



Locking Systems

Requirements and Test Methods

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VdS-Guidelines for Physical Security Devices

Locking Systems

Requirements 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 General

1.1 Scope

These guidelines contain minimum requirements for locking systems as well as for locking cylinders used in locking systems. The guidelines are valid together with VdS 2156-1 und VdS 2156-2.

These guidelines are not valid for locking cylinders with individual locking function or for electronic locking assemblies as specified in VdS 2215.

The applicability of locking cylinders for the use in locking systems is reported exclusively in the certificate of the cylinders` VdS-approval. So the manufacturer of these cylinders has the right to compose and to attest VdS-approved locking systems.

When developing a locking system it has to be considered which areas are rated security-relevant on the customer`s part. If necessary, the manufacturer should be of help with rating the security-relevant areas because typically not all areas of a locking system need to meet high security requirements.

The VdS-approval is valid for the entire locking system (similarly for security-relevant and not security-relevant areas), as far as the developing and composing of the system is attested by the manufacturer regarding these guidelines.

Note: Locking cylinders being part of a locking system shall be used in ancillary control equipment (ACE) of intruder alarm systems (IAS) only if for the authorisation of unsetting the IAS an additional identification feature is being evaluated (cp. VdS-certificate of ACE as well as VdS 2311, Guidelines for Intruder Alarm Systems, Planning and Installation) or if the cylinders explicitly are approved for this application .

1.2 Validity

These guidelines are valid from 2012, July 1st; they replace the guidelines VdS 2386 : 2007-11 (02).

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 publications. The normative references are cited at the appropriate places in the clauses, the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to these guidelines only when announced by a change of these guidelines. For undated references the latest edition of the publication referred will be applied.

DIN EN 1303	2005-04 Baubeschlage, Schliezylinder fur Schlosser; Anforderungen und Prufverfahren (Hardware, locking cylinder for locks; requirements and test methods)
DIN 18252	2006-12 Schliezylinder fur Turschlosser: Begriffe, Mae, Anforderungen, Kennzeichnung (Locking cylinder for door locks, terms and conditions, measurements, requirements and marking)
VdS 2156-1en	Guidelines for Physical Security Devices, Locking Cylinders with Individual Locking Function, Requirements and Test Methods
VdS 2156-2en	Guidelines for Physical Security Devices, Locking Cylinders with Individual Locking Function, Requirements and Test Methods, Part 2: Electronic Locking Cylinders

- VdS 2215** Richtlinien für mechanische Sicherungseinrichtungen, Schließsysteme, Anforderungen und Prüfmethode
(Guidelines for physical security devices, locking systems, requirements and test methods)
- VdS 2311en** Guidelines for Intruder Alarm Systems, Planning and Installation
- VdS 2344en** Procedures for Testing and the Approval of Equipment, Components and Systems Used in Fire Protection and Security Technology

3 Terms and definitions

For general terms and definitions refer to DIN 18252 and DIN EN 1303, clause 3. In addition the following definitions apply:

Individual locking function: The individual locking of a cylinder, which is not a part of a master key system.

Ancillary control equipment (ACE): Operating device for setting/unsetting of intruder alarm systems (IAS).

Locking system: Any quantity of individual locking cylinders which are combined to a functional unit. Regarding the design central locking systems, master key systems and general master key systems are differentiated.

Central locking system: Locking system in which a multiple of different keys can control one or more central locking cylinder.

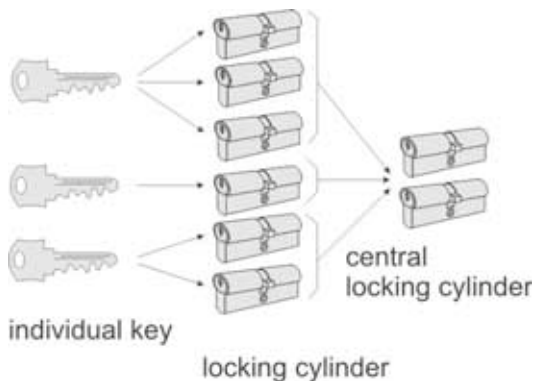


Figure 3.01: Central locking system

Master key system: Locking system implying a master key that is able to control every locking cylinder in the system.

