COMPENDIUM

Of

INDIAN STANDARDS

On

SECURITY EQUIPMENT

(Part A – BANKING SECURITY)

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1. INTRODUCTION

The MED-24 Sectional Committee functions under the Mechanical Engineering Department of the Bureau of Indian Standards and is responsible for the formulation, revision, reaffirmation, and harmonization of Indian Standards related to banking security systems, physical protection infrastructure, and associated electromechanical systems.

Banking institutions, financial organizations, and high-security establishments require robust systems to ensure the protection of cash, valuables, confidential assets, and sensitive infrastructure. These systems include safes, vaults, strong room doors, locker cabinets, and integrated electronic security mechanisms.

The standards developed under MED-24 aim to ensure that such systems are secure, reliable, tamper-resistant, and capable of withstanding physical, mechanical, and environmental threats. These standards also support integration with modern technologies such as electronic locking, remote monitoring, and sensor-based security systems.

The scope of MED-24 (Part A) covers:

a) Safes and cash storage units
b) Strong room doors and vault systems
c) Safe deposit locker cabinets
d) Ventilation systems for secure enclosures
e) Electrical and electromechanical security systems
f) Electronic lockers and remote sensing systems

These systems are widely used in banks, financial institutions, government facilities, commercial establishments, and high-security zones. Improper design or substandard systems may lead to theft, unauthorized access, or failure under attack conditions. Therefore, standardization plays a critical role in ensuring uniform quality, safety, and performance.

2. TYPES OF BANKING SECURITY SYSTEMS

Security systems standardized under MED-24 (Part A) can be broadly classified based on their application and functionality.

2.1 Safes

Safes are secure storage units designed to protect cash, documents, and valuables against theft, fire, and unauthorized access. These are commonly used in banks, offices, and commercial establishments.

Safes may include:

a) Fire-resistant safes
b) Burglary-resistant safes
c) Composite safes with multi-layer protection

Key features include reinforced construction, secure locking mechanisms, and resistance to forced entry.

2.2 Strong Room Doors and Vault Systems

Strong room doors and vaults are high-security enclosures used in banks for storing large amounts of cash and valuables.

These systems include:

a) Reinforced steel or composite structures
b) Multi-bolt locking mechanisms
c) Time-delay locks and access control systems

They are designed to resist drilling, cutting, explosives, and other forms of attack.

2.3 Safe Deposit Locker Cabinets

Locker cabinets are used in banks to provide secure storage spaces for customers.

Key characteristics include:

a) Individual locker units with independent locking
b) Modular cabinet design
c) High resistance to tampering and forced entry

These systems must ensure privacy, security, and ease of operation.

2.4 Cash Boxes and Portable Security Units

Cash boxes are portable storage units used for handling cash in retail, banking operations, and cash transit systems.

These are designed to be:

a) Compact and robust
b) Tamper-resistant
c) Easy to handle and transport

2.5 Ventilation Equipment for Secure Enclosures

Ventilation systems are essential for strong rooms and vaults to maintain safe environmental conditions.

These systems ensure:

a) Adequate air circulation
b) Prevention of moisture accumulation
c) Maintenance of structural integrity

Ventilation systems must be designed without compromising security.

2.6 Electrical and Electromechanical Security Systems

Modern banking security systems incorporate electrical and electromechanical components such as:

a) Electronic locking systems
b) Access control systems
c) Alarm systems
d) Sensor-based intrusion detection

These systems enhance security through automation and monitoring.

2.7 Electronic Lockers and Remote Monitoring Systems

Advanced security systems include:

a) Electronic locker systems with digital access
b) Remote sensing and monitoring systems
c) Integration with centralized security networks

These technologies improve operational efficiency and real-time surveillance.

3. IMPORTANT COMPONENTS OF SECURITY SYSTEMS

Security systems under MED-24 consist of several essential components that ensure strength, controlled access, and protection against unauthorized entry. These components are designed to work together to provide both physical resistance and operational reliability. Proper material selection, design, and integration of these components are critical to achieving the required level of security in banking and high-value storage systems.

3.1 Structural Body

The structural body forms the main enclosure of safes, vaults, and locker systems and acts as the primary barrier against physical attacks. It is generally made from high-strength steel or composite materials to resist drilling, cutting, and impact. In many designs, multiple layers are used to improve resistance to both mechanical and thermal attacks. Proper fabrication and reinforcement ensure that the structure remains strong and free from weak points, thereby maintaining the overall integrity of the system.

3.2 Locking Mechanisms

Locking mechanisms control access to the secured system and are one of the most critical components. These may be mechanical, electronic, or biometric. Mechanical locks use keys or combinations, while electronic locks use PINs or smart cards. Biometric systems provide higher security through fingerprint or facial recognition. Modern locking systems may also include features such as time delays and access records. These mechanisms must be reliable, tamper-resistant, and capable of consistent performance.

