



Safes, ATM safes, strongroom walls and strongroom doors

Requirements, classification and test methods

For confidentiality reasons, the test methods are not shown.

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VdS-Guidelines for Physical Security Devices

Safes, ATM-safes, strongroom walls and strongroom doors

Requirements, classification and test methods

These product guidelines are binding only if their application has been agreed between VdS and the applicant on an individual basis. Otherwise, an application of these product guidelines is non-binding; an agreement on the application of these product guidelines is purely optional. In individual cases, third parties may also accept other safety precautions or installation or maintenance companies under conditions that are defined at their sole discretion and that do not comply with these technical specifications.

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1 Introduction

On base of these guidelines tests are performed the results of which lead to a classification of the resistance value of secure storage units against burglary. The classification also may be considered for the construction of security systems. For this purpose it is also to be considered that for real burglary attempts longer times can be anticipated as for testing depending on the skills of the burglar, the conditions on site and the availability of tools.

Results and reproduceability of tests which are performed manually depend on the experience of the test team. Automated tests are still in development, but may be considered when revising these guidelines.

1.1 Scope

On the base of these guidelines free-standing safes, built-in safes (floor and wall), ATM-safes and ATM base, strongroom doors as well as strongrooms (with or without door) are tested and classified according to their resistance against a burglary attack. These guidelines are not valid for testing and classification of deposit systems and automatic teller machines (ATM systems).

For other secure storage units and systems the following guidelines are valid:

- VdS 2528 Deposit Systems
- VdS 2530 ATM Systems¹⁾
- VdS 2531 Self-Service Deposit-Box Systems¹⁾
- VdS 2560 Safes with Special Functions²⁾

Note: The requirements for ATM-safes, VdS 2527 were taken over in these guidelines.

These guidelines are not valid for locks for secure storage units. These requirements and test methods are contained in the Guidelines for Physical Security Devices, High Security Locks for Secure Storage Units, Requirements and Test Methods, VdS 2396 resp. the European standard DIN EN 1300, Secure storage units – Classification for high security locks according to their resistance to unauthorized opening.

These guidelines are based on the European standard DIN EN 1143-1 : 2012-07 Secure storage units – Requirements, classification and methods of test for resistance to burglary – Part 1: Safes, ATM-safes, strongroom doors and strongrooms.

Secure storage units according to these guidelines may be pre-prepared at manufacturing already for the use in intruder alarm systems (IAS) or pre-equipped with system IAS components. In these cases the following guidelines are valid in addition:

- VdS 2264 IAS Surveillance Measures for Secure Storage Units¹⁾

1.2 Validity

These guidelines are valid from 01. November 2012. They supersede version VdS 2450 : 2011-04 (06).

Note: This is a translation of the German guidelines; if there are any discrepancies, the German version shall be binding.

2 Normative references

These guidelines contain dated and undated references to other standards. The reference is made in the respective clauses, titles are listed underneath. Changes or amendments of

¹⁾ in preparation

²⁾ at draft stage

undated standards are valid only, if they are published as change of these guidelines. For undated references the latest edition of the publication referred will be applied.

- DIN EN 1143-1** Secure Storage Units – Requirements, Classification and Test Methods for Resistance to Burglary – Part 1: Safes, ATM-safes, Strongroom Doors and Strongrooms
- DIN EN 1300** Secure storage units – Classification for high security locks according to their resistance to unauthorized opening
- VdS 2264** IAS Surveillance Measures for Secure Storage Units
- VdS 2396** High Security Locks for Safes & Strongrooms, Requirements and Test Methods
- VdS 2451** Strongrooms in Solid and/or Modular Construction
- VdS 2527** ATM-safes, Requirements, Classification and Test Methods (withdrawn)
- VdS 2528** Deposit Systems
- VdS 2530** ATM Systems²⁾
- VdS 2531** Self-Service Deposit-Box Systems¹⁾
- VdS 2560** Safes with Special Functions²⁾

3 Terms & definitions

For the purpose of these guidelines the following terms and definitions are valid:

ATM base: Any integral part of an ATM system located between the ATM safe and the surface to which the safe is to be anchored.

ATM-System: Assembly of sub-units which provides an ATM function and affords security to cash and/or valuables stored within the ATM safe.

Note 1: An example of an ATM-System is shown in figure 3-01.

