BS EN 1143-2:2014

BSI Standards Publication

Secure storage units — Requirements, classification and methods of tests for resistance to burglary

Part 2: Deposit systems

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National foreword

This British Standard is the UK implementation of EN 1143-2:2014. It supersedes BS EN 1143-2:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GW/2, Secure storage of cash, valuables and data media.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Wertbehältnisse - Anforderungen, Klassifizierung und Methoden zur Prüfung des Widerstandes gegen Einbruchdiebstahl - Teil 2: Deposit-Systeme

This European Standard was approved by CEN on 20 December 2013.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1143-2:2014) has been prepared by Technical Committee CEN/TC 263 “Secure storage of cash, valuables and data media”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2014, and conflicting national standards shall be withdrawn at the latest by November 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1143-2:2001.

The main changes of EN 1143-2:2014 compared to EN 1143-2:2001 are as follows:

a) Editorial - Restructuring and rewording

The text has been restructured and reworded to make the standard easier to read and understand. Mainly the test clauses of deposit system attacks have been changed so the cross-references in the document are reduced.

A new tool list (Annex C) of “Additional tools for deposit tool attack tests (manipulation and fishing devices)” has been added.

b) Technical - Implementation of relevant additions and changes in EN 1143-1 since 2001

During the period from December 2001 when the second part of EN 1143 (EN 1143-2) was issued up to now, part 1 of the standard (EN 1143-1) has been reviewed several times and two amendments have been published.

Furthermore:

— CD attacks as in EN 1143-1:1997 have not been implemented as an option;

— GAS explosive attacks as in EN 1143-1:2012 have been implemented as an option (see 9.4 and 10.4).

c) Fixing system test

Night safes and deposit safes now have the identical test procedure on their fixing system (see Clause 11). The anchoring test now complies with that of ATM safes according to EN 1143-1:2012. It is first attempted to remove or weaken any external fixings, then a force is applied and afterwards a tool attack test on the fixing attachments is performed.

d) Updating of references

The references in the existing standard were out of date and were therefore updated.

e) Reduction of the scope

The scope has been reduced so the standard is valid only for deposit systems with receiving units (when closed) having at least one internal side ≤ 1 m (see 4.3).

f) Distributed systems

Requirements of distributed systems were added (see 4.4.3). Examples of integrated and distributed deposit systems are given in Annex B.

This European Standard is one of a series of product standards for secure storage units of different types.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard gives the possibility to classify deposit systems according to their resistance to burglary attacks. The laboratory tests simulate known attack methods and such methods and tools which are supposed to be used for attacking these types of products.

Human intervention tests are included. The results and repeatability of these depend on the skill of the testing team. Testing laboratories are therefore recommended to participate in inter-laboratory activities to ensure that the standard is used in an overall common approach. Otherwise, results from different laboratories may differ too much.

The tests and requirements in this standard are based on the following assumptions (conditions) of use and installation of deposit systems:

Deposit safe: For deposit safes, the depositing functions are inside the premises of the company and are only intended to be disposable for the authorized personnel of the company. It is assumed that the authorized personnel carry out the depositions. Deposit safes are installed so the deposit functions are not available for the public. It is also assumed that a burglar does not have the code or key to the deposit functions for some kind of attacks.

Night safe: For night safes, the depositing functions are available to customers of financial institutions and, if locked, are disposable only for the authorized personnel of the customer. Night safes are installed so the deposit functions are available also for the public. It is also assumed that a burglar may have the code or key to the depositing functions.

Receiving units are basically safes according to EN 1143-1 which have apertures necessary for operation of the deposit system.

Examples of different design of deposit systems are given in Annex A.

Deposit systems are classified in a system of grades, corresponding to that of EN 1143-1. In addition, there are requirements and test methods for burglary and manipulation of the deposit system functions.

1 Scope

This European Standard specifies requirements and tests methods for deposit systems, and classifies the systems according to their burglary resistance and their resistance to the theft of deposits.

This European Standard comprises two types of deposit system:

— **Night safes** which provide depositing services for the customers of financial institutions without giving access to the content of the night safe.

