The Evolution of High-Security Locking Systems:
What You Need to Know Today

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The face of security is changing — almost daily. With the prevalence of electronic security, including card, code and biometric authentication systems controlling and monitoring access, are high security mechanical locking systems still relevant or even necessary?

You'll find in this smart paper:
1. The Role of High-Security Locks in Electronic Access Control Systems
2. The Five Essential Criteria for a High-Security Locking System
3. Overview of Medeco's Newest M4 High-Security Locking System

The Role of High-Security Locks in Electronic Access Control Systems

A proximity reader with standard mechanical overdrive.

Electronic access control (EAC) systems are highly effective. Yet, business, industrial and government facilities invest thousands of dollars in these high-tech systems only to back them up with a generic mechanical cylindrical door lock. This low- to no-security lock can be easily drilled, picked or bumped, allowing access to unauthorized individuals and possibly criminals.

A mechanical lock is usually incorporated into an EAC system to provide access to the door during instances when the electronics become inoperable or during an emergency situation. This can occur when there is a power outage, battery failure, a fire or even network failure. The mechanical lock is operated by a mechanical key that retracts the latch to allow access. This operation bypasses the electronic portion of the access control device and gives full, unrestricted access to the user.

Upholding the integrity of the EAC system requires a strong backup mechanical key system that is patent protected and high security rated by reputable third parties, including UL and ANSI.

Control and Accountability

When it comes to the security and life safety of your customers' facilities, EAC systems offer several advantages. However, two advantages are quickly forfeited if the mechanical override cylinder is not designed to prevent unauthorized access.

Modern-day access control systems give control to the administrator. They enable administrators to change access privileges quickly and easily via a web-based mobile platform. At any time, administrators can add, remove or modify access rights for individuals, or groups of individuals, defining which spaces they can and cannot access and when. However, if the override cylinder can be easily defeated, control vanishes.

With EAC systems, administrators define spaces and openings included in those spaces. The system creates accountability by capturing the date and time of all activity, including whether access to a space was granted or denied. Users can easily export this detailed report to address security issues or errant behavior. However, if unauthorized users can gain entry via the mechanical override cylinder, the audit trail could disappear.
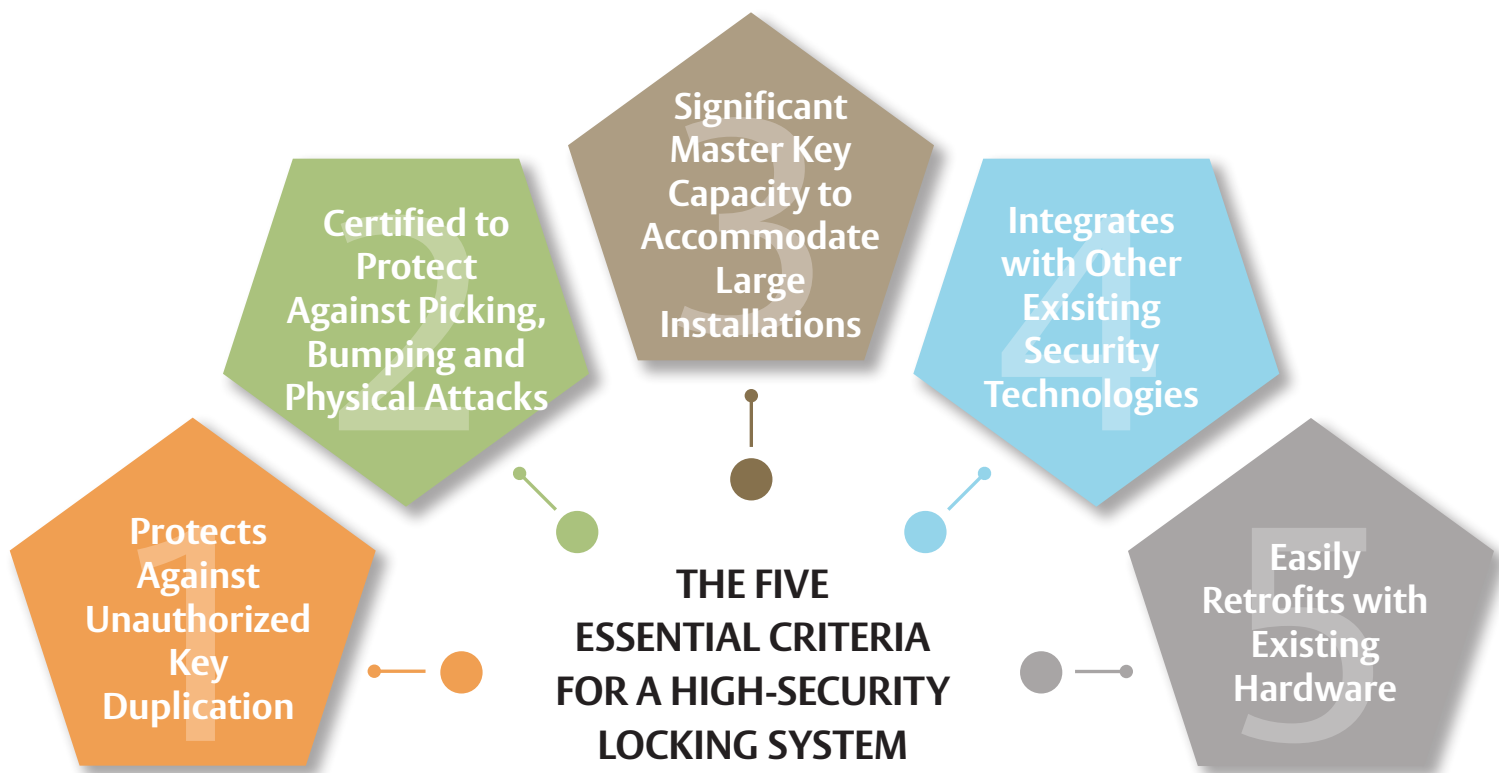
In the end, integrating high-security override cylinders into EAC systems upholds the control, accountability and peace of mind that an EAC system promises.