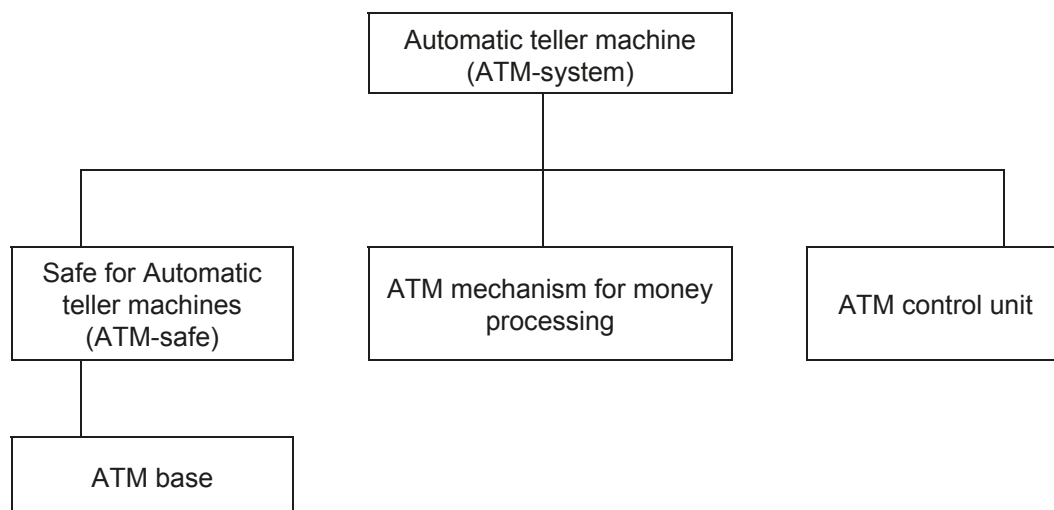


Figure 3-01: Example of an ATM-System

Note 2: Of the sub-units shown in figure 3-01, the ATM mechanism and the ATM control unit are not tested according to these guidelines.

¹⁾ In preparation

²⁾ at draft stage

Basic value (BV): Number in resistance units allocated to a particular tool.

Note: The basic value represents problems in obtaining, transporting, using and operating the relevant tool at the site in question and the necessary knowledge and experience for its efficient use.

Built-in safe: Safe whose protection against burglary is partly dependent upon materials incorporated into it, or attached to it, during installation.

Note: Under floor safes and wall safes are special types of built-in safes.

Intruder alarm system (IAS): System for the automatic surveillance of protected premises to prevent unauthorised entry.

EX-protection: Protection that secure storage units have against defined attacks with explosives.

Note: The test of EX-protection comprises at least one attack during which a partial access is achieved.

Explosion: Sudden oxidation or decay reaction with increasing of the temperature, the pressure or both at the same time.

Gas mixture capable of explosion: A mixture of ignitable gas and oxygen or air which causes an explosion when a fuse which is located in the gas mixture is released. A gas mixture capable of explosion exists if a gas concentration within the explosion area, i.e. between lower explosion border (low fuel) and upper explosion border is given (high fuel).

Free-standing safe: Safe whose protection against burglary depends only upon the materials and construction of its primary manufacture and not upon material added or attached during installation.

Gas-Protection: Protection that ATM safes have against defined attacks with gas explosives.

Note: The test of Gas-protection comprises at least one attack during which a partial access is achieved.

Automatic teller machine (ATM): Means for holding and processing cash and/or valuables.

Note 1: In the sense of these guidelines money machines, money exchange machines, money recycling machines as well as machines as e.g. in German "Beschäftigtenbedienter Banknotenautomat – BBA" (Staff-operated cash dispenser) are considered as ATM.

Note 2: Furthermore the following definition is applicable for these guidelines: Machine for automatic administration, processing, alignment and deposit for valuables. These valuables are sorted within the ATM of a safe. ATM may be used by employees of a bank as well as by customers for input and/or output of valuables.

Operating time: Time during which a tool is used attempting to create a change in the test specimen.

Note: In the context of these guidelines, there are also operating times considered during which no visible modification/changes are caused to the specimen.

Internal space: Part of the interior of an ATM safe which is bounded by the inside surfaces and the bolt work cover plate(s) of the door of the ATM safe body.

CD-Protection: Protection of a secure storage unit against a defined attack with diamond tools. The test of the CD-protection covers at least one attack with which a part opening at safes or a complete penetration at strongrooms and/or strongroom doors is reached.

Relocking device: System comprising blocking and detecting elements which will prevent the bolt work from being withdrawn if a burglary attack is detected.

Note: A relocking device can be part of the locking mechanism (e.g. active or live relocker) or an independent unit (e.g. passive relocker).

Test specimen: Testable unit, at which part tests or additional tests may be performed. In this regard the type testing is the entity of all necessary part and additional tests for the classification of secure storage units.

Bolt work: Mechanism by which a shut door is held such that until it is in the withdrawn position the door cannot be opened.

To close: To move the door, so it becomes possible to bolt it.

Lock: Device able to recognize a coded input and which performs a blocking function on the bolt work of the door.

To lock: To block a thrown bolt work by action of a lock.

Partial access: Opening by which a defined testing gauge may be inserted into the inside of the test specimen.

To bolt: To throw the bolt work or the bolt of the lock (if there is no bolt work) to a position where it fixes the door in closed position.

Latch: Entity of locks and bolt work.

Complete access (complete penetration): Opening by which a defined testing gauge may be inserted through the wall or the door to the inside of the specimen

As complete access also the following is counted:

- Removal of a built-in-safe out of the specimen
- Removal of the safe door
- Opening of the safe door up to an inner width of 300 mm to at least 80 % of the inner height.

Tool coefficient: Number in resistance units per minute allocated to a group of tools.

Note: The tool coefficient represents factors such as noise, smoke, fumes, and other effects, which increase the likelihood of a burglary attack being detected.

Secure storage unit: Strongrooms and safes which protect against burglary.

Stoichiometric gas mixture: Gas mixture which is suitable for the chemical stoichiometry, so that an entire chemical conversion of the source reagents can occur.

Fuse: The element which delivers necessary energy for the ignition of the gas mixture capable of explosion.