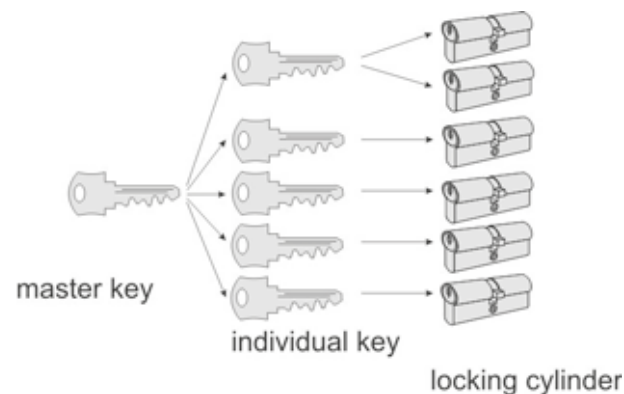


Figure 3.02: Master key system

General master key system: Locking system which organisational functionality is extended compared with master key systems by the aid of general master keys, main group keys and/or group keys.

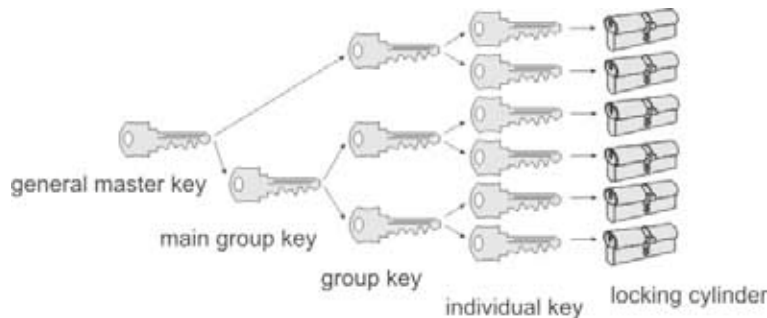


Figure 3.03: General master key system

Security relevant area: Area of a locking system being secured by locking cylinders for which regarding the burglary protection the same requirements are valid as for VdS-approved locking cylinders with individual locking function.

Notice: In the technical documentation manufacturers should point out that locking cylinders for security relevant areas should not be stored (neither freely accessible nor hidden) in freely accessible respectively poorly secured key cabinets.

4 Classification

According to their design locking systems are differentiated as follows:

- Model type central locking system (Z¹⁾)

In security relevant areas of locking systems of model type Z locking cylinders at least of VdS class A respectively AZ are used. These locking cylinders besides the higher requirements of the guidelines VdS 2156-1 respectively 2156-2 meet the requirements according to DIN 18252, class 21, 31 or 71.

Locking cylinders of class A respectively AZ provide a basic burglary protection.

- Model type master key / general master key system (HS/GHS²⁾)

In security relevant areas of locking systems of model type HS/GHS locking cylinders of VdS class B, BZ, C respectively CZ shall be used. Locking cylinders of class B respectively BZ besides the higher requirements of the guidelines VdS 2156-1 respectively 2156-2 meet the requirements according to DIN 18252, class 42 or 82.

An equivalent of class C locking cylinders regarding the security against unauthorised opening according to DIN 18252 is not given.

Locking cylinders of class B respectively BZ provide a medium burglary protection.

Locking cylinders of class C respectively CZ provide a high burglary protection.

¹⁾ German term: “Zentralschließanlage“

²⁾ German term: “Hauptschließanlage; Generalhauptschließanlage“

5 Requirements

The requirements VdS 2156-1 respectively VdS 2156-2 are valid with the following deviations and/or additions.

Regarding the cross reference on the Guidelines VdS 2156-1 it is valid that the Guidelines VdS 2156-1 : 2007-09 (07) may be used until 2016, June 30th. After this period of time only the requirement of 2156-1 : 2012-07 (08) are valid.

5.1 Locking cylinders

In addition to VdS 2156-1 mechanic locking cylinders used in security relevant areas of locking systems shall fulfil the following requirements.

5.1.1 Detainers

For the number of pins as shown in table 5.01 no split pins or comparable multiple partitions shall be used in locking systems for security relevant areas.

Locking cylinders of class	Detainers without split pins
A, AZ	at least 4
B, BZ, C, CZ	at least 5

Table 5.01: Detainers

5.1.2 Effective varieties

For one key profile for the use in security relevant areas the number of effective varieties shown in table 5.02 shall not be used within the respective locking system.

Locking cylinders for locking systems of model type	Effective varieties not to be used
A, AZ	at least 29,999
B, BZ	at least 99,999

Table 5.02: Effective varieties

Varieties needed for the locking systems functions shall be given additionally.

Deviating from DIN EN 1303, clause 3.2, only those moving detainers are considered for the calculation of the effective varieties, that are depending and double active and make a higher level possible.

5.1.3 Dimensions of locking systems

Regarding the a.m. restrictions a locking system (model type HS/GHS) shall allow at the least 30 locking cylinders for servicing security relevant areas.

The separation of security relevant areas shall be realised neither exclusively by variation of the key profile nor by using of detainers not being depending and/or double active.

5.1.4 Keys

No key profiles of locking cylinders with coded individual locking functions shall be used in locking systems.

Keys for locking systems of model type HS/GHS shall additionally dispose of features, as e.g. industrial property right (protection by patent, registration of design), specific construction features, which impede the illegal purchase of duplicate keys significantly.

The subsequent delivery of keys and/or locking cylinders for locking systems of model type HS/GHS shall only be carried out by the manufacturer himself against presentation of the legitimization (e.g. security card).

The additional supply of original keys for systems of the model type HS/GHS is done only by the manufacturer or by exclusive retailers chosen by the manufacturer under the following aspects:

- The retailer is committed to only fabricate a key if the security card is shown.
- **Every** skeleton key given to the retailer by the manufacturer has to be marked so that an identification of the retailer is possible.





If the handling with skeleton keys is not meeting the named requirements the retailer has to be banned from a further supply with skeleton keys.

The validity period of the industrial key profile protection shall at least meet the validity period of the VdS approval according to VdS 2344, clause 2.3.

Note: Locking systems in use do not lose their VdS-approval by this; grandfathering is given. This applies for replacement delivery, only, not for the expansion of given locking systems.

5.1.5 VdS marking for end-users

Deviating from the regulations given in VdS 2156-1 regarding to the end-user labelling it is given that the locking cylinders may be marked as shown below. A labelling of the package is not intended.

class	product lable ¹⁾
A	
AZ	
B	
BZ	

1) The approval owner may purchase the lables from VdS as pixle or vector file.

For using the VdS marking for end-users the regulations given in VdS 2344 for using the VdS-lable apply analogously.

5.2 Locking system

5.2.1 Declaration of the manufacturer

In addition to the technical documentation according to DIN 18252, clause 8.3, the manufacturer shall deliver a declaration according to annex A.

5.2.2 Documentation of the system

When handing over the locking system to the system user the conformity of the system with these guidelines shall be confirmed in writing.

The locking plan shall show the positions of the locking cylinders for security relevant areas.

The system user is to be informed about the documentation of the locking system as well as about the necessity of a precise administration of the locking system. In particular the risk by losing keys and by keys that can not be related to an individual user shall be named. Furthermore the system user shall receive information that changes of the system structure with effects to the locking plan have to be agreed upon with the manufacturer.

5.2.3 Administration of the locking system

The manufacturer shall provide a software to the system user to enable an EDP-based administration of the locking system

The software shall at least include the following features:

- EDP-controlled administration program for locking systems based on an up-to-date operating system (M, E)
- interface for importing data regarding the locking system that are stored by the manufacturer by data medium or file transfer (M)
- possibility for importing data regarding the locking system as well as delivery of part of these data according to customers request (upgrading, reorder) (M)
- keyword protection for guaranteeing the data security (M, E)
- availability of standard forms for delivering and retraction of keys, ordering keys and locking cylinders, of locking plans and the like (M, E).
- administrating the keys on their status, e.g. “delivered”, “placed in storage”, “lost” (M, E)
- administrating the locking cylinders on their status, e.g. “mounted”, “damaged”, “ordered” (M, E)
- display of access authorisations regarding keys respectively persons (M, E)
- evaluating of stock of keys and locking cylinders (M, E)
- planning of possible upgradings of the locking system (E)

M: required for locking systems realised with mechanic cylinders

E: required for locking systems realised with electronic cylinders

6 Test methods

6.1 Test matrix

The tests of the requirements shown in clause 5 are carried out on basis of the technical documentation.

Step	Test	Clause VdS 2386
1	Constructive features	6.2.1
2	Key profile	6.2.2
3	Declaration of the manufacturer	6.3.1
4	Documentation of the locking system	6.3.2
5	Administration software	6.3.3
6	Additional tests	6.4

Table 6.01: Test matrix

6.2 Locking cylinders

6.2.1 Constructive features

On basis of the technical documentation it is tested if a locking system with the minimum number of locking cylinders for security relevant areas as named in the declaration of the manufacturer can be realised technically considering the given cylinder construction and the requirements according to clauses 5.1.1 to 5.1.3.

6.2.2 Key profile

It is tested whether for locking cylinders of locking systems no key profiles (e.g. pattern of the steps, pattern of the front, hole pattern etc.) of cylinders with coded individual locking function are used and if key profiles for locking cylinders of class B (use in locking systems of model type HS/GHS) dispose of features that impede the providing of duplicate keys significantly (cp. clause 5.1.4).

Furthermore it is tested if the subsequent delivery of keys and/or locking cylinders for locking systems of class B is only carried out by the manufacturer himself against presentation of the security card (legitimation).

6.3 Locking system

6.3.1 Declaration of the manufacturer

It is tested if the declaration of the manufacturer according to annex A is handed in.

6.3.2 Documentation of the system

It is tested if the documentation of the locking system contains the essential information for the user regarding clause 5.2.2 and if the positions of the locking cylinders for the security relevant areas are shown in the locking plan.

6.3.3 Administration software for locking systems

With the data of a locking system sample it is tested if the requirements regarding the administration software for locking systems according to clause 5.2.3 are fulfilled.

6.4 Additional tests

New constructions or production methods as well as new opening tools or methods may require additional tests.

Changes

- complement of chapter "Requirements" regarding the use of the changed requirements for locking cylinders with individual locking function, VdS 2156-1
- complement of chapter 4 – model type "Z" with the expression "at least", to allow the use of locking cylinders of higher classes
- clarification that chapter 5.1 refers to mechanic cylinders only
- complete revision of the chapters 5.1.1 and 5.1.2
- trademark protection, regulation regarding the additional delivery of keys through retailers; note regarding grandfathering added to chapter 5.1.4
- addition of chapter 5.1.5 – VdS marking for end-users
- clarification in chapter 5.2.2 and 5.2.3 which requirements are valid for mechanic and/or electronic locking cylinders
- specification of the requirements by bracket term in chapter 6.2.2

Declaration of the manufacturer (normative)

Declaration

With this we declare, that for manufacturing of the locking system on basis of the locking cylinder model _____ in our factory _____ the following organizational measures were taken:

Code variations

A permutation table was created, according to which at random _____, _____ code variations can be produced. The requirements regarding DIN EN 1303, clause 4.7.3 and DIN 18252, clauses 7.1.1 to 7.1.6 are considered.

Keys

For locking cylinders with individual locking function and locking cylinders for locking systems differing key profiles are used. For locking cylinders for locking systems only protected key profiles are being used; we will not deliver blank keys or these.

The delivery of copies of keys or cylinders with the same code requires the presentation of the legitimation approval.

The key profile protection is valid for the next _____ years to come.

Planning and realisation of locking systems

Security relevant areas are identified and considered when planning locking systems.

Criteria as shown in the following are considered when creating locking systems:

No split pins are applied when using locking cylinders of class A for security relevant areas of model type Z locking systems in **four** detainers and when using locking cylinders of class B for security relevant areas of model type HS/GHS locking systems in **five** detainers.

The locking system will be constructed in a way that for cylinders of class A **for every single key profile** at the least 29,999 of possible varieties are not used in the system. For cylinders of class B at the least 99,999 of the possible varieties are not used in the system.

Considering the a.m. restrictions a master key system with _____ differing locking cylinders for security relevant areas can be created.

Locking cylinders of a system which do not fulfil the requirements for cylinders for security relevant areas (e.g. more detainers with split pins), will not be signed with the mark of VdS compliant cylinders.

Date

Stamp and signature of authorised representative
of manufacturing site

