door was tight up against the frame jams and header at the conclusion of the hose stream test.

The movement of the north swinging door resulted in the top mid-width edge adjacent to the door frame moving from the original position in a direction perpendicular to the plane of the door a maximum of 3/4 in. (19 mm) at the conclusion of the hose stream test.

The north door test assembly withstood the hose stream test without developing openings through the assembly.

The north door assembly remained in the opening during the hose stream test.

The north door assembly consisting of a single swinging door separated 1/8 in. (3.2 mm) at the latch location.

The movement of the top edge of the north swinging door resulted in a movement from the original position in a direction perpendicular to the plane of the door a maximum of 3/4 in. (19 mm) as a result of the hose stream test.

The door frame remained securely fastened to the wall on all sides and did not permit through openings between frame and door or between frame and adjacent wall.

The general appearance of the exposed and unexposed faces of the test assembly after the fire and hose stream exposure is shown by ILLS. 7 and 8, respectively.