



**STANDARD
FOR
RESIDENTIAL LOCKSETS AND LATCHES**



SPONSOR

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.

AMERICAN NATIONAL STANDARD INSTITUTE

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AMERICAN NATIONAL STANDARD
(This is not a part of ANSI/BHMA A156.39)

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FOREWORD

(This Foreword is not a part of ANSI/BHMA A156.39)

The general classification of builders hardware includes a wide variety of items which are divided into several categories. To recognize this diversity, a sectional classification system has been established. Locks and Lock Trim is one such section and this Standard is the result of the collective efforts of members of the Builders Hardware Manufacturers Association, Inc. who manufacture these products. The total Product Standards effort is therefore a collection of sections, each covering a specific category of items.

Performance tests and, where it has been necessary, dimensional requirements have been established to insure safety, security and stability to which the public is entitled. Performance criteria for resistance to surreptitious and forceful attack are not fully covered. There are no restrictions on design except for those dimensional requirements imposed for the reasons given above. It is also required that locks fit certain cut-out dimensions.

This Standard is not intended to obstruct but rather to encourage the development of improved products, methods and materials. The BHMA recognizes that errors will be found, items will become obsolete, and new products and methods will be developed. With this in mind, the Association will update, correct and revise these Standards on a regular basis. It shall also be the responsibility of manufacturers to request such appropriate revisions.

Bored Residential locks have been described in three grade levels (A,B,C) related to Durability, Security, Finish performance. Choice of grade and specific products are made on the basis of utility, aesthetics, security objectives and end use required.

The BHMA numbers which indicate functions of locks and latches do not identify grade, finish or design and are not intended to be used without necessary supplementary information. Individual manufacturer's catalogs are to be consulted.

Users of this Standard consult applicable local building codes as to requirements affecting the functions of locks used on fire doors and doors within a means of egress. Only functions compatible with the requirements of the applicable building codes are used.

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1. SCOPE

1.1 This Standard establishes performance requirements for bored residential locksets and latches, and includes durability, security, and finish. Residential locksets and latches are generally used for single family homes and multifamily dwellings.

1.2 Tests described in this Standard are performed under laboratory conditions. In actual usage, results vary because of installation, door and frame construction, maintenance and environmental conditions.

1.3 When locks and latches are used in fire door assemblies, they shall have been tested and listed for use in fire doors by a Nationally Recognized Testing Laboratory (NRTL) and shall be under an in-plant follow-up inspection service.

1.4 Tests to evaluate decorative and protective finishes for these products are described in ANSI/BHMA A156.18 for Materials and Finishes and are required to complete certification.

2. DEFINITIONS

2.1 **Auxiliary Dead Latch** A plunger which, when actuated, automatically locks a projected latch bolt against return by end pressure.

2.2 **Backset** The distance from the edge of the door measured at the centerline of the door thickness to the centerline of the cylinder or spindle.

2.3 Bolts

2.3.1 **Latch Bolt** A lock component having a beveled end which projects from the lock front in its extended position, but is forced back into the lock case by end pressure or drawn back by action of the lock mechanism. When the door is closed, the latch bolt projects into a hole provided in the strike, holding the door in a closed position.

2.3.2 **Dead Locking Latch Bolt** A type latch bolt incorporating a plunger which, when depressed, automatically locks the projected latch bolt against return by end pressure. Also called dead latch.

2.4 Cylinders

2.4.1 **Cylinder** The subassembly of a lock containing a plug with a keyway and cylinder body with detainer mechanism.

2.4.2 **Cylinder Body** The portion of a cylinder that surrounds the plug and contains the detainer mechanism.

2.4.3 **Cylinder Plug** A component of the cylinder within the body which is actuated when the correct key is inserted.

2.4.4 **Interchangeable Core Cylinder** A cylinder that is removable from the lock with a designated key without disassembly of the lock.

2.5 **Lever Catch** Also called knob catch. The retainer which engages the lever in order to maintain its attachment to the lever spindle.

2.6 **Lock Front** A plate fastened to the edge of a door through which the bolt(s) pass.

2.7.1 **Bored Residential Lock Series 4000** A lock installed in a round bored opening in the edge and face of a door.

2.8 **Operating Trim** Lock components including levers, knobs, paddles, or handlesets and equivalent components.

2.9 Push Button and Related Terms

2.9.1 **Push Button Code Mechanism** A mechanism used in place of, or in conjunction with a key and cylinder.

2.9.2 **Push Button** A single inside locking device that when depressed, locks the outside operating trim.

2.9.3 **Turn Button** A single inside locking device that when rotated, locks the outside operating trim.

2.9.4 **Combination Push Button/Turn Button** A single inside locking device that when depressed, locks the outside operating trim, or when depressed and rotated maintains the locked state.

2.10 **Indicator Button** The component of a hotel guest room lock which when activated, indicates on the outside that the room is occupied.

- 2.11 **Spindle** A lock component which transfers operating trim rotation to the lock mechanism.
- 2.12 **Strike** A mortised or surface mounted plate fastened to the door frame into which the bolts project.
- 2.13 **Strike Box** A housing used in back of a strike to enclose the bolt or bolt openings.
- 2.14 **Thumb Piece** A lever projecting from a handle pressed by the thumb to retract a latch bolt.

