



Intertek
8431 Murphy Drive
Middleton, WI 53562

Letter Report No.: 101885036MID-001A

Report Date: 01/14/2015

**Grade 1 Performance Tests Of
Combi RB Mortise Cylinder**

RENDERED TO

**Rav-Bariach Industries Ltd.
31 Haofe St.
Ashkelon, Israel**

General

This report covers tests performed on the Combi RB mortise cylinder. These locks were tested in accordance with the Grade 1 performance requirements of UL 437 Standard for Safety, Key Locks Eighth Edition May 15th, 2013.

Description of Samples

The locks submitted for testing were identified by the client as the Model Combi RB. A complete description of the product tested can be found on page 3.

Test Methods

All tests were conducted in accordance with UL 437 Standard for Safety, Key Locks Eighth Edition, 2013.

Samples were mounted into blocks and fixtures where applicable, and subjected to tests for UL 437 requirements.

Samples Received: 11/20/2014

Intertek Sample Identification Code: MID1411201301

Test Results: Compliant

The Combi RB-Locks Mortise Cylinder was found to be Compliant with the requirements of UL 437, 2013.

The individual data sheets; pages 4 through 10 are attached to, and form a part of this report.

Initial tests conducted 12/5/2014 through 12/15/14. **Report revised 01/14/2015 to change client name from Standard Institute of Israel to Rav-Bariach Industries Ltd. as S.I.I. is a consulting firm for the manufacturer.**

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Product Photos



Product Description

Manufacturer: Combi RB Locks
Device Type: High Security Keyed Mortise Cylinder
Model: Combi RB
Operational Grade: 1

SUMMARY

Sections A156.25/(UL1034)	Test Description	Sample	Test Results
UL 437 Clause 4	Installation & Operation Instructions	1	Compliant
UL 437 Clause 5	General	1	Compliant
UL 437 Clause 7	Corrosion Protection	3	Compliant
UL 437 Clause 8	Key Changes	1	Compliant
UL 437 Clause 10	Endurance	3	Compliant
UL 437 Clause 11.6.1	Picking Test	1	Compliant
UL 437 Clause 11.9	Forcing Test	2	Compliant
UL 437 Clause 11.10	Drilling Test	4	Compliant
UL 437 Clause 11.11	Sawing Test	5	Compliant
UL 437 Clause 11.13	Pulling Test	6	Compliant
UL 437 Clause 11.14	Driving Test	7	Compliant
UL 437 Clause 12	Salt Spray Corrosion test	3	Compliant
UL 437 Clause 14	General Markings	1	Compliant

TEST DATA

4 Installation and Operating Instructions

4.1 A copy or draft of the installation and operating instructions intended to accompany each product or component, or equivalent information, is to be provided and used as a guide in the examination and test of the product or component.

4.2 The instructions shall include such directions and information as deemed by the manufacturer to be necessary for installation, operation, maintenance, and use of the product.

Method: Draft supplied that included installation and operating instructions.

Results: Compliant

CONSTRUCTION

5 General

5.1 The product shall be constructed so that it will operate when the intended key or keys are used.

5.2 The product shall be constructed for installation in a position or location that does not reduce the burglary resistant qualities.

5.3 The various parts shall be manufactured and assembled to maintain uniformity, particularly with regard to key bittings and tolerances.

5.4 Complete drawings of the construction of the product and specifications of material are to be provided for product investigation.

Method: Spec sheet supplied.

Results: Compliant

7 Corrosion Protection

7.1 All working parts of a lock mechanism shall be constructed of brass, bronze, stainless steel, or corrosion-resistant materials that have been determined to be equivalent, or shall have a protective finish complying with the Salt Spray Corrosion Test, Section 12.

Method: 96 hours in salt spray chamber. The product was tested every 24 hours for function.

Results: Compliant.

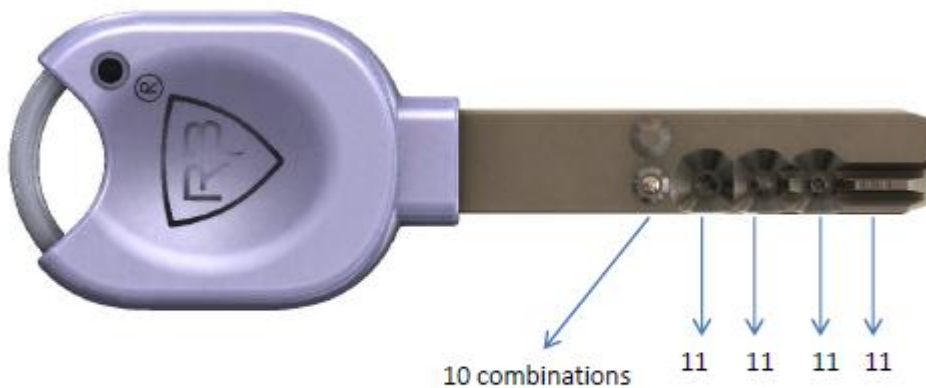
TEST DATA

8 Key Changes

8.1 For door locks and locking cylinders, there shall be at least 1000 key changes for a design. For security container key locks, there shall be at least one million key changes for a design. For two-key locks, there shall be at least 64 guard key changes, and at least 15,000 customer key changes for a design.