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Five Essential Criteria for a High-Security Locking System

Today's high-security locking systems are much more robust than those of even just a few years ago. When installing or upgrading mechanical locks, there are five essential criteria the system must satisfy in order to be deemed high security.

Significant Master Key Capacity to Accommodate Large Installations

Certified to Protect Against Picking, Bumping and Physical Attacks

Integrates with Other Exisiting Security Technologies

Protects Against Unauthorized Key Duplication

Easily Retrofits with Existing Hardware

THE FIVE ESSENTIAL CRITERIA FOR A HIGH-SECURITY LOCKING SYSTEM

It protects against unauthorized key duplication.

A locking system without a strictly controlled procedure for key duplication, quickly becomes vulnerable to unauthorized access. Therefore, the first step in protecting your property and valuables is to select a utility patented key system.

With a utility patent in place, a key control agreement is issued by the key manufacturer and signed by the locksmith and the end user. Only this particular locksmith is authorized to duplicate keys; it is illegal for another party to produce a key that will work in the patented lock. This agreement protects all parties involved and enables legal recourse if the agreement is violated.

Of course, the law is only an effective deterrent if the individuals involved respect the law. Today's most effective high-security locks, in addition to protecting against standard attacks such as picking and drilling, also incorporate moving or magnetic components in the key and cylinder that protect against more advanced attacks such as 3D-printed keys.

2 It is certified to protect against picking, bumping and physical attacks.

The best performing high-security locking systems usually include multiple pins in a variety of locations and configurations in the cylinder and each plays different roles in protecting against unauthorized entry. Most include a unique combination of side pins, finger pins, lift pins and other moveable components.

Underwriters Laboratories employs UL437 as the standard to assess the ability of door locks and cylinders to withstand picking, impressioning (using a blank key to take impressions of the pins in the lock) and forced entry, such as drilling, prying, pulling, punching and sawing. Effective high-security locking systems will carry this rating, as well as ANSI/BHMA A156.30 for high security cylinders (physical attack and key control), and ANSI/BHMA 156.5 used to establish minimum acceptable criteria for the number of cycles for cylinders and keys. The most robust high-security locking systems are designed to withstand more than one million cycles.

3 It provides significant master key capacity to accommodate large installations.

The standard master key system is designed with just five pins that allow only a few thousand possibilities of keying combinations. High-security key systems contain additional pins and other mechanisms in the cylinder that facilitate hundreds of key combinations. This enables the key system to include change keys, master keys, grand master keys, great grand master keys and any additional customized keying scenarios to enable it to grow along with the organization.

4 It integrates with other existing security technologies.

Even with a very effective high-security key system, one size certainly does not fit all. Larger organizations require multiple levels of security, depending on the door location and what it is intended to secure. For example, an organization's human resources area likely requires a more robust level of security than does its marketing department. Conference rooms containing expensive audio-visual equipment call for higher security than does a janitorial closet.

The most effective high-security key systems will integrate with other existing mechanical key systems, intelligent key systems and high-tech access control systems. This allows users to define the level of security needed for each opening and thereby control costs by installing more sophisticated high-security solutions only where needed. Because the high-security key system integrates with existing locking systems, users continue to enjoy the convenience of carrying only one key.

