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Standard Specification for Youth-Resistant Firearms Containers (YRFCs)¹

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INTRODUCTION

This specification is intended to establish means of determining whether Youth Resistant Firearms Containers (YRFCs) adequately serve the purpose of deterring the unauthorized access to and use of firearms by youths. Subcommittee F15.55 on Youth-Resistant Firearms Containers (YRFCs) first issued the standard in 2004 at the request of the U.S. Consumer Product Safety Commission (CPSC) and others that ASTM publish a standard for Youth-Resistant Firearms Containers (YRFCs).

The subcommittee defined the scope of their work to develop a standard for those products. A single, minimum performance standard for all devices, as opposed to defining several “grades” or performance levels. Finally, the subcommittee focused on test methods that were objective, realistic, reliable, and repeatable.

1. Scope

1.1 This specification covers youth-resistant firearms containers (YRFCs), which are lockable containers that completely contain firearm(s) to prevent unauthorized access to firearm(s). These containers can be mechanical, electromechanical, or combination thereof. This specification:

1.1.1 Establishes a moderate security level for firearms storage intended to prevent youths from gaining unauthorized access to firearm(s); and

1.1.2 Establishes a consistent standard for testing and compliance certification.

1.2 This specification contains functional, operational, safety, and performance requirements for YRFCs.

1.3 This specification does not apply to transport-type firearm carrying cases, full-sized light gun cabinets, gun safes, high security gun safes, or container for firearms that exceed a length of 508 mm (20 in.).

1.4 This specification is intended to prevent unauthorized access to children up to and including age eleven.

1.5 This specification is not intended to:

1.5.1 Ensure theft resistance of the YRFC or the contents of the YRFC; or

¹ This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.55 on Firearm Security Containers.

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1.5.2 Ensure quick access to a firearm or assure long-term reliability of the YRFC operation to provide quick access to a firearm.

1.6 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.7 The following precautionary caveat pertains only to the test method portions of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D5025 Specification for Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials

3. Terminology

3.1 Definitions:

3.1.1 *action, n*—combination of the receiver or frame and breech bolt together with the parts of the mechanism by which a firearm is loaded, fired, and unloaded.

3.1.2 *barrel, n*—firearm component through which a projectile travels. May be rifled or smooth bore.

3.1.3 *code entry mechanism, n*—in a combination locking device, it is a dial, wheel, or buttons which allow the user to input a predetermined code to open the lock.

3.1.4 *combination locking device, n*—mechanical locking device designed to provide controlled opening of an YRFC by entry of a combination known only by an authorized user(s).

3.1.5 *compromised, adj*—circumstance in which the opening element of the YRFC may not be disabled, yet allows removal of the firearm block from the container by hand without the use of tools.

3.1.6 *digital locking device, n*—electromechanical lock that provides controlled opening of a YRFC by entry of a combination known only by an authorized user(s), or provides a means to read and validate a unique user attribute (as in biometric recognition devices), or both.

3.1.7 *disable, v*—defeating and opening the YRFC so as to allow removal of the firearm block.

3.1.8 *firearm, n*—a barrel and action from which a projectile is propelled through a deflagration (burning) of propellant.

3.1.9 *key, n*—an object intended by the manufacturer to be inserted into the keyway as a means to lock or unlock the locking device.

3.1.10 *key locking device, n*—mechanical or electromechanical locking device that requires a key or token to provide controlled opening of a YRFC.

3.1.11 *keyway, n*—opening in a key locking device that is shaped to accept a key.

3.1.12 *locking device, n*—a device that is integral to the YRFC that locks and unlocks the YRFC.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.1.13 *manipulation, n*—process of code testing a combination in an attempt to cause the locking device to open.

3.1.13.1 *Discussion*—

Manipulation can represent random or methodical code entry attempts or mechanical interpretation of lock reaction to code entry, or both, in which the lock may provide measurable or tactile feedback to code input.

3.1.14 *opening element, n*—component of the YRFC that is opened (door, lid, and so forth) to access and remove the firearm contained inside.

3.1.15 *token, n*—small portable key-like electronic device that provides a unique digital serial number or signature and acts as a suitable secure substitute for conventional mechanical keys.

3.1.15.1 *Discussion*—

Tokens can transmit a signature by direct electrical connection or via wireless communications techniques (light transmission, radio frequency transmission, vibration, magnets, and so forth).

3.1.16 *youth, n*—child eleven years old or younger.

3.1.17 *youth-resistant firearms container (YRFC), n*—lockable security container designed to contain firearm(s) completely and to prevent youths from gaining access to firearm(s).

4. Calibration and Standardization

4.1 All tests shall be conducted within the following tolerances as applicable:

4.1.1 All tests shall be conducted at temperatures between ~~16~~16 °C and ~~27~~27 °F (~~61~~27 °C (61 °F and 81 °F):81 °F).

4.1.2 All tests shall be conducted with relative humidity between ~~30~~30 % and 95 %.

4.2 Test specimens shall mechanically represent the exact product intended for sale to the public.

4.2.1 Cosmetic product modifications or changes are allowed, provided they do not alter the product's mechanical attributes.

