

June 9, 2004

Won-Door Corporation
Mr. Carl Goodman
1865 South 3480 West
Salt Lake City, UT 84104.

Our Reference: R6799

Subject: ASTM E 2074

Dear Mr. Goodman,

This letter is in reply to your e-mail of May 5, 2004 that contained a request for a comparison between ASTM E 2074 and the Standard it replaced, ASTM E 152 and how the ASTM E 2074 test method may apply to your product. The ASTM E 152 test method was withdrawn by ASTM on January 1, 1995 and the ASTM E 2074 was last adopted or revised in 2000.

For your reference, the test methods for ASTM E 152 and the Standard, UL10B, "Fire Tests of Door Assemblies" were the same since the ASTM E 152 was based on the UL10B Document. The following is intended to be a general overview of the major differences in testing.

The first noticeable difference between ASTM E 152 or UL10B and ASTM E 2074 is that E 2074 in Par. 12.5 requires side hinged or pivoted swinging doors to have the neutral pressure plane established at a maximum height of 40 in. above the sill where UL10B or ASTM E 152 allowed for the pressure plane on a side hinged or pivoted swinging door to be located at the top of the door assembly. This paragraph in ASTM E 2074 thus allows for positive pressure testing of swinging type doors in a manner similar to that described in UL10C, "Positive Pressure Fire Tests of Door Assemblies." Paragraph 12.5 also states that for swinging elevator doors and all other types of doors that the neutral pressure plane should be, like what is described in UL10B, at or above the top of the door assembly.

The second noticeable difference between ASTM E 2074 and UL 10B or ASTM E 152 concerns the amount or duration of flaming that can occur during the fire exposure test. Both Paragraphs 13.1.2 of ASTM E 2074 and 13.1 of UL 10B state that no flaming can occur during the entire Classification period on the unexposed surface of the test assembly. However, both Paragraphs have exceptions where small amounts of flaming are allowed as long as they meet certain restrictions as described in paragraphs that follow those mentioned above. ASTM E 2074 in Paragraphs 13.1.2.1 and 13.1.2.2 allows for small amounts of flaming to occur as long as it does not exceed a total of 10 s per location around the perimeter of the door during or after the first five minutes of the test. A major difference from ASTM E 2074 is that UL 10B in Paragraph 13.1.1 does not allow any flaming to occur during the first 30 minutes of the test and then after 30



minutes, as described in Paragraph 13.1.2, the flaming cannot exceed 6 in. long or last for intervals exceeding 5 minutes in duration.

The third major difference is the cotton pad test mentioned in Section 9 of ASTM E 2074. The cotton pad test defined in Section 9 is used to evaluate the integrity of the assembly by providing a measure to determine if there is passage of hot gasses and flames to the unexposed surface of the door. The main goal is to make sure that the furnace gases passing around the door are not hot enough to ignite the cotton pad. This type of testing is not described or required by the Standard, UL 10B.

The last major difference is the method to measure unexposed surface temperature on the unexposed face of the door. ASTM E 2074 like UL 10C requires that unexposed surface temperatures are to be measured with copper disk thermocouples where two thermocouple wire leads are attached to a copper disk no more than ½ in. wide. ASTM E 2074 requires that these thermocouples be covered with an insulating pad no greater than 1.2 in. in width or length and no thicker than 0.08 in. on the door surface.

Unexposed surface temperature measurements in a UL 10B test are recorded using beaded thermocouples where the thermocouple wires are twisted together and then welded at the end to form a bead. This construction is not described in UL10B or ASTM E 152 but is the common thermocouple construction typically used for temperature measurement for other types of fire resistive assemblies. What is overtly stated in UL 10B concerning unexposed surface temperature measurement is that in lieu of the 1.2 in. by 1.2 in. pad specified in ASTM E 2074, a 6 in. by 6 in. by 3/8 in. thick pad is to be used. The insulating pad for either test method can be made from refractory fiber.

The second question asked in your request was “is it fair to say that our products tested to UL 10B standard comply with ASTM E 2074.” Our answer would be that since your product was tested to UL 10B, it was tested in a similar manner to ASTM E 2074 and that the door meets many of the same conditions of acceptance with some exceptions. The particular parts of the ASTM E 2074 standard that a special purpose door Classified by UL in accordance with UL 10B would meet are discussed below.

The time-temperature curve for the furnace and hose stream tests are the same for each test method and since your doors are not side hinged or pivoted like a swinging type fire door, the neutral plane as discussed previously would then be located at the top of the door assembly like in a UL 10B test. What this means is that a door assembly like yours that has been tested in accordance with UL 10B has undergone the same furnace exposure (temperature, pressure) and hose stream exposure as a sample tested to ASTM E 2074.

Unexposed surface temperature measurement is a requirement for each Standard and while there are differences in the thermocouples and pads used to measure temperature (as discussed earlier), our practical experience would say that unexposed surface temperatures measured with a UL10B thermocouple would be the same if slightly higher than an unexposed surface temperature measured with a copper disk thermocouple and that the UL10B thermocouple would probably be a more critical instrument for temperature measurement.

The maximum door movement measurements that a door must comply with during a fire test or a hose stream test are the same in either a UL 10B or a ASTM E 2074 test so a door that complies with UL10B will meet these same conditions of acceptance concerning door movement for ASTM E 2074.

No flaming was noted in the original Classification Report for Won-Door so the door assembly would comply with the Conditions of Compliance concerning flaming in ASTM E 2074 as well as those shown in UL 10B.

The main aspect of ASTM E 2074 that your door does not currently comply with is the cotton waste pad test as this was not required for a UL 10B test. The main reason we cannot say if it would comply or not is that since the test was not conducted, we do not have data to support an engineering judgement.

If you have any further questions about this type of testing, please do not hesitate to contact the undersigned.

With the issuance of this letter, our work on Project 04NK15140 has been completed and we will instruct our accounting department to close this Project.

Very Truly Yours,

Reviewed By:

Matthew Schumann

Robert Keogh

Matthew Schumann
Project Engineer
Fire Protection Division

Robert Keogh
Section Manager
Fire Protection Division