5 It retrofits easily with existing hardware to avoid additional expense when upgrading.

Consider a new building with 250 door openings. Oftentimes, building or project managers will choose to install a standard security system only to find that, a few years later, the occupant actually requires a high-security key locking system. Is it then necessary to change out all of the existing door hardware to accommodate the new system? The answer is a resounding no. The most effective high-security system is designed with high-security cylinders that easily retrofit with existing door hardware.

High-security commercial deadbolt locks are a proven, important complement to electronic technologies to provide truly resilient security solutions.

Introducing Medeco 4 High-Security Locks

When the first Medeco cylinder rolled off the production line in 1968, no one imagined the effect it would have on the security industry. The concept of angled cuts, angled pins, hardened steel inserts and a sidebar mechanism — all protected by an advanced utility patent, finally gave security professionals the ability to offer customers a foolproof solution for their security challenges.

Since then, multiple product advancements have made Medeco one of the most trusted names in high-security locking systems. In 1986, Medeco released its Biaxial® locking system, which touted additional fore and aft angles and offset chisel point pins to increase pick resistance. This solution made it possible for Medeco to offer extremely large, customized master key systems.

Along with the Biaxial technology came advanced dealer programs. For locksmiths and other security professionals, these programs created the opportunity to capture recurring revenue through restricted and exclusive key cutting agreements — enabling dealers to grow their business to a new level.

For end users, Biaxial technology brought greater physical protection and control over key duplication as well as custom-designed master key systems that supported facilities and operations of all sizes.

Later, in 2003, the company introduced its M3 locking system, which not only incorporated the Biaxial system's fore and aft cuts in the key, but also included a patented third locking component — a sliding mechanism. This, yet again, increased the physical protection in the cylinder and key and offered users millions of locking combinations to protect large and growing institutional and commercial spaces.

Medeco 4 features a patent-pending design, in effect through the year 2040, that pushes the boundaries of what a high-security key system can be.

New Patent-Pending Design Expands the Boundaries of High-Security Key Systems

Over the past five decades, Medeco has worked closely with security professionals around the globe to continue to enhance the design of its high-security locking systems. This collaboration has led to yet another revolution in high-security patented design, Medeco 4 or M4.

Medeco 4 features a patent-pending design, in effect through the year 2040, that pushes the boundaries of what a high-security key system can be.

While Medeco 4 is a leap in innovation when it comes to high-security design, it still leverages proven Medeco ingenuity, such as elevating and rotating off-set chisel point pins, top and master pins and springs, a sidebar mechanism to create a secondary shearline, as well as four hardened-steel rod and steel crescents. Select top pins are fashioned from hardened steel — and a hardened steel ball bearing protects the sidebar against drill attacks.

Medeco 4 High Security Locking Systems provide patented key control and protection against the latest threats.

M4 Design Pushes Innovation Boundaries

In addition to traditional Medeco pins that lift and rotate, M4's design includes four side pins: three finger pins and one lift pin, to protect against picking. The lift pin works in conjunction with the patent pending M4 key which contains a movable element that helps guard against the use of 3D printed keys. The key also contains factory-cut side bittings in four positions that engage the finger and lift pins, to create a third locking point in the cylinder. Keys are fashioned from the strongest nickel silver alloy and carry a lifetime warranty against breakage.

M4 cylinders are constructed of solid machined brass and are available in a wide variety of formats making retrofit projects straightforward and hassle free. They are UL 437 listed, as well as ANSI/BHMA A156.30 and A156.5 certified for quality and performance, and also exceed ANSI/BHMA Grade 1 cycle requirements by hundreds of thousands of cycles.

The M4 locking system was designed and engineered according to four principles:

INNOVATION
- Double-locking components and four side pins protect against advanced picking attacks and surreptitious entry
- Movable element in the key helps protect against use of 3D printed keys
- Multiple digital tools facilitate the design and management of the locking system

PROTECTION
- Patent protected until 2040, including international patents, to safeguard against unauthorized distribution and duplication of keys
- Key control agreements and digital authorization records help uphold the integrity of the system