4.3 One technician conducts testing for any single test.

4.4 The testing technician or laboratory staff, or both, shall not open the test specimens for inspection before any testing.

4.5 The testing technician shall not consult with other laboratory staff or observers as it relates to the techniques and methods used in the testing.

4.6 Test specimens shall not be anchored, clamped, or otherwise immobilized to conduct testing, except where specified.

4.7 A wooden firearm block shall be used to represent a firearm for placement inside the YRFC. The YRFC manufacturer shall produce and install these blocks in each specimen before submission for testing.

4.8 Test specimens shall be delivered to the testing laboratory in a locked condition with a firearm block inside each specimen.

4.9 If a test results in disabling or compromising a test specimen, the testing technician shall not inspect the failed specimen to gain knowledge for use in subsequent tests.

4.10 Retesting of a single failed test is allowed to complete a certification of compliance. Retesting does not require rerunning tests previously resulting in a passing result.

5. General Requirements

5.1 Removal of the contents of the YRFC shall be prevented, except by use of a key, combination, or other unique method, or a combination thereof, as defined by the instructions accompanying the YRFC. In the case of biometric recognition features, these are programmed into the YRFC by the authorized user(s) prior to use in accordance with the manufacturer's instructions.

5.2 Key locking devices shall be constructed to operate when the intended key(s) or token(s) are used and shall meet the following additional requirements:

5.2.1 Key locking devices that use a key shall have a minimum of 130 unique key configurations

5.2.2 Key locking devices that use a token shall provide a minimum of 10 000 possible serial numbers or signatures.

5.2.3 The operability of each YRFC shall be limited to only one key configuration.

5.2.4 Creating a key or token that unlocks all key locking devices is prohibited, as it provides more than one key or token to operate the key locking device.

5.3 A combination locking device shall meet the following additional requirements:

5.3.1 The code entry mechanism shall provide a minimum of 1000 possible combinations with at least three characters or input steps in a combination.

5.3.2 Combination locking devices that support multiple users shall provide 1000 possible combinations per user.

5.4 A digital locking device shall meet the following additional requirements:

5.4.1 A digital locking device shall require the dialing or input of a combination providing a minimum of 1000 possible combinations with at least four characters or input steps in a combination.

5.4.2 Digital locking devices that support multiple users shall provide 1000 possible combinations per user.

5.4.3 Digital locking devices shall provide a penalty lockout feature to prevent rapid code testing. The minimum penalty lockout period is 2 minutes for every five incorrect entry attempts.

5.4.4 Digital locks that utilize biometric recognition locks shall provide ample identification data points or resolution to allow access to no more than 1 in 10 000 possible users.

5.4.5 Digital locks may provide a "back door" for service, but this combination shall provide a minimum of 1 in 100 000 possible combinations.

5.5 Digital locking devices with biometric recognition lock features shall be received by the user in a condition such that locks shall not open with the biometric entry method until the authorized user programs a unique biometric method into the YRFC.

6. Performance Requirements

6.1 *Cycle Requirements:*

6.1.1 The YRFC shall be subjected to the cycle testing in 7.1.

6.1.2 Failure occurs if the YRFC does not open or lock according to the manufacturer's intended means of operation.

6.2 *Picking Requirements:*

6.2.1 The YRFC shall be subjected to the picking testing in 7.2.

6.2.2 Failure occurs if the locking device is disabled, causing the YRFC to open and allowing removal of the firearm block.

6.2.3 This test does not apply if the YRFC does not have a keyway or access point(s) that provide tool insertion.

6.3 *Torque Test for Keyway YRFC:*

6.3.1 The YRFC shall be subjected to the torque testing in 7.3.

6.3.2 Failure occurs if the locking device is disabled, causing the YRFC to open and allowing removal of the firearm block.

6.3.3 This test does not apply if the YRFC does not have a keyway or access point(s) that provide tool insertion.

6.4 *Manipulation Requirement for Combination or Digital YRFC:*

6.4.1 The YRFC shall be subjected to the manipulation testing in 7.4.

6.4.2 Failure occurs if the combination or digital locking device is disabled during the 2 minutes of manipulation, causing the YRFC to open and allowing removal of the firearm block.

6.4.3 This test does not apply if the YRFC does not have a combination or digital locking device.

6.5 *Handle Torque Requirements:*

6.5.1 The YRFC shall be subjected to the manipulation testing in 7.5.

6.5.2 Failure occurs if the locking device is disabled, causing the YRFC to open and allowing removal of the firearm block.

6.5.3 This test does not apply if the YRFC does not have a handle.

6.6 *Impact Requirements:*

6.6.1 The YRFC shall be subjected to the drop testing in 7.6.

6.6.2 Products that weigh more than 25 kg (55 lb) shall not be subject to drop testing.

6.6.3 Failure occurs if the YRFC is disabled or compromised, or can be opened or compromised without tools (by hand) within 1 minute after the test is completed and the drop fixture is removed.

6.7 *Opening Element Tensile Strength Requirements:*

6.7.1 The YRFC shall be subjected to a tensile strength test in 7.7.

6.7.2 The YRFC is exempt from tensile strength testing if the opening element has no points of attachment or exposed edge to pull upon.