— **Deposit safes** which enable the personnel of a company to place money or valuables in safe custody without giving access to the content of the deposit safe. The installation condition for deposit safe according to this European Standard is that the depositing functions are installed inside the premises of the company and are only disposable for the personnel of the company.

NOTE Parts of a deposit system are a receiving unit, an input unit and in some cases, a chute.

This European Standard includes design requirements for deposit systems controlled by programmable controllers and for the software for these. Controller hardware testing is restricted to mechanical or electromechanical attacks of electric motors, sensors, coils and similar devices; but software testing as attempts to influence controller software or controller hardware is not part of this standard.

Deposit systems may have devices for functions such as user identification and/or counting and registration of money. Tests of and requirements for classification of such functions are not included.

This European Standard does not cover protection of persons using the deposit system or the prevention of fraud committed by operators of the deposit system.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1143-1:2012, *Secure storage units - Requirements, classification and methods of test for resistance to burglary - Part 1: Safes, ATM safes, strongroom doors and strongrooms*

EN 1300, *Secure storage units - Classification for high security locks according to their resistance to unauthorized opening*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1143-1 and EN 1300 and the following apply.

3.1 Deposit system definitions

3.1.1
deposit system
assembly of a receiving unit and an input unit and optionally a chute for their inter-connection and with all features for depositing and protection

Note 1 to entry: Deposit systems can be either deposit safes or night safes.

Note 2 to entry: A deposit system serves the purpose to securely accept and securely store deposits of cash and/or valuables.

3.1.2
deposit safe
deposit system whose requirements are related to the security provisions needed to enable employees to deposit into the receiving unit without having to unlock the receiving unit door

Note 1 to entry: The input unit of this system is intended to be used only by the employees and not be placed in a public area.

3.1.3
night safe
deposit system whose security requirements relate to use by financial institutions for providing a secure receiving service for customer deposits without having to unlock the receiving unit door

Note 1 to entry: The input unit of this system are intended to be used by the customers of financial institutions and can be placed in a public area.

3.1.4
receiving unit
secure storage unit with openings necessary to accommodate a deposit system

3.1.5
internal space
interior of the receiving unit which is bounded by the inside surfaces and the boltwork cover plate(s) of the door of the receiving unit body and excluding parts of the chute or input unit (if any) inside the receiving unit

3.1.6
design capacity
usable internal space for storing deposits

3.1.7
input unit
user-access facility into which deposits are placed for passing into the receiving unit

Note 1 to entry: Access to input units may be controlled by locks or devices that may provide identification of the depositor.

Note 2 to entry: In this context ‘input unit’ refers to the device intended for deposit items, as opposed to the input unit for locks in EN 1300.

3.1.8
chute
optional connection between input unit and receiving unit through which the deposit passes

3.1.9
deposit
item placed into the input unit and intended for passing into the receiving unit

Note 1 to entry: The deposit may be money or valuables that are deposited in special containers, bags or envelopes, or single bank notes or bunches of bank notes.

3.1.10
integrated deposit system
deposit system controlled by programmable controllers in which the physical deposit sequences cannot be changed through links to devices outside the receiving unit

Note 1 to entry: For an example of integrated deposit system, see Annex B.

Note 2 to entry: It is permitted that the controller of the integrated deposit system transmits data about the system status and events.

3.1.11
distributed deposit system
deposit system controlled by programmable controllers in which the physical deposit sequences can be changed through links to devices outside the receiving unit

Note 1 to entry: For an example of distributed deposit system, see Annex B.

3.1.12
base
any part of a deposit system which is between the receiving unit and the surface to which it is to be anchored

Note 1 to entry: A base is used to place a deposit system input unit at a convenient height for use.

3.1.13
deposit sequence
all steps in the cycle that a deposit system performs from when it has been activated by the depositor and until the system has returned to the position from where it can be activated again

3.1.14
controller unit
device consisting of electronic hardware and software and have the purpose to operate the deposit sequence

3.1.15
remote access
communication from outside the receiving unit, through a data link that gives the possibility to control / influence the deposit sequence of a distributed system

3.2 Deposit tool attack definitions

NOTE The deposit tool attacks in 3.2.1 to 3.2.7 are different types of attacks with the intension to remove one or several deposits from the deposit system. Detailed information about conditions for testing and criteria's are in Clause 10.