Strongroom: Storage unit which protects against burglary and when closed has internal side lengths in all directions > 1 m.

Note: Strongrooms may be cast in-situ, constructed from pre-fabricated elements or a combination of both.

Strongroom door: Door with lock(s), boltwork and frame intended for giving access to a strongroom.

Safe: Storage unit which protects its contents against burglary and when closed has at least one internal side \leq 1 m length.

ATM safe: Safe forming part of an ATM system.

Note: In the framework of these guidelines an additional definition is applicable: Safe, in which an ATM is mounted or around which an ATM is constructed. It is part of the ATM and disposes of pre-prepared openings, which are necessary for the function of the ATM.

Resistance unit (RU): Burglary resistance which results from one minute's use of a tool carrying the coefficient 1 and the basic value 0.

Resistance grade: Classification designation for burglary resistance.

Resistance value: Numerical value in resistance units calculated for each test.

Additional devices/accessories: Installations/devices which are in the structure or which pass through the structure of the strongroom or the strongroom door(s) for ventilation or for deposit of cash and valuables.

Note: Additional devices/accessories may be always open, usually open (but can be closed in case of emergency) or closed (but can be opened if necessary).

4 Classification and requirements

4.1 Classification

Safes are classified to resistance grades according to table 4-01.

ATM-safes are classified to resistance grades according to table 4-02.

Strongroom doors and strongrooms (with or without door) are classified to resistance grades according to table 4-03.

All products shall meet the general requirements (clause 4.2). Additional requirements (clause 4.3 and 4.4) are valid for products with the marking "EX", "GAS" and "CD".

4.2 General requirements

4.2.1 Safes, strongroom doors and strongrooms

There shall be no holes through the protection material other than those necessary for locks, cables or anchoring, or for the fitting of accessories to strongroom doors and strongrooms.

Cable openings in safes, strongroom doors and strongrooms (with or without a door) shall not exceed 100 mm². Unused cable entry openings shall be obstructed or plugged by the manufacturer by means which cannot be removed from the outside without leaving visible traces.

Free-standing safes with a mass of less than 1,000 kg shall have at least one hole by which they can be anchored. The anchoring assembly for each anchoring hole shall sustain the force given in table 4-01. The respective material for the fixing shall be annexed to the safe. The performance features of materials to be used alternatively are to be specified in the manufacturers' instructions.

Note 1: In strongrooms system-relevant openings for deposit systems (e.g. day/night deposit-safe-systems) are admitted only together in connection with an installed system (insertion equipment/device, drop-chute and receiving unit (container) up to a dimension of 200 cm², if they are contained in the construction sketches (see clause 5, point 3) g) and the requirements according to clause 7.4, 7.5.3.2 and 7.5.3.3 are fulfilled.

Note 2: The requirements and test methods for deposit systems (e.g. day/night deposit-safe-system) are contained in the Guidelines for Physical Security Devices, Deposit Systems, VdS 2528.

Note 3: Additional requirements and test methods for strongrooms are implemented in the guidelines of physical security "Strongrooms in solid, modular and composite construction" - VdS 2451en.

4.2.2 ATM-safes

ATM safes shall have means for plugging unused openings. These means shall be impossible to remove from the outside when leaving visible traces.

Note 1: Openings through the protection material for ATM functioning are permitted in ATM safes.

Note 2: Cable entry openings in ATM safes may be larger than 100 mm². ATM safes shall have a fixing capability by which they can be anchored and which shall sustain the required force given in table 4-02.

4.2.3 Bolt work cover plate

Safes, ATM safes and strongroom doors shall have an internal bolt work cover plate which prevents unauthorized viewing of the locks and bolt work, and access to them, when the door is open. Bolt work cover plates shall be secured so that they cannot be opened or removed by an unauthorized person without leaving visible traces.

Note: It is recommended to ensure, that the cover plate(s) of the bolt work-room cannot be removed by simple measures (e.g. screw drill). Suitable measures are e.g. additional lock or codes or inhibiting of the cover so that the cover can be removed only when the bolt work is in intermediate position.

4.2.4 Cable hole

Safes, strongroom doors and strongrooms of resistance grade III and higher shall either have a hole for a cable or a preparation enabling a connection to be made to an intruder alarm system (IAS) after the secure storage unit has been installed.

Note: The requirements for the surveillance of a secure storage unit by an intruder alarm system (IAS) are described in the guidelines VdS 2264.

4.2.5 User instructions

Safes, strongrooms and ATM safes shall be provided with operating and maintenance instructions, including instructions in respect of the locks. Free-standing safes and ATM safes shall have instructions for anchoring. For built-in safes, strongroom doors and strongrooms, installations instructions shall be provided.

Note: These instructions should contain the following information:

- *Constructional requirements for installation and operation (e.g. floor anchoring, floor loading, quality, dimensions and laying plan of possible reinforcements and enclosures, standard gauges for wall openings)*
- *Operation instructions (e.g. change of locks, interval of lock changings, intervals for greasing, changing and maintenance, laying plan, and parts list for IAS components if pre-prepared for IAS)*
- *Note, that after intrusion or intrusion attempt or fire as well as incorrect intervention in the construction and the function the validity of the approval of the safe expires.*
- *Manufacturers' recommendations for a secure operation (accident prevention), jeopardising items for incorrect operation (e.g. emission of toxic gas in fire or intrusion, indication of environmental imperilling constructional material and system of waste disposal)*
- *Addresses of customer service points*

4.3 Additional requirements for "EX" designation

When tested in accordance with clause 9, safes of resistance grades II to X "EX" designated shall achieve the minimum post-detonation resistance values given in table 4-01. "EX" designation is not applicable to safes of resistance grade N (0) to I.

When tested in accordance with clause 9, ATM safes of resistance grades II to VIII designated "EX" shall achieve the minimum post-detonation resistance values given in table 4-02. "EX" designation is not applicable to ATM safes of resistance grades L and I.

When tested in accordance with clause 9, strongroom doors and strongrooms (with or without doors) of resistance grades II to XIII designated "EX" shall achieve the minimum post-detonation resistance values given in table 4-03. "EX" designation is not applicable to strongroom doors and strongrooms of resistance grades N (0) and I.

When tested in accordance with clause 9, the cable-entry openings of safes, strongroom doors and strongrooms (with or without doors) which are designated "EX" shall not permit the entry of explosives (e.g. fuses or charges).

4.4 Additional requirements for “Gas” designation

When tested in accordance with clause 10, ATM safes of resistance grades II to VIII designated “Gas” shall achieve the minimum post-detonation resistance values given in table 4-02. “Gas” designation is not applicable to ATM safes of resistance grades L and I.

4.5 Additional requirements for “CD” designation

When tested in accordance with clause 11, safes of resistance grades IV to X designated “CD” shall achieve the minimum resistance values given in table 4-01. “CD” designation is not applicable to safes of resistance grades N (0) to III and ATM safes.

When tested in accordance with clause 11, strongroom doors and strongrooms (with or without door) of resistance grades VIII to XIII designated “CD” shall achieve the minimum resistance values given in table 4-03. “CD” designation is not applicable to strongroom doors and strong-rooms of resistance grades N (0) to VII.

Re-sistance grade	Attack test with tools (clause 7)		Anchoring strength ¹⁾ (clause 8)	Locks		Additional requirements for EX designation (optional) (clause 9)	Additional requirements for CD-designation (optional) (clause 11)			
	Resistance value for			Required force	Quantity			Class ²⁾	Post-detonation resistance value ⁶⁾	Resistance value
	Partial access	Complete access								
N (0) ³⁾	30	30	50	1	A	⁴⁾	⁵⁾			
I	30	50	50	1	A	⁴⁾	⁵⁾			
II	50	80	50	1	A	4	⁵⁾			
III	80	120	50	1	B	6	⁵⁾			
IV	120	180	100	2	B	9	1,000			
V	180	270	100	2	B	14	1,000			
VI	270	400	100	2	C	20	1,000			
VII	400	600	100	2	C	30	1,000			
VIII	550	825	100	2	C	41	1,000			
IX	700	1 050	100	2	C	53	1,000			
X	900	1 350	100	2	C	68	1,000			

¹⁾ Applicable only for free-standing safes with a mass less than 1,000 kg.

²⁾ According to VdS 2323, List of Locks for Safes & Strongrooms, whereas class 1, 2 and 3 correspond with VdS-class A, B and C.

³⁾ In VdS-Guidelines the classification of safes and strongrooms begins with grade N, in the European standard EN 1143-1 it is spoken of grade 0.

⁴⁾ “EX” designation is not possible for resistance grades N (0) and I.

⁵⁾ “CD” designation is not possible for resistance grades N (0) to III.

⁶⁾ Resistance value for partial access

Table 4-01: Minimum requirements for the classification of safes (exclusively ATM-safes) into resistance grades

Re-sistance grade	Attack tests with tools (clause 7) Resistance value for			Anchoring strength (clause 8.2)	Attack tests with tools on fixing attachment (clause 7)	Additional requirements for postan anchoring forcing test (Clause 8)	Locks		Additional requirements for marking "EX" and "GAS" (optional) (clause 9 and 10)	
	Partial access	Complete access	Required force				Resis-sis-tance value	Post-anchoring resis-sis-tance value		Quantity
	general	Used apertures ²⁾								
	RU	RU	RU	kN	RU	RU				RU
L	Body ³⁾	20	20	30	50	30	18	1	A	4) ⁴⁾
	Door	30	30	50						
I		30	30	50	50	30	18	1	A	4) ⁴⁾
II		50	35	80	50	50	22	1	A	4
III		80	65	120	50	50	22	1	B	6
I V		120	100	180	100	50	22	2	B	9
V		180	145	270	100	50	22	2	B	14
V I		270	220	400	100	70	22	2	C	20
V II		400	350	600	100	120	22	2	C	30
V III		550	500	825	100	160	22	2	C	41

¹⁾ According to VdS 2323, List of Locks for Safes & Strongrooms, whereas class 1, 2 and 3 correspond with VdS-class A, B and C.

²⁾ Applies only to apertures actually used; plugged and unused apertures shall satisfy the general values.

³⁾ Resistance values do not apply to the body of ATM-safes of resistance grade L, which fulfil the requirements according to clause 7.5.5.

⁴⁾ "EX" and "Gas" designation is not possible for resistance grades L and I.