3. GENERAL

3.1 **Cylinders** Residential locksets supplied and mated with cylinders shall be tested as a complete product per the requirements of this standards. When cylinders supplied or mated with residential locksets are certified for the appropriate cylinder types and grade level found in the ANSI/BHMA Standard A156.5-2019 for Cylinders and Input Devices, various tests may be omitted as clarified in section 8.9. Assemblies take the grade level of the lowest graded component. Other mechanisms are permitted to be used in lieu of cylinders providing the performance and security criteria are equivalent to that of cylinders. Suffix D cylinders shall be indicated in the certified products directory for locks to be used only with drill resistance cylinders as evaluated in A156.5.

3.2 **Residential Grade Qualifications** Manufactures shall display the lock grade levels and the Secure Home website address, "www.SecureHome.org", on retail packaging. Lock grade levels are indicated using three distinct categories (Security, Durability and Finish) in accordance with the BHMA SecureHome™ Label program.

3.3 **Grade Qualifications** Three categories of tests are described in this Standard: Security, Durability, and Finish. Locks shall meet all tests for their grade listing for each of the categories independently. A Grade A lock for a specific category shall meet all Grade A criteria for that category, and a Grade B lock for a specific category shall meet all Grade B criteria for that category, and a Grade C lock for a specific category shall meet all Grade C criteria for that category.

3.4 No lock can provide complete security by itself. Locks may be defeated by forcible or technical means, or evaded by entry elsewhere on the property. No lock can substitute for caution, awareness of your environment, and common sense. Builder's hardware is available in multiple performance grades to suit the application. In order to enhance security and reduce risk, consult a qualified locksmith or other security professional. For applications where pick resistance and other higher security protections are required users should consider locks meeting UL 437 or ANSI/BHMA A156.30 for High Security Cylinders.

3.5 **Operating Trim** Where levers are referenced, knobs, paddles, or handlesets are permitted to be used.

3.6 **Trim.** Roses, escutcheons, knobs, levers, turns, paddles, cylinder guards shall cover all door preparation openings.

3.7 **Reference to Other Standards.** The following Standards are referenced within: ASTM F476-84 (R2014) Security Tests for Swinging Door Assemblies; ANSI/BHMA Standard A156.5-2020 for Cylinders and Input Devices, ANSI/BHMA Standard A156.18 2020 for Materials and Finishes, ANSI/BHMA A156.25-2018 for Electrified Locking Devices and. ANSI/BHMA A156.115-2016. ANSI Standards are available from BHMA, www.buildershardware.com. ASTM Standards are available from www.astm.org.

3.8 **Values.** Required values in this Standard are given in US units. The SI (metric) equivalents are approximate.

3.9 **Door and Frame Preparation** The lock models described in this standard shall fit the door and frame preparations described in the ANSI/BHMA A156.115 Series. Other configurations are permitted to fit special opening templating requirements. See manufacturers' instructions for details.

3.10 **Building Codes** Certain lock functions described in this standard are not permitted on doors within a means of egress. Consult local authority having jurisdiction. When locks and latches are used in fire door assemblies, they shall have been tested and listed for use in fire doors by a Nationally Recognized Testing Laboratory (NRTL) and shall be under an in-plant follow-up inspection service.

3.11 **Electrified Input Devices** shall meet the applicable requirements of ANSI/BHMA A156.5.

4. DIMENSIONAL CHARACTERISTICS

4.1 **Latch bolt projection:** minus 1/16 in (1.6 mm) tolerance.

4.1.1 **Series 4000** with dead locking latch bolts. Series 4000 bored residential locks and latches are available in Grades A, B and C. All Grades: ½ in (12.7 mm) except with latch bolts that are not dead locking:

All Grades Deadlatching:	1/2 in (12.7mm)
All Grades Non-Deadlatching:	3/8 in (10 mm)

4.1.2 Additional latch bolt projections exceeding those required are available. Consult individual manufacturers' catalogs.

4.2 **Knob diameter:** 1 in (25.4 mm) minimum

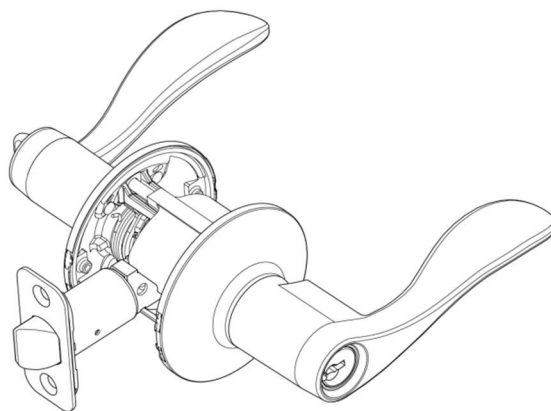
4.3 **Backset:** ± 1/64 in. (0.4 mm) 2 3/8 in. or 2 3/4 in. (60 mm or 70 mm)

Other backsets are permitted to be used providing the performance and security are equivalent.