COMBINATIONS
- Advanced 10-pin configuration provides enhanced master key capacity and millions of possible locking combinations
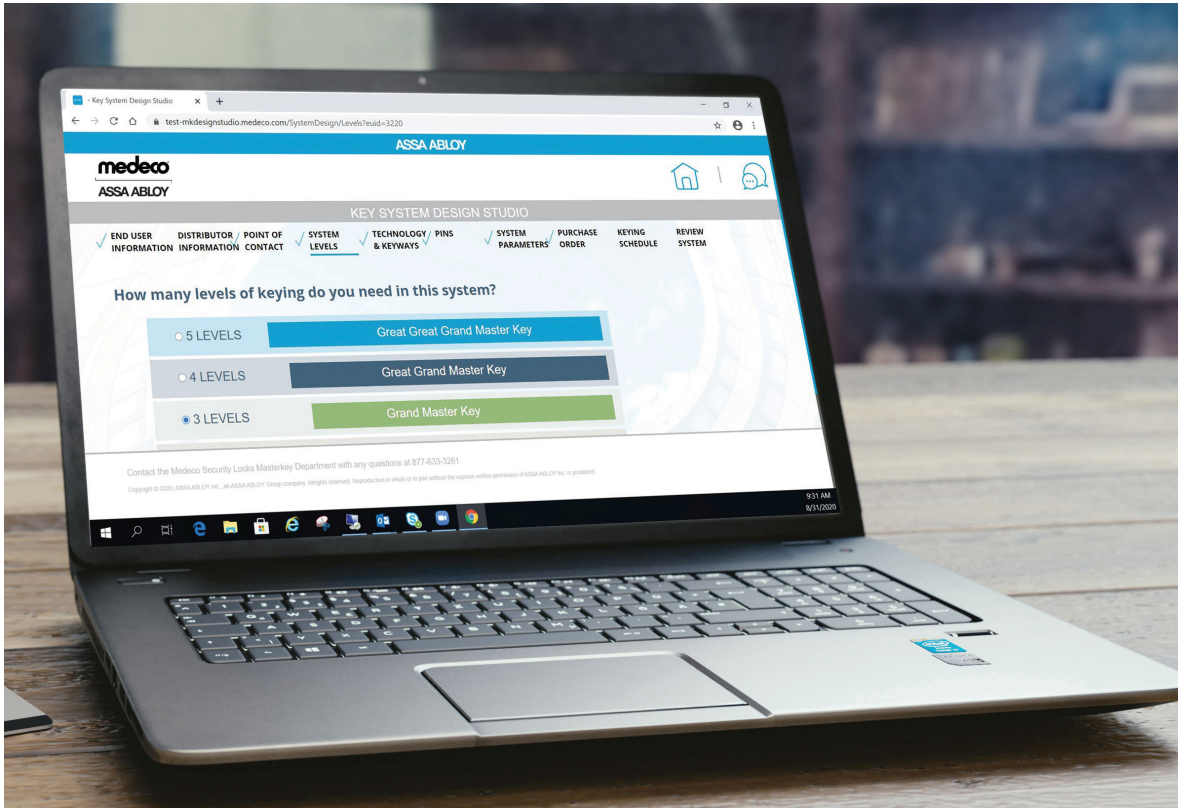
SECURITY
- UL437 and ANSI/BHMA A156.30 certifications provide third-party confirmation of high-security standards
- Strategically engineered hardened steel inserts protect against drilling and other physical attacks

Medeco 4 is more than just a high-security cylinder and key system. Medeco's philosophy centers on the belief that high-security should be an experience for users — an experience delivered via robust digital tools.
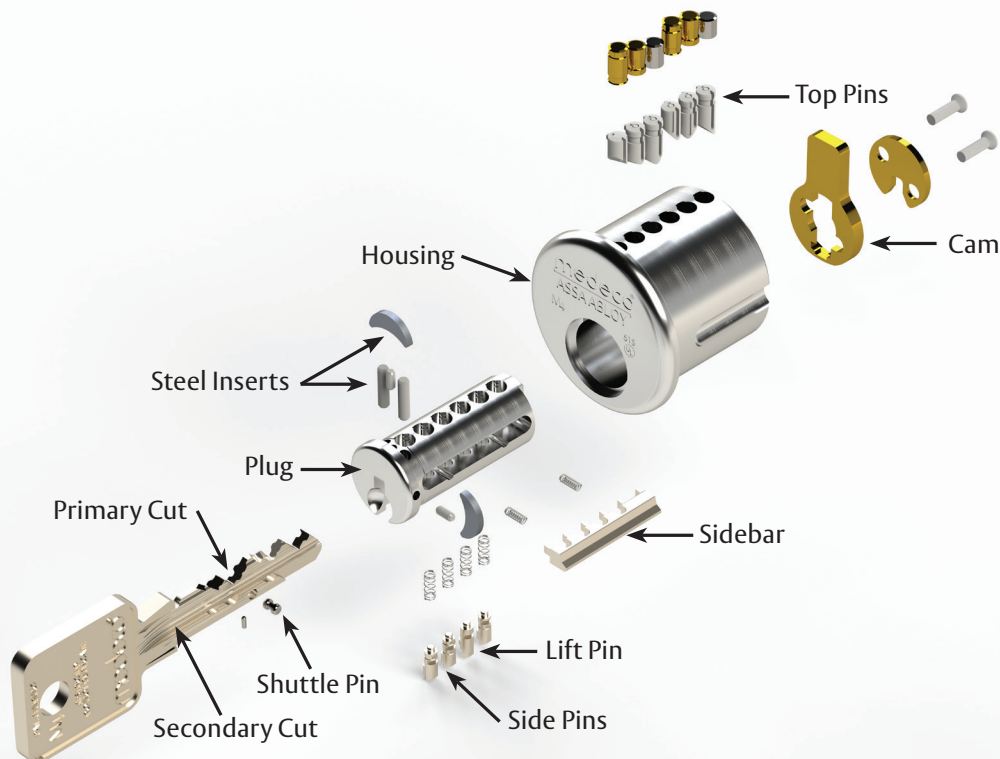
Digital Tools and Solutions to Enrich the User Experience — the Medeco 4 Ecosystem