⁵⁾ Resistance value for partial access

Table 4-02: Minimum requirements for the classification of ATM-safes in resistance grades

Re-sistance grade	Attack tests with tools (clause 7)	Locks ¹⁾		Additional requirements for "EX" designation (optional) (clause 9)	Additional requirements for "CD" designation (optional) (clause 11)
	Resistance value for complete access	Quantity	Class ²⁾	Post-detonation resistance value	Resistance value ³⁾
	RU			RU	RU
N (0)	30	1	A	- ⁴⁾	- ⁵⁾
I	50	1	A	- ⁴⁾	- ⁵⁾
II	80	1	A	4	- ⁵⁾
III	120	1	B	6	- ⁵⁾
IV	180	2	B	9	- ⁵⁾
V	270	2	B	14	- ⁵⁾
VI	400	2	C	20	- ⁵⁾
VII	600	2	C	30	- ⁵⁾
VIII	825	2	C	41	10 000
IX	1 050	2	C	53	10 000
X	1 350	2	C	68	10 000
XI	2 000	3	C or	100	10 000
		2	D		
XII	3 000	3	C or	150	10 000
		2	D		
XIII	4 500	2	D	225	10 000

1) Not applicable for the classification of strongrooms without door.

2) According to VdS 2323, List of Locks for Safes & Strongrooms, whereas class 1, 2, 3 and 4 correspond with VdS-class A, B, C and D.

3) Resistance value for complete access achieved by diamond core drilling.

4) "EX" designation is not possible for resistance grades N (0) and I.

5) "CD" designation is not possible for resistance grades N (0) to VII.

Table 4-03: Minimum requirements for the classification of strongroom doors and strongrooms into resistance grades

5 Technical documentation

The technical documentation shall contain the following information.

- 1) The date of issue and the name of the manufacturer or the name of the applicant requesting testing shall be on each page.
- 2) Statement of the type of product: free-standing safe, built-in safe (floor and wall), ATM safe, strongroom door or strongroom (with or without a door) together with a list of sizes covered by the same design, from which deviations on the position of doors are specified, which are covered by the construction.
- 3) Drawings of the test specimen showing the following:
 - a) weight, outside and inside dimensions, and the manufacturing tolerances
 - b) horizontal and vertical cross sections
 - c) quantity, layout and features of locks, bolt work and relocking devices
 - d) quantity, pitch and position of door bolts, their dimensions (e.g. cross section), throw and engagements and their type (e.g. moving or fixed)
 - e) location and design of any local areas of special protection materials
 - f) details of the fastening and/or fitting or anchoring of all elements relevant to physical security; e.g. construction and position of joints and connections, the means by which door and/or frames are joined to walls, the means by which prefabricated panels are joined
 - g) marking, position and dimensions of any holes which pass through the protection material with a detailed representation of specially protected areas
 - h) details of optional features, for example feature for time locking and time delay locking
 - i) for ATM-safes, the ATM base, if any, will be identified by the manufacturer.
- 4) List of all the locks which may be fitted, indicating the manufacturer and model and approval number.
- 5) Specification of the materials of construction if not contained on the drawings.
- 6) Statements of details of any materials or device(s) intended to generate gas, smoke, soot, etc. in the event of physical attack or which could generate harmful substances during testing.
- 7) Statements about form and position of cable ducts and/or other systems to detect penetration, mounting electromechanical security devices, alarm devices and so on.
NOTE: Requirements for monitoring safes by a burglar alarm system are implemented in our guidelines "IAS Surveillance Measures for Safes & Strongrooms" - VdS 2264en.
- 8) Installation instructions giving at least the following details:
 - a) method of anchoring free-standing safes with a mass less than 1,000 kg
 - b) method of encasing built-in safes, i.e. proportion of body which is to be encased; the minimum size and section thickness of the encasement; the minimum quality of encasement material (types and proportions of aggregates, cement and any other constituents, flowability of the freshly prepared mass and the 28-day cube compression strength together with the relevant methods of test to define these features); any reinforcement or anchoring to be included within the encasing mass
 - c) method for the construction of monolithic cast in-situ strongrooms, including the following: minimum quality of concrete (types and proportions of aggregates, cement and any other constituents, flowability of the freshly prepared mass, and the 28-day cube compression strength together with the relevant methods of test to define these features); reinforcement to be included in the strongroom, the means by which door and frame are joined to walls and the means by which armouring and anchoring are joined to elements

Note: Additional requirements and test methods for Strongrooms are implemented in our guidelines of physical security "Strongrooms in solid, modular and composite construction" - VdS 2451en.

- d) method for assembling pre-fabricated strongroom elements
- e) method by which the ATM safe, or combined ATM safe and ATM base, is anchored to the floor or other surface.