6.7.3 Failure occurs if the YRFC is disabled or compromised, or can be opened or compromised without tools (by hand) within 1 minute after the test is completed and the attachment device is removed.

6.7.4 If the tool's attachment point breaks off or fails during the test, the YRFC is judged as passing this test.

6.8 *Shock Requirements:*

6.8.1 The YRFC shall be subjected to a shock test in 7.8.

6.8.2 Failure occurs if the YRFC is disabled or compromised or can be opened or compromised without tools (by hand) within 1 minute after the test is completed.

6.9 *Saw Requirements:*

6.9.1 The YRFC shall be subjected to a saw cutting attack test in 7.9.

6.9.2 Failure occurs if the YRFC is disabled or compromised, or can be opened or compromised without tools (by hand) within 15 s after the test is completed.

6.10 *Prying Requirements:*

6.10.1 The YRFC shall be subjected to a pry attack test in 7.10.

6.10.2 Failure occurs if the YRFC is disabled or compromised.

6.11 *Hinge Requirements:*

6.11.1 The YRFC will be subjected to a hinge attack test in 7.11.

6.11.2 This test does not apply if the YRFC does not have an exposed hinge or hinge components.

6.11.3 Failure occurs if the YRFC is disabled or compromised.

6.12 *Flammability Requirements:*

6.12.1 The YRFC shall be subjected to a flammability test in 7.12.

6.12.2 Failure occurs if the YRFC is disabled or compromised, or can be opened or compromised without tools (by hand) within 1 minute after the test is completed.

7. Test Methods

7.1 *Cycle Test:*

7.1.1 *Test Equipment:*

7.1.1.1 The test specimen shall be provided with the key, token, digital code, or combination for cycle testing.

7.1.2 *Test Procedure:*

7.1.2.1 The opening element shall be opened and closed 100 cycles. A cycle consists of unlocking and fully opening followed by closing and locking.

7.2 *Picking Test:*

7.2.1 *Test Equipment:*

7.2.1.1 A metallic paper clip made of 1.02 mm (0.040 in.) diameter wire.

7.2.1.2 A metallic paper clip with a 0.8 mm (0.03 in.) diameter wire.

7.2.1.3 A flat tipped screwdriver which has a shank with a diameter that fits within the entire depth of the keyway.

7.2.1.4 A stopwatch capable of measuring a 2-minute time period.

7.2.2 Test Procedure:

7.2.2.1 Attempt to pick and open the firearm locking device with the use of the 1.02 mm (0.04 in.) diameter paper clip for a total of 2 minutes. It is permissible to bend the wire of the paper clip into any shape needed. Time shall be counted only while the paper clip is in contact with the firearm locking device.

7.2.2.2 Attempt to pick and open the firearm locking device with the use of the 0.8 mm (0.03 in.) diameter paper clip for a total of 2 minutes. It is permissible to bend the wire of the paper clip into any shape needed. Time shall be counted only while the paper clip is in contact with the firearm locking device.

7.2.2.3 Attempt to pick and open the firearm locking device with the use of the screwdriver that will fit in the keyway for a total of 2 minutes. Time shall be counted only while the screwdriver is in contact with the firearm locking device.

7.3 Keyway Torque Test:

7.3.1 Test Equipment:

7.3.1.1 A supporting fixture such as a vice.

7.3.1.2 A torque wrench capable of measuring 10 N-m (89 in.-lbf).

7.3.1.3 A flat tip screwdriver that will penetrate the full depth of the keyway.

7.3.2 Test Procedure:

7.3.2.1 Install the YRFC in a rigid fixture, such as a vice, to support it firmly but not to restrict free rotation of the keyway.

7.3.2.2 Insert a screwdriver with the largest flat blade (but not to exceed $\frac{5}{8}$ in. or 16 mm) that will fit into the keyway.

7.3.2.3 Apply a torque load of 10 N-m (89 in.-lbf).

7.4 Manipulation Test:

<https://standards.iteh.ai/catalog/standards/sist/c0341173-3ff7-4e91-8447-4335cdc2d7bb/astm-f2456-20>

7.4.1 Test Equipment:

7.4.1.1 A stopwatch capable of measuring a 2-minute time period.

7.4.2 Test Procedure:

7.4.2.1 For a combination locking device, manipulate the code entry mechanism by entering codes or combinations by hand for a total of 2 minutes. Manipulation is limited to the code entry mechanism. Time shall be counted only while hands are manipulating the combination locking device.

7.4.2.2 For a digital locking device, manipulate the locking device by entering random codes or combinations by hand or by attempting to enter a unique user attribute for a total of 2 minutes. Manipulation is limited to the locking device. Time shall be counted only while hands are manipulating the digital locking device.

7.5 Handle Torque Test:

7.5.1 Test Equipment:

7.5.1.1 A gage suitable for measuring the applied torque of 10 N-m (89 in.-lb) and a suitable tool to apply torque to the handle.

7.5.1.2 A mechanical means to anchor the YRFC which will not distort, deform, or reinforce the container.

7.5.2 Test Procedure: