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**RECOMMENDED PRACTICES for
MECHANICAL KEYING SYSTEMS**



**SPONSOR
BUILDERS HARDWARE MANUFACTURERS ASSOCIATION, INC.**

**AMERICAN NATIONAL STANDARDS INSTITUTE
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FOREWORD (This Foreword is not a part of ANSI/BHMA A156.28)

The general classification of builders hardware includes a wide variety of items which are divided into several categories including Cylinders and Auxiliary Locks, Section E. This Recommended Practice 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.

This Standard Practice 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 should also be the responsibility of manufacturers to request such appropriate revisions.

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1. SCOPE

This recommended practice is intended for building owners, security professionals and others responsible for designing, implementing, and maintaining secure keying systems.

It covers system design, to provide design criteria to establish and maintain a secure keying system.

The purpose of this document is to provide guidelines for the essential keying conference, establish good practices for effective key management and give building owners the ability to extend the life of keying systems to meet future demands, maintain security and reduce expenses.

2. GENERAL

Master keying is the process of combining a group of locks or cylinders, so that each is operated by its own change key as well as by a master key for the entire group. This process reduces security in pin tumbler lock cylinders by making them more susceptible to lock picking and by increasing the number of unintended and intended keys which may operate them.

A master key system stands little chance of serving the end user's needs if it is not properly planned from its inception. The end user must be involved in planning and approving the keying system. The keying conference is the principal element of this process and its importance must not be minimized. The end user's designated personnel or representative(s) with the proper level of authority over the final keying system must be present at this meeting.

Use cylinders manufactured and certified to ANSI/BHMA A156.5 and/or ANSI/BHMA A156.30 in the BHMA Certified Products Directory, to ensure consistent performance, durability and appropriate level of protection.

3. DEFINITIONS

3.0 The following definitions are taken from The Professional Glossary of Terms Relating to Cylinders, Keys and Master Keying, copyright 1982 – 1998 by the Lock Industry Standards and Training (LIST) Council and the ALOA Sponsored National Task Group for Certified Training Programs.

3.1 **Bitting** The numbers which represent the dimensions of the key cut; or the actual cuts or combination of a key.

3.2 **Bow** The portion of a key which serves as a grip or handle.

3.3 **Change Key** A key which operates only one cylinder or one group of keyed alike cylinders in a keying system.

3.4 **Concealed Key Control (CKC)** A specification that all lock cylinders be marked with standard keying symbols in a location which is concealed while the cylinder is installed.

3.5 **Combine** To set a combination in a lock, cylinder or key.

3.6 **Combination** The group of numbers which represent the bitting of a key and/or the tumblers of a lock or cylinder.

3.7 **Control Key** A key whose only purpose is to remove or install an interchangeable or removable core.

3.8 Construction Keys and Related Information

3.8.1 Construction Core An interchangeable or removable core designed for use during the construction phase of a building. The cores are normally keyed alike and, upon completion of construction, they are to be replaced by the permanent system's cores.

3.8.2 Construction Master Key A key normally used by construction personnel for a temporary period during building construction. It may be rendered permanently inoperative without disassembling the cylinder.

3.8.3 Construction Master Keying This applies to conventional cylinders, not interchangeable or removable cores. The permanent cylinders are installed during construction and are operated by Construction Master Keys. Upon permanent occupancy, the construction keys are typically cancelled by one of two methods, "lost ball" and "split key."

3.8.4 Temporary Cylinders Typically keyed alike, may be used during construction. The temporary cylinders are replaced by the permanent cylinders when the building is ready for occupancy. Temporary cylinders will have the keying capacity and other characteristics of the specified product and may avoid adverse effects on system capacity with other methods.

3.9 Credentials The key media containing the combination code that identifies a user.

3.10 Cross Keying The deliberate process of combining a cylinder (usually in a master key system) to two or more different keys which would not normally be expected to operate together.

3.11 Declining Step Key A key whose cuts are progressively deeper from bow to tip.

3.12 Decoding Obtaining the dimensions of a key or cylinder without disassembling the cylinder.

3.13 Depth Key Set A set of keys used to make a code original key on a key duplicating machine to a lock manufacturer's given set of key biting specifications. Each key is cut with the correct spacing to one depth only in all biting positions, with one key for each depth.

3.14 Effective Changes Differences between cylinders of similar designs, achieved only by the movable detainer, which allows each cylinder to be operated only by its own key. The number of effective changes is equal to the number of theoretical changes after deduction of the changes suppressed by the manufacturer due to technical constraints. Also called differs.

3.15 Grand Master Key (GMK) The key which operates two or more separate groups of locks, each operated by a different master key.

3.16 Grand Master Key System A master key system which has exactly three levels of keying.

3.17 Great Grand Master Key (GGMK) The key which operates two or more separate groups of locks, which are each operated by a different grand master key.

3.18 Great Grand Master Key System A master key system which has exactly four levels of keying.

3.19 Incidental Master Key A key cut to an unplanned shear line created when the cylinder is combined to the top master key and a change key.

3.20 Key A properly combined device which is, or most closely resembles, the device specifically intended by the lock manufacturer to operate a corresponding lock.

3.21 Keyway The opening in a lock or cylinder which is shaped to accept a key bit or blade of a proper configuration; or, the exact cross sectional configuration of a keyway as viewed from the front.

3.22 Key Control System. A group of components enabling the user to contain and control the use of keys in an orderly and secure manner. The components include means of storage, identifying tags and record keeping materials.

- 3.23 Keyed Alike (KA)** Of or pertaining to two or more locks or cylinders which have or are to have the same combination. They may or may not be a part of a keying system.
- 3.24 Key Blank** Any material manufactured to the proper size and configuration, which allows its entry into the keyway of a specific locking device. A key blank has not yet been combined or cut.
- 3.25 Keying Conference** A meeting of the end user and the key system supplier at which the keying and levels of keying, including future expansion, are determined and specified.
- 3.26 Keyed Different (KD)** Of or pertaining to a group of locks or cylinders, each of which is or is to be combined differently from the others. They may or may not be part of a keying system.
- 3.27 Key Interchange** An undesirable condition, usually in a master key system, whereby a key unintentionally operates a cylinder or lock.
- 3.28 Key Section** The exact cross sectional configuration of a key blade as viewed from the bow toward the tip.
- 3.29 Key Symbol** A designation used for a key combination in the standard key coding system, e.g., A, AA, AA1, etc.
- 3.30 Master Key (MK)** 1. A key which operates all the master keyed locks or cylinders in a group, each lock or cylinder usually operated by its own change key. 2. To combine a group of locks or cylinders such that each is operated by its own change key as well as by a master key for the entire group.
- 3.31 Master Key System** 1. Any keying arrangement which has two or more levels of keying. 2. A keying arrangement which has exactly two levels of keying.
- 3.32 Multiplex Key System** 1. A series of different key sections, which may be used to expand a master key system by repeated bittings on additional key sections. The keys of one key section will not enter the keyway of another key section. This type of system always includes another key section which will enter more than one or all the keyways. 2. A keying system which uses such keyways and key sections.
- 3.33 Multi-Keyway System** See Multiplex Key System
- 3.34 NMK** A keying symbol which means "not master keyed" and may be suffixed in parentheses to the regular key symbol. It indicates that the cylinder is not to be operated by the master key(s) specified in the regular key symbol; e.g. AB6(NMK).
- 3.35 Progression** A logical sequence of selecting possible key bittings, usually in numerical order from the key biting array.
- 3.36 Selective Master Key** An unassociated master key which can be made to operate any specific lock(s) in the entire system in addition to the regular master key(s) and or change key(s) for the cylinder without creating key interchange.
- 3.37 Shear Line** A location in a cylinder at which specific tumbler surfaces must be aligned, removing obstruction(s) which prevented the plug from moving.
- 3.38 SKD** Symbol for single keyed, normally followed by a numerical designation in the standard key coding system; e.g. SKD 1, SKD 2, etc. It indicates that a cylinder or lock is not master keyed, but is part of the keying system.
- 3.39 Theoretical Key Changes** The total possible mathematical biting combinations, usually reduced in practice.
- 3.40 Top Master Key (TMK)** The highest level master key in a master key system.
- 3.41 Visual Key Control (VKC)** A specification that all keys and the visible portion of the front of all lock cylinders be marked with standard keying symbols.