9) ATM-safes

For ATM-safes the following information are necessary in addition:

- Description of all openings with dimensions and indication on position in the secure storage unit
- Indication on use of the openings (e.g. cable bushing)
- Special protection measures for the openings
- Nomination of series with indication on types of models of a series

10) Bases for ATM-safes

Following information is necessary for basements of ATM safes:

- Description of type of basement
- Dimensions (w x h x d) of the basement
- Construction sketches – cross section and vertical section to the basement
- Specification of used materials
- Indication of connections and/or fastening of all elements
- Indication of the type and the dimensions (w x h x d) of the ATM or the safe for ATM, for which the basement is provided
- Mounting instructions resp. anchoring instructions of the safe resp. the ATM-safe
- Instructions on the connection of the safe resp. the ATM-safe with the basement
- Instructions on anchoring methods of the basement
- Description of series with indication on type of models of a series

6 Test specimen

The test specimen shall be a safe, an ATM safe, a strongroom door or a strongroom (with or without a door). The strongroom test specimen shall consist of elements representing all joints and assemblies essential for testing purposes.

Optional features (see clause 5, point 3 h)) which could decrease the burglary resistance value shall be included in the test specimen. Optional features (see clause 5, point 3 h)) and accessories such as time locking and time delay locking which could increase the resistance value in the tool attack test shall be removed or made not operative during the tool attack test.

An ATM safe test specimen shall include an ATM base if this is required for any type of installation. If the ATM base is optional, the testing laboratory can choose whether to test with or without the ATM base,

Cable entrances for detection systems and/or accessories specified in the technical documentation shall be present in the test specimen.

Test specimen for built-in safes and cast in-situ strongrooms shall be constructed using the components supplied and following the instructions for installation (see clause 5, point 8).

13 Marking

13.1 Safes, strongrooms and strongroom doors

Each product approved (certified) by VdS against these guidelines shall be labelled with the resp. metal VdS approval label according to figure 13-01 to figure 13-03 (either in German or English language).

The VdS approval label shall be fixed in such a way on the inner side of a door of a safe or a strongroom door or on the front side of the pre-prepared component of a cabinet such that it is not easy to remove it.

The VdS approval labels for VdS-approved secure storage units may be ordered from the VdS Certification body.

The VdS approval label contains the following information indicated by the VdS Certification body:

- Identification code
- Resistance grade, if given 'EX' and/or 'CD'
- VdS approval number

The following information are to be completed by the manufacturer of the safes & strongrooms for each product:

- Serial no
- Weight (kg)
- Year of manufacture



Figure 13-01: VdS approval label for safes



Figure 13-02: VdS approval label for strongrooms



Figure 13-03: VdS approval label for strongroom doors

13.2 ATM-safes

Any of the ATM-Safes which are VdS approved on base of these guidelines are to be marked with the respective metal VdS approval label according to figure 13-04.

The approval label shall be fixed on the inside of a door such that it cannot be removed easily.

The VdS approval label contains the following indications impressed by VdS certification body:

- Identification code
- Resistance grade, if given “EX” and/or “GAS” protection
- VdS approval number
- Model
- Version
- Design

The following information is to be completed by the manufacturer of the safes & strong-rooms for each product:

- Serial-No
- Weight (kg)
- Year of manufacture



Figure 13-04: VdS approval label for ATM-safes

13.3 ATM bases

Any of ATM bases approved by VdS on base of these guidelines is to be marked with the respective metal VdS approval label according to figure 13-05 (alternatively in German or English language).

If the fixing of the VdS approval label at a visible point of the base is not possible the VdS approval label shall be affixed on the inside of the door of the ATM which is mounted on this base.

The VdS approval label contains the following indications impressed by VdS Certification body:

- Identification code
- Resistance grade (of the base)
- VdS approval number of the ATM mounted on the base
- Model of dedicated ATM

Following indications are to be completed by the manufacturer of the ATM base for each product:

- Serial no
- Year of manufacture



Figure 13-05: VdS approval label for ATM bases

Additional marking of the Secure storage units by the manufacturer are admitted. These may contain following information as e.g.

- manufacturer's name or identification code
- standard designation and resistance grade
- type, model number, designation of size
- serial number

Annex A – Attack tools (normative)

In this annex tool coefficients and basic values, are given for each tool (see tables A-01 to A-14) and tool categories (A, B, C, D and S) which are allowed to be used in the tool attack test. In addition the intended use of the tool is described.

Note: In some cases the basic value also will vary within a tool category.

Tools of tables A-01 to A-06 are used manually only, without external power supply. Tools of tables A-07 to A-10 are used with external supply terminals and usually (with the exception of tool category A) depend on external sources of power. Tools of tables A-07, A-08 and A-10 can be used with cutting and/or cooling fluids.

Tools shall be used for the purpose for which they are designed. If a tool replaces another type of tool, the coefficient of the replaced or simulated tool (if higher) is applicable.

Example: If a screwdriver is used as a punch then it shall not be regarded as a hand assembling/disassembling tool but as a tool specific accessory with a basic value of 1 resistance unit (RU).

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
weight ≤ 1.5 kg and length ≤ 400 mm BV: 0	weight ≤ 3.0 kg and length ≤ 1,500 mm BV: 5	–	–	–
<p><i>Note: These tools are used for non-destructive assembling and disassembling of detachable elements, e.g. to detach screws, pins or bolts, spring clips.</i></p> <p>Examples: Screwdrivers, fork/ring wrenches</p> <p>Table A-01: Hand assembling/disassembling tools</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
weight ≤ 1.5 kg and length ≤ 400 mm BV: 0	length ≤ 1,500 mm BV: 7	–	–	–
<p><i>Note: These tools are used for the gripping (lever transmission) of tools and materials, e.g. fixing/holding of chisel.</i></p> <p>Examples: Universal pliers, wrenches, chisel holders, forge tongs</p> <p>Table A-02: Hand gripping tools</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
length \leq 750 mm BV: 5	length \leq 1,500 mm BV: 7	–	–	–

Note: These tools transmit physical force by a lever, e.g. prise-up a door, deform or fracture weak pieces.

Examples: Screwdriver, tyre levers, hand levers, crowbars

Table A-03: Hand levering tools

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
weight \leq 1.5 kg and length \leq 400 mm BV: 0	–	–	–	–

Note: These tools are used for manual grinding, cutting and detaching of various materials without additional electric means of propulsion, e.g. sawing steel sheets.

Examples: Hand drills, saws, files, side cutters, bolt croppers, plate shears, steel cutters

Table A-04: Hand sawing/filing/cutting and drilling tools

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
Head weight \leq 1.5 kg and moment \leq 10 Nm and length \leq 750 mm BV: 5	Head weight \leq 3.0 kg and moment \leq 25 Nm and length \leq 1,000 mm BV: 7	–	–	–

Note: These tools are used to break up various materials and to propel different accessories such as chisels, drift punches and wedges.

Examples: Hammers, hand axes, picks

Table A-05: Hand hammering tools

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
Power consumption ≤ 500 W length ≤ 400 mm and weight ≤ 1.5 kg BV: 18	Power consumption ≤ 800 W length ≤ 750 mm and weight ≤ 3.0 kg BV: 28	—	—	—
<p><i>Note: These tools are tools which are usually not commercially available but are conceived or provided especially for certain purposes at the test. If appropriate, sources of electricity not exceeding the working voltage (max. 240 V) may be used for attacks against electro-mechanical security devices.</i></p> <p>Table A-06: Specially made tools</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
weight ≤ 3.0 kg and Power consumption ≤ 500 W BV: 7	Power consumption ≤ 800 W BV: 11	Power consumption ≤ 1,350 W BV: 25 Plus an addition for a drilling rig BV: 11	—	—
<p><i>Note: These tools are used to drill or cut (without impacting option) and their working energy is supplied by a source of electricity.</i></p> <p>Examples: Drilling machines</p> <p>Table A-07: Electric powered tools, without impact</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
—	Power consumption ≤ 800 W and single blow energy ≤ 6 J BV: 11	Power consumption ≤ 1,350 W and single blow energy ≤ 15 J BV: 25	—	—
<p><i>Note: These tools are electric drilling machines which can be used with or without impacting option.</i></p> <p>Examples: Hammer drills, jack hammers, concrete breakers</p> <p>Table A-08: Electric powered rotary tools, with impact option</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
—	Power consumption ≤ 800 W and single blow energy ≤ 6 J BV: 11	Power consumption ≤ 1,350 W and single blow energy ≤ 20 J BV: 25	—	—
<p><i>Note: These tools are used for hammering, breaking up or deforming.</i></p> <p>Examples: Building hammers</p> <p>Table A-09: Electric powered impacting machine tools, without rotation</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
—	Power consumption ≤ 800 W BV: 14	Power consumption ≤ 2,300 W and with abrasive disc BV: 25 or diamond disc BV: 35	Power consumption ≤ 2,300 W and with: a rig and a drill with length ≤ 450 mm BV: 49 or length ≤ 1,000 mm BV: 63	Power consumption ≤ 11,000 W and with: a drill with length ≤ 450 mm BV: 245 or length ≤ 1,000 mm BV: 300 or wall saw BV: 245
<p><i>Note: These tools are used for cutting or abrasion.</i></p> <p>Examples: Electric disc cutters, diamond core drills</p> <p>Table A-10: Electric power grinding/slitting machine tools</p>				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
-	Oxygen consumption ≤ 50 l/min ¹⁾ BV: 14	Oxygen consumption ≤ 250 l/min ¹⁾ BV: 28	Oxygen consumption ≤ 750 l/min ¹⁾ BV: 42 plus an addition for the power source current ≤ 350 A BV: 25	Oxygen consumption ≤ 1,500 l/min ¹⁾ BV: 70
¹⁾ At standard ambient temperature and pressure, purity > 99,0 % <i>Note: These thermal tools receive the necessary energy either by an exothermic chemical reaction (heating/cutting gas, solid material/cutting gas) or by arc cutting.</i> Examples: Gas cutting and welding, oxygen lance, electric cutting and welding Table A-11: Thermal cutting/melting tools				

Tool category (BV: Basic value in RU)				
A, B, C, D or S	B, C, D or S	C, D or S	D or S	S
HSS-drill ¹⁾ BV: 1 Saw blade BV: 1 Chisel BV: 1 Wedge BV: 1 Punch BV: 1	HSS/carbide tipped drills BV: 2 Saw blade BV: 2 Chisel/bit BV: 3 Disc Ø ≤ 125 mm and thickness ≥ 2.5 mm BV: 4 Nozzle BV: 4	HSS/carbide tipped drills BV: 3 Chisel/bit BV: 4 Disc Ø ≤ 230 mm and thickness ≥ 2.5 mm BV: 5 Diamond disc with Ø ≤ 230 mm BV: 14 Nozzle BV: 5	Rod with Ø ≤ 16 mm BV: 6/m Lances/electrodes Ø outside ≤ 6.5 mm length ≤ 1,200 mm BV: 10 Lances/electrodes Ø outside ≤ 7.0 mm Ø inside ≤ 3.5 mm length ≤ 450 mm BV: 8 Nozzle BV: 6 Diamond core drill length ≤ 450 mm BV: 14 Diamond core drill length ≤ 1,000 mm BV: 28	3 m oxygen lance BV: 32 Diamond core drill length ≤ 450 mm BV: 70 Diamond core drill length ≤ 1,000 mm BV: 140 Disc for wall saw BV: 70
¹⁾ HSS = High speed steel <i>Note: These tools include drills, saw blades, abrasive discs, nozzles, electrodes. They are consumable and/or replaceable objects, used together with tools of Tables A.1 up to A.11. Their use is represented by a basic value.</i> Table A-12: Accessories for tools of tables A-01 up to A-11				

Tool category (BV: Basic value in RU)				
A	B	C	D	S
Tool coefficient: 5 RU/min	Tool coefficient: 7.5 RU/min	Tool coefficient: 10 RU/min	Tool coefficient: 15 RU/min	Tool coefficient: 35 RU/min
Hook BV: 1 Line BV: 1 Wire BV: 1 Commercial fishing device BV: 5	-	acids / alkali fluids per litre used BV: 7	-	
<p><i>Note: This group includes tools, special procedures and devices which cannot be subsumed in the defined tools but still are to be taken into account. Their use is to be timed.</i></p> <p>Examples: Battery lamps, cooling/cutting agents, chemicals, hydraulic equipment, fibre optic and electronic devices, hooks, fishing devices</p> <p>Table A-13: Miscellaneous tools</p>				

Tool category (BV: Basic value in RU)	
Equipment	BV
Measuring equipment	0
Torch	1
Mastic/foam per used 300 ml	7
Jack \leq 30 kN	7
Rigid endoscope	14
Flexible endoscope	35
Hydraulic equipment \leq 200 kN and for each pressure application	35
<p><i>Note: These are tools used to enhance testing work. Their use is not timed but represented only by a basic value.</i></p> <p>Examples: Torches, endoscopes, electronic devices</p> <p>Table A-14: Non tools</p>	

Annex B – Changes to pre-version

- The guidelines are based on the standard for secure storage units „DIN EN 1143-1:2012-07“. (Paragraph 1.1).
- The validity starts by 1st November 2012 (paragraph 1.2).
- The resistance against attacks with explosive gas mixtures as proved is no more set out as “Gas-Ex” but “GAS”, as the requirements and the classification scheme are now identical to the European standard (paragraph 3 ff.).
- Note on additional requirements and test methods for strongrooms according to VdS 2451 included in clause 4.2.1 and 5 in addition to clause 7.5.3.2.
- Amendment of the requirements for bolt work cover plate that it shall not be possible to take these off without traces by persons which are not authorized (clause 4.2.3).
- Optional test of the resistance against attacks with gas explosives for freestanding safes is not more foreseen (clause 4.4).
- Optional test of the resistance against attacks with explosive gas mixtures for safes for automatic teller machines (ATM) is no more foreseen for grades L to VIII but for grades II to VIII (clause 4.4.).
- Amendment of the note that resistance values for the post-detonation works in case of EX-attacks at freestanding safes are referring to a partial access (table 4-01).
- Reduction of the required resistance values for the attack test with tools on the fixing attachments for ATM safes of grade L and I from 50 to 30 RU (table 4-02).
- Extension of the requirements by additional requirements for the postanchoring works after an anchoring test for ATM safes (table 4-02).
- Change of table where the test on “GAS” for ATM safes is no more applicable at grades L to VIII but only for grades II to VIII (table 4-02).
- Amendment of the note that the resistance values for the post-detonation works in case of EX- and GAS-attacks for FSS for ATM are referring to a partial access (table 4-02).
- Amendment of the note that the resistance values for an attack on strongrooms and strongroom doors by a core drill are referring to a complete access (table 4-03).
- Amendment to necessary indications on the quality of concrete for strongrooms in massive construction in analogy to the European standard inclusively the note on additional requirements and test methods for strongrooms according to VdS 3451 (clause 5).
- Amendment included that for an optionally usable ATM-base the test may be performed either with or without the base which is determined by the test laboratory (clause 6).
- The attack test on the mounting of safes for ATM including an ATM-base – if existing – is specified (clause 7.5.4.4).
- The test procedure, the requirements and test criteria for the test of the fixing of ATM safes have been revised in analogy to the European standard (clause 8.2 ff). The test on flexible ATM-bases this way is also possible.
- Change of the test criteria for EX-attacks from complete access to partial access. In the course of the test it is tried to achieve a partial access (clause 9.5.1).
- Additional note that tool basic values which are used for preparation of the EX-test will not be added for the RU-calculation if used for possible post-detonation works (clause 9.6).
- The description of the test on resistance against attacks with explosive gas mixtures has been concretised regarding the test exclusively intended for ATM safes (clause 10.1 ff).
- Explanatory note in addition to the requirements of VdS 2344, that the test respectively the test report is not similar to a certificate of conformity (clause 12).
- Editorial changes.