



File R38491  
Project 4787027904

November 30, 2015

REPORT

on

ELECTRICALLY CONTROLLED LOCKS  
(GYQS/7)

GUANGDONG BE-TECH SECURITY SYSTEMS LIMITED  
Foshan, Guangdong, China

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GENERAL

This investigation was established to determine the fire rating of two new types of electrically controlled single-point locks installed in a single swinging-type fire door assembly. The electrically controlled lock was identified as the Models MORTISE S51 and S65.

The electrically controlled lock was evaluated in accordance with the Standard, "Positive Pressure Fire Test of Door Assemblies", ANSI/UL 10C (Second Edition, Feb 13rd, 2015), and Canadian National Standard CAN4-S104-10 (Fourth Edition, August 2015).

## TEST RECORD NO. 1

Test results relate only to items tested.

The fire exposure and hose stream tests were conducted in accordance with the Standards, "Positive Pressure Fire Test of Door Assemblies, ANSI/UL 10C (Second Edition, Feb 13rd, 2015), and Canadian National Standard CAN4-S104-10 (Fourth Edition, August 2015).

## TEST SAMPLES:

The test assembly consisted of a single swinging hollow metal type door that employed an electrically controlled lock assembly Model S65 and trim plate 7536M.

Testing of this assembly was considered representative of the other models including all single point locks and trim plates.

## CONSTRUCTION DETAILS:

## DOOR

The doors were designed for an opening 48 in width and 96 in height.

The door was constructed in accordance with UL Follow-Up Service Procedure File R27582 and was capable of bearing the UL Classification Mark. The door incorporated the appropriate reinforcements for the mounting of the hardware.

## FRAME

The frame in which the door was mounted was a UL Listed, pressed-steel type frame, manufactured from 1.4 mm cold rolled steel with 30 mm high stops. The frame was constructed in accordance with UL Follow-Up Service Procedure File R27655.

The appropriate latch and hinge reinforcements along with the attachment of masonry strap type anchors were provided.

## HARDWARE

Door Assembly incorporated an electrically controlled single-point lock assembly with a 15.9 mm latch throw. The lock assembly was identified as the Model MORTISE S65.

The door leaf was provided with four mortise type steel hinges of the ball bearing type, 114 mm high and 3 mm thick. The hinges were attached to the door and frame with screws.

## WALL

The door and frame assembly was installed into a 200 mm thick brick and concrete masonry unit wall.

## INSTALLATION:

The test assembly was built into the masonry wall contained within the test frame. The swinging doors were mounted so as to open into the furnace chamber.

## FIRE ENDURANCE TEST:

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

<u>Door Location</u>	<u>Average Clearance, mm</u>
Top of Door	3.7
Hinge Jamb	2.0
Latch Jamb	2.2
Bottom of Door	5.1

The general appearance of the exposed and unexposed surfaces of the test assembly prior to testing is shown in ILLS. 1 and 2, respectively.

## METHOD

Throughout the fire test, observations were made on the character of the fire, the condition of the unexposed surface and all developments pertinent to the performance of the door assembly as a fire retardant with special reference to stability, movement of operable components, development of through openings and flame passage of the lock assembly.

## RESULTS

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 specified in Par. 4 of the Standard, ANSI/UL 10C. The temperatures within the furnace chamber were controlled in accordance with the Standard Time-Temperature Curve as shown on ILL. 3.

The test was conducted with the neutral pressure plane located at 40 in. (1016 mm) above the bottom sill of the test assembly as required in Par. 7.1 of the Standard, ANSI/UL 10C. The location of the pressure tap probes and the measurements of the furnace pressure during the fire test are shown in ILL. 4.

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

Time, Hr:Min:s	Observations
00:02:00	FLAMES EVENLY DISTRIBUTED THROUGHOUT TEST ASSEMBLY
03:00:00	Gas off

The observations on the exposed and unexposed surfaces during the fire exposure were as follows:

Time, Hr:Min:s	Observations
00:00:00	Gas on;
00:01:35	Little smoke emitted from the clearance around the push plate discontinues;
00:18:30	Plastic of the push plat begin to melt and drop off;
00:40:00	Then, much smoke come out from the melt position of the plate.
00:57:00	Plate surface is oxidation and change color. Begin to distort.
01:30:00	The area of the unexposed door face close to the fire plate become to black;
01:45:00	Not any significant change;
02:00:00	Not any significant change;
03:00:00	Gas off, fire endurance test completed;

The test assembly withstood the fire endurance test, without developing openings through the assembly and remained in the opening during the fire endurance test. The latch bolt was engaged within the lock assembly.

## HOSE STREAM TEST:

## METHOD

Immediately after the 180 min fire exposure, the test assembly was withdrawn from the furnace and subjected to the impact and cooling effects of the 45 psi (310 kPa) hose stream for 1 min 36 s, as specified in the Standard, ANSI/UL 10C for a 3 h fire exposure.

## RESULTS

During the application of the hose stream, through openings were not present within the lock assembly. 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 during the classification period. The hardware held the doors closed in accordance with the conditions of acceptance for an exposure period of 3.0 hr. The latch was engaged. The lock was not operable after test.

## ENGINEERING STUDY:

The Model MORTISE S65 electrically controlled lock assembly described in this Report maintained its structural integrity throughout the 180 min's fire endurance test and maintains its structural integrity through and after the application of the 45 psi (310 kPa) hose stream. The performance of the lock assembly was within the "Conditions of Acceptance" specified in Standard, ANSI/UL 10C, hence the electrically controlled locks described herein are judged to be eligible for Listing and Follow-Up Service of UL LLC for 180 min fire rating with hose stream.

## INDEX OF ILLUSTRATIONS:

ILL. No.

- |   |  |
|---|--|
| 1 | Exposed Surface of the assembly, Pre-test                |
| 2 | Unexposed Surface of the assembly, Pre-test              |
| 3 | Plot of Furnace Temperatures                             |
| 4 | Plot of Furnace Pressures                                |
| 5 | Exposed Surface of the assembly, Post-fire test          |
| 6 | Unexposed Surface of the assembly, Post-fire test        |
| 7 | Exposed Surface of the assembly, Post-hose stream test   |
| 8 | Unexposed Surface of the assembly, Post-hose stream test |

TEST RECORD SUMMARY:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in UL Standard "Positive Pressure Fire Test of Door Assemblies", ANSI/UL 10C (Second Edition, Feb 13rd, 2015), and Canadian National Standard CAN4-S104-10 (Fourth Edition, August 2015).

Report by:

Maxwell Wen  
Associate Project Engineer  
Fire Protection Division

## CONCLUSION:

A sample of the products covered by this Report has been found to comply with the requirements covering the category and the products are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the sample investigated by UL and does not signify the product described as being covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the UL Listing Mark on such products, which comply with UL's Follow-Up Service Procedure and any other application requirements of UL. The Listing Mark of UL on the product, or the UL symbol on the product and the Listing Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Listing and Follow-Up Service.

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Maxwell Wen  
Associate Project Engineer  
Fire Protection Division