3.3 Bolt Work System

The bolt work system secures the door by engaging strong metal bolts into the frame when locked. These bolts are usually made of hardened steel and are designed to resist forced entry. Advanced systems use multi-directional bolts to enhance security. Proper coordination between the lock and bolt system ensures smooth operation and effective locking.

3.4 Hinges and Reinforcement Elements

Hinges support the movement and weight of doors, especially in heavy systems like vaults. Reinforcement elements such as steel plates and internal supports strengthen the structure and prevent deformation. These components also help resist tampering and forced entry, contributing to the durability and stability of the system.

3.5 Electronic Control Systems

Electronic control systems manage the functioning of electronic locks, sensors, and alarms. They include control panels and circuits that enable automation and monitoring. These systems allow features such as remote access, alarm triggering, and activity tracking. Their reliability is essential for maintaining effective security.

3.6 Monitoring and Sensing Devices

Monitoring and sensing devices detect unauthorized access or abnormal conditions. These include motion sensors, vibration detectors, and intrusion sensors. When triggered, they activate alarms or alerts for immediate response. These devices add an active layer of security, complementing the physical protection of the system.

4. WORKING PRINCIPLE OF SECURITY SYSTEMS

Banking security systems operate on the fundamental principle of controlled access combined with strong resistance to unauthorized intrusion, ensuring that valuables and sensitive assets remain protected at all times. These systems are designed in such a way that only authorized personnel can gain access, while any attempt at unauthorized entry is either prevented or immediately detected.

The working of these systems begins with the secure enclosure of cash, documents, and valuables within reinforced structures such as safes, vaults, or locker cabinets. These structures are engineered using high-strength materials to withstand physical attacks such as drilling, cutting, or forced entry. Access to these enclosures is regulated through advanced locking mechanisms, which may include mechanical locks, electronic keypads, or biometric systems, depending on the level of security required.

In addition to physical protection, modern security systems incorporate electronic monitoring components such as sensors, alarms, and control systems. These devices continuously monitor the system for any abnormal activity, including unauthorized access attempts,

vibrations, or tampering. Upon detection of such events, the system automatically triggers alarms or alerts, enabling immediate response from security personnel or centralized monitoring systems.

The overall effectiveness of banking security systems lies in the integration of robust mechanical design with intelligent electronic monitoring. This combination ensures not only prevention of unauthorized access but also timely detection and response to potential threats, thereby providing comprehensive and reliable protection.

5. MANUFACTURING PROCESS OF SECURITY SYSTEMS

The manufacturing of banking security systems involves a combination of precision engineering, careful materiiial selection, and strict quality control to ensure high levels of strength, durability, and reliability. Since these systems are designed to protect valuable assets, the manufacturing process must ensure that every component meets specified security and performance standards.

The process begins with the fabrication of the structural body using high-strength steel sheets or composite materials. These materials are selected based on their ability to resist physical attacks such as cutting, drilling, and impact. The sheets are processed through operations such as cutting, bending, forming, and welding to create the main enclosure. Special attention is given to joints and welds to eliminate weak points and ensure uniform strength throughout the structure.

Locking mechanisms and bolt work systems are manufactured separately using precision machining processes. These components require high accuracy to ensure smooth operation and effective locking. Hardened materials are often used to improve resistance against tampering and wear. In advanced systems, electronic locking components are also produced and calibrated to meet functional requirements.

During the assembly stage, all components including the structural body, locks, bolt systems, hinges, and reinforcement elements are carefully fitted and aligned. Electronic components such as sensors, alarm systems, and control units are integrated at this stage to enable monitoring and automation features. Proper integration is essential to ensure seamless operation of both mechanical and electronic parts.

Surface finishing processes such as painting, powder coating, or anti-corrosion treatment are then applied to enhance durability and protect the system from environmental effects such as moisture and corrosion. These finishes also improve the aesthetic appearance of the product.

Finally, each unit undergoes thorough inspection and testing to verify its compliance with relevant standards. This includes checks for structural integrity, locking performance, and functionality of electronic systems. Only after meeting all quality and safety requirements is the product approved for use, ensuring reliable performance in real-world conditions.

6. TESTING AND SAFETY EVALUATION

Testing is a critical aspect in ensuring that banking security systems meet the required standards of strength, durability, reliability, and safety. Since these systems are used for protecting high-value assets, they must perform effectively under both normal operating conditions and potential attack scenarios. The testing procedures are designed to evaluate the structural integrity, resistance to unauthorized access, functional reliability of components, and performance under environmental conditions. These tests ensure that the systems comply with specified standards and are capable of providing long-term, dependable security.

6.1 Mechanical Strength Test

The mechanical strength test is conducted to evaluate the ability of the security system to withstand physical forces such as impact, pressure, and attempted forced entry. During this test, the structure is subjected to loads and mechanical stresses that simulate real-life conditions, including attempts to break or deform the system.