3.2.1
forcing
destructive attack with the intention to remove several deposits from the receiving unit

3.2.2
forcing EX
destructive attack including plastic explosives with the intention to remove several deposits from the receiving unit

3.2.3
forcing GAS
destructive attack including gas explosives with the intention to remove several deposits from the receiving unit

3.2.4
deposit retrieval
manipulative non-destructive attack without leaving traces with the intention to remove one deposit from the receiving unit

3.2.5
fishing
manipulative non-destructive attack with the intention to remove several deposits from the receiving unit from the still functioning deposit system

3.2.6
trapping last deposit
manipulative attack by means of introduction of devices that prevent one deposit from reaching the receiving unit and then to remove it from the deposit system

3.2.7
repeated trapping
manipulative attack by means of introduction of devices that prevent several deposits from reaching the receiving unit and then to remove them from the still functioning deposit system

4 Classification and requirements

4.1 Classification

Deposit systems are classified in different grades according to Table 1. Deposit safes are designated with “D” and night safes are designated with “N”. In addition to the basic grades there are two possible options: “EX” and “GAS”. These can be individual or in combination with each other (for example N-V EX GAS).

The “EX” indicates that the deposit system also complies with the requirements for Partial access EX – explosive tool attack test and Deposit forcing EX tool attack test.

The “GAS” indicates that the deposit system also complies with the requirements for Partial access GAS – explosive tool attack test and Deposit forcing GAS tool attack test.

Table 1 — Possible classifications of deposit systems

Deposit safe (D) classification			Night safe (N) classification		
Basic grading	Options [a]		Basic grading	Options [a]	
	EX	GAS		EX	GAS
D-0	—	—	—	—	—
D-I	—	—	—	—	—
D-II	D-II EX	D-II GAS	N-II	N-II EX	N-II GAS
D-III	D-III EX	D-III GAS	N-III	N-III EX	N-III GAS
D-IV	D-IV EX	D-IV GAS	N-IV	N-IV EX	N-IV GAS
D-V	D-V EX	D-V GAS	N-V	N-V EX	N-V GAS
—	—	—	N-VI	N-VI EX	N-VI GAS
—	—	—	N-VII	N-VII EX	N-VII GAS
—	—	—	N-VIII	N-VIII EX	N-VIII GAS
—	—	—	N-IX	N-IX EX	N-IX GAS
—	—	—	N-X	N-X EX	N-X GAS
NOTE The basic grade limits are the same as those of EN 1143–1 where applicable.					
[a] All additional requirements for EX respective GAS shall be fulfilled.					

4.2 General requirements

4.2.1 Holes in protection material

There shall be no holes through the protection material of an input unit or chute other than those necessary for user identification (e.g. locks, card readers, etc.), cables, and insertion of deposits.

There shall be no holes through the protection material of a receiving unit other than those for locks, cables, anchoring and the aperture for the input unit or chute.

4.2.2 Cable hole

Deposit systems of grade III and higher shall either have a hole for a cable or a preparation enabling a connection to be made to an alarm system after the secure storage unit has been installed.

Unused cable entry openings shall be obstructed or plugged by means that cannot be removed from the outside without leaving visible traces.

4.2.3 User instructions

Deposit systems shall be provided with instructions for:

— operating and maintenance, including instructions in respect of the locks,

— anchoring,

— system installation for built-in deposit systems,

— deposit sizes recommended,

— the depositor.

4.3 Requirements for receiving units

4.3.1 Dimensions

The receiving unit shall, when closed, have at least one internal side ≤ 1 m.

4.3.2 Boltwork cover plate

Receiving unit shall have an internal boltwork cover plate which prevents unauthorized viewing of the locks and boltwork, and access to them, when the door is open. Boltwork cover plates shall be secured so that they cannot be opened or removed by an unauthorized person without leaving visible traces.

Boltwork cover plates may be secured so that they only can be opened or removed by using the correct key or code or by breaking a seal.