8.2 Data supporting a manufacturer's specification of the number of key changes, as well as a key chart showing the range of key cuts or bittings used in production, is to be furnished.

Method: Complete key chart and number of key changes supplied by manufacturer.
Key changes = 146,410.



$$10 \times 11 \times 11 \times 11 \times 11 = 146410$$

Results: Compliant

10 Endurance Test

10.1 A product shall operate as intended during 10,000 complete cycles of operation at a rate not exceeding 50 cycles per minute.

10.2 A product having a changeable core or field-changeable key design shall operate as intended after each of 50 changes of the core or key.

Method: Cylinder cycled for 10,000 cycles. Cylinder operated as intended at the conclusion of the endurance test.

Results: Compliant

TEST DATA

11 Attack Resistance Tests

11.6 Picking test

11.6.1 Picking tools are to be used in an attempt to align the tumblers, levers, wheels, or pins in order to open the lock.

Method: Cylinder picked with common picking tools for 10 minutes.

Results: Compliant

11.9 Forcing test

11.9.1 In an attempt to open the lock, rotary forces are to be applied with the test tools in the key slot, on the exposed part of the cylinder, and on the exposed portions of the lock assembly.

Method: Screwdriver and pliers used to attempt cylinder rotation for 5 minutes.

Results: Compliant.

11.10 Drilling test

11.10.1 A drill and drill bits are to be used to drill the plug, exposed body of the lock, or other parts of the lock assembly in an attempt to open the lock.

11.10.2 Drilling tests are to include the use of different size bits such as 1/8, 3/16, and 1/4 inch sizes. Tests may include the technique of reaming the material in the key way so the pins or tumblers can be exposed or removed from their location.

Method: Portable drill with 1/4" bit used in attempt to gain entry for 5 minutes.

Results: Compliant

11.11 Sawing test

11.11.1 A saw is to be used to cut the plug body of the cylinder, lock bolt, or other parts in order to remove or open the lock or lock assembly.

Method: Band saw used in attempt to gain entry for 5 minutes.

Results: Compliant

TEST DATA

11.13 Pulling test

11.13.1 Tools are to be used in an attempt to pull the plug, body of the lock, lock bolt, or other part in order to open the lock or lock assembly.

Method: Attempted to pull cylinder with various hand tools for 5 minutes.

Results: Compliant

11.14 Driving test

11.14.1 Tools are to be used in an attempt to drive the plug, body of the lock, lock bolt, or other part in order to open the lock or lock assembly.

Method: Hammer and cold chisel used in attempt to gain entry.

Results: Compliant

12 Salt Spray Corrosion Test

12.1 Products intended for outdoor use or not complying with the construction requirement in Corrosion Protection, Section 7, are to be subjected to a 96-hour exposure to salt spray (fog) as described in 12.2 – 12.5. Following this test, the products shall operate as intended.

12.2 The test specimens are to be supported vertically and exposed to salt spray (fog) as specified by the Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM B117. The apparatus used for salt spray exposure is to consist of a fog chamber, 48 by 30 by 36 inch (122 by 76 by 91 cm) inside dimensions, having a salt solution reservoir, a supply of compressed air, a dispersing tower for producing a salt fog, specimen supports, provision for heating the chamber, and necessary means of control. The dispersion tower is to be located in the center of the chamber and is to be supplied with salt solution and with warmed, humidified air at a pressure of 17 – 19 psi (117 – 131 kPa) so as to disperse the salt solution in the form of a fine mist or fog throughout the interior of the chamber. The temperature within the chamber is to be maintained between 33 and 36°C (91 and 97°F). Condensate accumulation on the cover of the chamber is not to be permitted to drop on the test specimens, and drops of the solution that fall from the specimens are not to be recirculated, but are to be removed through a drain located in the floor of the chamber.

12.3 Those parts of a key lock that would not be exposed when it is installed as intended are to be covered or sealed during the test.

12.4 The salt solution is to consist of 5 percent by weight of common salt (sodium chloride) and distilled water. The Ph value of this solution as collected after spraying in the test apparatus is to be between 6.5 and 7.2 and the specific gravity between 1.027 and 1.041 at 35°C (95°F).

12.5 During the 96-hour exposure, the product shall be operated once during each 24-hour period.

12.6 Following the exposure, the locks are to be allowed to dry for 24 hours in a room ambient atmosphere of 25°C (77°F).

Method: Exposed to salt spray test for 96 hours. Product tested for operation every 24 hours.

Results: Compliant

TEST DATA

MARKINGS

14 General

14.1 Each product shall be plainly and permanently marked at a location that is visible after installation with the following:

- a) Manufacturer's or private labeler's name or identifying symbol.
- b) Date of manufacture by week, month or quarter and year any of which may be abbreviated or in an established or otherwise traceable code. A date code marking shall be such that it does not repeat in less than 20 years.
- c) Model number or equivalent.
- d) Information necessary for the proper operation of the lock if the lock is provided with a special feature or is of the field-changeable key type.
- e) If a manufacturer produces a product at more than one factory, each product shall have a distinctive marking to identify it as the product of a particular factory.

Exception No. 1: The markings in (b) and (c) may be applied on the side or rear portion of the body of the lock.

Exception No. 2: The markings in (d) may be in separate instructions provided with the product.

Method: Markings meet requirements. Date code in "MMYY" format.

Results: Compliant