4.4 **Tolerances** All values which do not carry specific tolerances or are not marked maximum or minimum shall have the following tolerances: Linear dimensions shall be ± 1/16 in (1.6 mm). Weight or force shall be ± 2%. Angles shall be ± 2 degrees. Where only minus tolerances are given, the dimensions are permitted to be exceeded at the option of the manufacturers.

5. DESCRIPTION AND FUNCTION NUMBERS OF SERIES 4000 BORED RESIDENTIAL LOCKSETS AND LATCHES

Typical Bored Lock



5.1 In the following bored lock descriptions, the functions are described using lever trim for brevity and clarity. Models with knobs, paddles, thumbpieces, or turnpieces, offered by some manufacturers for certain functions are also permitted. Where keys or cylinders are referenced, other input devices are permitted. See ANSI/BHMA A156.5 for Cylinders and Input Devices. Some functions may be available with electrical operation in place of mechanical operation. See ANSI/BHMA A156.25 for Electrified Locking Devices. The basic function shall remain the same as described.

5.2 The latch bolt and its related working parts shall be contained in a factory assembled unit which shall connect with at least one of the lever or knob assemblies or retractor assembly. The unit passing through the cross bore of the door shall be firmly clamped or fastened to the door by the roses or rose subassemblies. Lock sets shall permit centering of assemblies at installation on doors within the thickness range given.

5.3 **Function Number Tests** See Chart 1 in appendix for summary of tests by function.

5.4 Function Descriptions

F75 Grades A , B, C Passage or Closet Latch. Latch bolt operated by lever from either side at all times.

F76A Grades A, B, C Privacy, Bedroom or Bath Lock. Latch bolt operated by lever from either side. Outside lever is locked by push button or other locking device inside and unlocked by emergency release outside, operating inside lever or closing door.

F76B Grades B, C Privacy, Bedroom or Bath Lock. Latch bolt operated by lever from either side except when outside lever is locked by locking device inside. Locking device shall automatically release when inside lever is operated or be in unlocked position before inside lever is operated. Emergency release on outside shall permit outside lever to operate latch bolt.

F77A Grades A, B, C Patio or Privacy Lock. Dead locking latch bolt operated by lever from either side. Outside lever is locked by push button or other locking device inside and unlocked by operating inside lever or closing door. Do not use on doors in rooms that have no other entrance.

F77B Grades B, C Patio and Privacy Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by locking device inside. Locking device shall automatically release when inside lever is operated or be in the unlocked position before the lever is operated. Do not use on doors in rooms that have no other entrance.

F81 Grades A, B , C Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by turn button or other locking device inside. When outside lever is locked, latch bolt is operated by key in outside lever or by operating inside lever. Turn button or other locking device shall be manually operated to unlock outside lever. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

F82A Grades A, B, C Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by push button or other locking device on inside. When outside lever is locked, operating key in outside lever or operating inside lever unlocks push button or other locking device and retracts latch bolt. Closing door does not release push button or other locking device.

F82B Grades B, C Entry Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by locking device on inside. When outside lever is locked, operating key in outside lever unlocks locking device. Locking device shall automatically release when inside lever is operated or be in the unlocked position before inside lever is operated.

F83 Grades A, B, C Exit Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by turn button or other locking device in inside. Turn button or other locking device shall be manually operated to unlock outside lever. Inside lever always operates latch bolt.

F84 Grades A, B, C Classroom Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked from outside by key. At the option of the individual manufacturer, operating the key in the lever shall permit the latch bolt to be retracted. When outside lever is locked, latch bolt is operated by inside lever.

F86 Grades A, B, C Store Room or Closet Lock. Dead locking latch bolt operated by key in outside lever, or by operating inside lever. Outside lever is always inoperable. At the option of the individual manufacturer, operating the key in the outside lever shall permit the latch bolt to be retracted by operating the outside lever, providing the key cannot be removed in the unlocked position.

F88 Grade A Apartment, Exit or Public Toilet Lock. Dead locking latch bolt operated by lever from either side except when outside lever is locked by key from inside. When outside lever is locked, latch bolt is retracted by key in outside lever or by operating inside lever.

F89 Grades A, B, C Exit Latch. Dead locking latch bolt retracted by lever from inside at all times. Outside lever is always inoperable.

F94 Grades A, B, C Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by push button or other locking device on inside. When outside thumb piece is locked, operating key in outside cylinder or operating inside lever retracts latch bolt. Closing door does not release push button or other locking device.

F107 Grade A Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by push button or other locking device on inside. When outside thumb piece is locked, operating key in outside cylinder or operating inside lever unlocks push button or other locking device and retracts latch bolt. Closing door does not release push button or other locking device.

F108 Grades B, C Entry Handleset. Dead locking latch bolt operated by thumb piece from outside and lever from inside except when outside thumb piece is locked by locking device on inside. When outside thumb piece is locked, operating key in outside cylinder unlocks locking device. Locking device shall automatically release when inside lever is operated or be in the unlocked position before inside lever is operated.

F111 Grades A, B, C Communicating Passage Lock Dead locking latch bolt operated by lever one side only at all times. Non removable blank trim or no trim outside.