The objective is to ensure that the structural body, doors, hinges, and reinforcements do not fail or undergo excessive deformation under stress. This test verifies that the system maintains its integrity and continues to provide protection even when subjected to harsh mechanical conditions.

6.2 Burglary Resistance Test

The burglary resistance test assesses the system's capability to resist unauthorized entry attempts using various tools and techniques. In this test, simulated attack conditions are created using tools such as drills, cutting equipment, hammers, and prying devices.

The time required to breach the system and the level of resistance offered are carefully evaluated. The system must demonstrate sufficient resistance to delay or prevent intrusion attempts. This test is crucial in determining the security grade of safes, vaults, and locker systems.

6.3 Lock Performance Test

The lock performance test is carried out to verify the reliability, accuracy, and durability of locking mechanisms. The locks are subjected to repeated operation cycles to simulate long-term usage.

Parameters such as smooth functioning, resistance to tampering, and consistency in locking and unlocking are evaluated. For electronic and biometric locks, additional checks are performed for response time, accuracy, and failure handling. This test ensures that the locking system remains dependable over extended periods of use.

6.4 Endurance Test

The endurance test evaluates the long-term performance and durability of the entire security system. In this test, the system is subjected to repeated usage cycles, including opening and closing operations, locking and unlocking, and mechanical movements.

The purpose is to identify any wear, fatigue, or degradation in performance over time. The system must continue to function effectively without failure or significant reduction in performance. This test ensures that the product can withstand continuous use in real-world conditions.

6.5 Environmental Test

The environmental test is conducted to assess the performance of the system under varying environmental conditions such as temperature, humidity, and exposure to corrosive elements. These conditions simulate real-life scenarios where the system may be installed in different climates or environments.

The test ensures that materials, coatings, and components do not degrade, corrode, or malfunction due to environmental factors. Proper performance under such conditions is essential for maintaining long-term reliability and safety.

6.6 Electronic System Performance Test

This test evaluates the functionality, accuracy, and reliability of electronic components such as electronic locks, sensors, alarm systems, and control units. The systems are tested for proper response to inputs, signal accuracy, and overall operational stability.

In addition, the integration between electronic components and mechanical systems is also verified. The system must respond correctly to unauthorized access attempts and trigger alarms or alerts as intended. This test ensures that electronic security features function effectively and enhance the overall protection provided by the system.

7. APPLICATIONS

Security systems standardized under MED-24 (Part A) are widely used across various sectors where protection of valuables, sensitive information, and critical assets is essential. These systems form the backbone of physical security infrastructure and are designed to ensure safety, prevent unauthorized access, and maintain operational integrity in high-risk environments.

In banking and financial institutions, these security systems are extensively used for safeguarding cash reserves, confidential documents, and customer valuables. Safes, vaults, strong room doors, and locker cabinets are integral components of bank branches, currency chests, and treasury operations. These systems ensure secure storage and controlled access, thereby maintaining trust and reliability in financial operations.

In government facilities and public sector organizations, security systems are deployed to protect important records, classified documents, and valuable assets. High-security storage units and vault systems are commonly used in offices dealing with sensitive information, ensuring that access is restricted to authorized personnel only.

Commercial establishments such as jewellery shops, retail outlets, and corporate offices also rely heavily on these systems for protecting cash, inventory, and valuable goods. In such

environments, safes and electronic security systems help prevent theft and ensure business continuity.

Additionally, these systems are used in high-security storage areas such as warehouses, data centers, and research facilities, where protection against both theft and environmental risks is necessary. The integration of electronic monitoring and alarm systems further enhances security by enabling real-time surveillance and quick response to potential threats.

Overall, the application of these standardized security systems ensures a high level of safety, reliability, and confidence across multiple sectors, making them essential for modern security infrastructure.

8. KEY STANDARDS UNDER MED-24 (PART A)

The MED-24 Sectional Committee has developed several Indian Standards covering safes, strong room systems, locker cabinets, and electronic security systems. These standards define requirements related to design, construction, performance, and testing to ensure adequate security and reliability in banking applications.

8.1 IS 14203 - Burglary Resistant Safes - Specification

Scope:

This standard specifies the requirements for burglary-resistant safes intended for the secure storage of cash, valuables, and important documents in banks, commercial establishments, and other high-security areas.

Description:

This standard covers constructional features, material specifications, and performance requirements of safes designed to resist burglary attempts. It includes provisions for resistance against mechanical attacks such as drilling, cutting, and prying. The standard also specifies testing methods to evaluate the level of protection offered by the safe, ensuring classification based on security grades. It ensures that safes provide reliable and consistent protection under attempted intrusion conditions.