Today, most physical products are enhanced by some type of digital capability. The M4 system is no different. M4 is not simply a high-security lock and key, it is supported by several digital tools that streamline tasks, automate processes and procedures and enrich the entire high-security experience.

Digital tools like online system creation offer secure convenience, previously unknown to high security key systems.

Key System Design Studio (KSDS)
This digital portal enables security professionals and end users to interactively design their own master key system online. Similar to smart tax preparation software, KSDS prompts the user to answer a series of critical questions regarding the security of their facility and spaces and outputs a master key specification that can then be furnished to a locksmith or the factory. The system is so easy to use, even a novice can design a robust master key system that will withstand the test of time.

Record of Authorization Online Portal
To ensure key blanks are kept out of the hands of unauthorized individuals, blanks should ship directly from the manufacturer to the end user, and only to authorized individuals in the organization. Therefore, orders for key blanks must be accompanied by a Letter of Authorization, either issued in writing or through a web-based tool like Medeco's Record of Authorization digital portal. The system quickly verifies and authenticates the identity of the authorized end user.

SimpleK Master Key System and Key Management Software
Even with the most advanced high-security locking system in place, key management is crucial to the success of the entire system. With tens or hundreds of key holders, how do you monitor who has what keys, what doors they have access to, when they received them, and which keys operate which locks? SimpleK software provides total key control with audit trails, outstanding keys, overdue keys, tools for the rekeying process, and more. SimpleK software allows you to import maps and floor plans to see who has access to each individual door, the associated keys, and hardware on the opening. SimpleK allows you to manage keys and keying systems of all sizes and types.

An investment in a high security key system is only as good as the security of the keys. IKC allows access to keys by authorized users only.

Intelligent Key Cabinet (IKC)

IKC is Medeco's electronically controlled steel cabinet used to store of all types of keys. It restricts access only to authorized personnel by way of a required PIN, biometric fingerprint or prox card authentication. It maintains an electronic record of all key removals and returns, including when the activity occurred and by whom and generates a comprehensive audit trail. For even greater ease of use, IKC is able to automatically generate custom reports and send them to users by email or SMS text.

Professional Services Support

M4 high-security locks are backed by some of the industry's most experienced professionals. They can assist with planning, scoping and implementing locking solutions that meet your organization's compliance, security and risk management needs. Perhaps you need help designing a master key system, developing a key control policy or conducting a site survey. Our professional services team can help, including providing post-installation training and technical support, either on site or via remote means.

Choose the Right Solution.

If your security needs call for a high security locking system that not only guards against picking, bumping and physical attacks, but also discourages unauthorized key duplication, be sure to choose one that is protected under a utility patent and managed under a key control agreement.

Medeco will continue to push the boundaries on advanced high-security locking systems. If you would like to learn more about how M4 products can serve your facility's key control and high-security challenges, visit medeco.com or call 877-633-3261.

The ASSA ABLOY Group is the global leader in access solutions. Every day, we help billions of people experience a more open world.

ASSA ABLOY Opening Solutions leads the development within door openings and products for access solutions in homes, businesses and institutions. Our offering includes doors, frames, door and window hardware, locks, perimeter fencing, access control and service.

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Founded in 1968 and based in Salem, Va., Medeco is a market leader in mechanical and electronic locks and locking systems for security, safety and control. The company's customer base includes wholesale and retail security providers; original equipment manufacturers; and institutional, commercial, industrial and residential end users.

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