8.2 IS 550 (Part 1) - Safes - Part 1: General Requirements

Scope:

This standard lays down the general requirements for safes used for storage of valuables in residential, commercial, and banking applications.

Description:

The standard specifies requirements related to design, construction, materials, workmanship, and finish of safes. It ensures that safes are structurally sound and capable of providing basic protection against unauthorized access. It also includes provisions for locking arrangements and general performance requirements, ensuring uniformity and quality in manufacturing.

8.3 IS 17566 - Strong Room Doors, Ventilators and Frame - Specification

Scope:

This standard specifies the requirements for strong room doors, ventilators, and frames used in banks and other high-security installations.

Description:

The standard covers materials, constructional features, and performance requirements necessary to ensure resistance against burglary and forced entry. It includes provisions for robust door construction and secure frame integration. Additionally, it addresses ventilation arrangements that maintain airflow without compromising the security of the enclosure. The standard ensures that strong room systems provide high levels of protection along with functional efficiency.

8.4 IS 5244 - Safe Deposit Locker Cabinets - Specification

Scope:

This standard specifies the requirements for safe deposit locker cabinets installed in banks for secure storage of customer valuables.

Description:

The standard covers the design, construction, materials, and locking systems of locker cabinets. It ensures that individual lockers provide adequate protection against tampering and unauthorized access. The standard also includes requirements for durability, smooth operation, and reliability of locking mechanisms, ensuring efficient and secure usage in banking environments.

8.5 IS 11188 (Part 1) - Strong Room Doors - Methods of Test

Scope:

This standard specifies the methods of test for evaluating the performance and resistance of strong room doors used in banking and high-security applications.

Description:

It includes test procedures to assess resistance to various forms of attack such as mechanical force, drilling, and cutting. The standard also evaluates durability and functional performance under simulated conditions. These tests ensure that strong room doors meet the required safety and performance criteria and comply with specified security levels.

8.6 IS 19461 - Electronic Locking Systems for Safes and Strong Rooms - Specification

Scope:

This standard specifies the requirements for electronic locking systems used in safes, vaults, and strong room doors.

Description:

The standard covers design, performance, and security requirements of electronic locking systems. It includes provisions for features such as access control, authentication methods, and audit trails. The standard also specifies testing requirements to ensure reliability, resistance to tampering, and consistent performance. It supports the integration of advanced electronic security technologies in modern banking systems.

9. PUBLISHED STANDARDS UNDER MED-24 (PART A)

TABLE 1 - PRODUCT SPECIFICATION

Sl. No.	Standard Number	Title
1	IS 19461 : 2025	Electronic Locks for Security Equipment — Specifications
2	IS 15369 : 2025	Construction of Vault (Strong Room) — Code of Practice (Second Revision of IS 15369)
3	IS 14203 : 2023	Fire Resisting Record Protection Cabinets — Specification
4	IS 550 (Part 1) : 2022	Safes: Part 1 — Specification
5	IS 11188 (Part 1) : 2021	Vault (Strong Room) Doors Part 1 — Specification (Third Revision) Amendment No. 1
6	IS 17566 : 2021	Key Locks for Security Equipment — Specification
7	IS 14387 : 2021	Vaults Air Ventilators — Specification (Second Revision)
8	IS 17541 : 2021	Modular Panel for Security of Premises — Specification
9	IS 17532 : 2021	ATM Safes — Specification
10	IS 7152 : 2021	Book Room Doors — Specification (Second Revision)
11	IS 16723 : 2020	Combination Lock — Specification (First Revision)

12	IS 5244 : 2020	Safe Deposit Locker Cabinets — Specification (Fourth Revision) Amendment No. 3
13	IS 14561 : 2014	Fire Resisting (Insulating) Filing Cabinets — Specification (Second Revision)
14	IS 14562 : 2014	Fire Resisting Computer Media Protection Cabinets — Specification (First Revision)
15	IS 1046 : 2014	Cash Boxes — Specification (Fourth Revision)

TABLE 2 - METHODS OF TEST

Sl. No.	Standard Number	Title
1	IS 11188 (Part 3) : 2023	Vault Strong Room Doors Part 3 — Tests for Fire Resistance (Second Revision)
2	IS 550 (Part 2) : 2021	Safes — Part 2: Tests for Burglary Resistance (Sixth Revision)
3	IS 11188 (Part 2) : 2021	Vault (Strong Room) Doors — Part 2: Test for Burglary Resistance (Third Revision)
4	IS 550 (Part 3) : 2021	Safes — Part 3: Tests for Fire Resistance (Fourth Revision)

TABLE 3 - CODE OF PRACTICE

Sl. No.	Standard Number	Title
1	IS 15369 : 2017	Construction of Vault (Strong Room) — Code of Practice (First Revision)
2	IS 16524 : 2017	Physical Security System in Banks/Financial Institutions — Code of Practice