4.3.3 Locks: number and class

The receiving unit shall be fitted with locks conforming to EN 1300, in accordance with Tables 2 and 3.

Time locks and/or time delay locks may be mounted in addition to the locks listed in Tables 2 and 3.

4.3.4 Partial and complete access

When tested in accordance with Clause 9, the receiving unit shall provide the resistance value to complete access and partial access, partial access EX (optional), partial access GAS (optional) specified in Tables 2 and 3 for the relevant grade.

These requirements do not apply to the aperture for the input unit or chute.

4.3.5 Fixing system

Receiving units in deposit systems shall have a fixing system by which they can be anchored. When tested in accordance with 11.1 and 11.2, the fixing system shall provide the resistance values specified in Table 2 and Table 3 for the relevant grade.

Table 2 — Minimum requirements for deposit safe (D) receiving unit

Grade	Tool attack resistance values Requirements are expressed in Resistance Units (RU)						Locks according to EN 1300	
	Complete Access	Partial Access			Fixing system			
		General	Options		Test without force	Test with force[a]	Qty	Class
			EX	GAS				
D-0	30	30	–-	–-	30	18	1	A
D-I	50	30	–-	–-	30	18	1	A
D-II (EX, GAS)	80	50	4	4	50	22	1	A
D-III (EX, GAS)	120	80	6	6	50	22	1	B
D-IV (EX, GAS)	180	120	9	9	50	22	2	B
D-V (EX, GAS)	270	180	14	14	50	22	2	B

[a] For Grade D-0 to Grade D-III applicable force is maximum 50 kN. For Grade D-IV and Grade D-V applicable force is maximum 100 kN. (See 11.1 and 11.2)

Table 3 — Minimum requirements for night safe (N) receiving unit

Grade	Tool attack resistance values Requirements are expressed in Resistance Units (RU)						Locks according to EN 1300	
	Complete Access	Partial Access			Fixing system			
		General	Options		Test without force	Test with force[a]	Qty	Class
			EX	GAS				
N-II (EX, GAS)	80	50	4	4	50	22	1	A
N-III (EX, GAS)	120	80	6	6	50	22	1	B
N-IV (EX, GAS)	180	120	9	9	50	22	2	B
N-V (EX, GAS)	270	180	14	14	50	22	2	B
N-VI (EX, GAS)	400	270	20	20	70	22	2	C
N-VII (EX, GAS)	600	400	30	30	120	22	2	C
N-VIII (EX, GAS)	825	550	41	41	160	22	2	C
N-IX (EX, GAS)	1050	700	53	53	210	22	2	C
N-X (EX, GAS)	1350	900	68	68	280	22	2	C

[a] For Grade N-II to Grade N-III applicable force is maximum 50 kN. For Grade N-IV to Grade N-X applicable force is maximum 100 kN. (See 11.1 and 11.2)

4.4 System requirements

4.4.1 General

System requirements are related to the resistance of removal of one or more deposits from the system under conditions specified under Clause 10 for different types of deposit tool attack tests.

Deposit systems in which the deposit sequence and other sequences are controlled by programmable controllers shall conform to 4.4.2 (for integrated deposit systems) and 4.4.3 (for distributed deposit systems).

4.4.2 Integrated deposit systems

4.4.2.1 Predefined deposit sequence and other predefined sequences shall be controlled by devices inside the receiving unit.

4.4.2.2 It shall not be possible to change the software containing the predefined sequences unless the receiving unit door is open.

4.4.2.3 The controller unit shall be secured by a protective cover. The cover shall not be possible to open or remove by an unauthorized person without leaving visible traces or result in operation failure. Means shall be provided to indicate that tampering of the controller unit has taken place.

4.4.2.4 From outside of the receiving unit it shall only be possible to initiate predefined sequences in the deposit system.

4.4.2.5 The software controlling the sequences of the deposit system capture shall be identified with a unique version number.

4.4.3 Distributed deposit systems

4.4.3.1 If the predefined deposit sequence and other predefined sequences are controlled or changed from outside the receiving unit, the control signals shall be protected by cryptography. The requirements for cryptography described in EN 1300 are applicable also for distributed systems.

4.4.3.2 The software controlling the sequences of deposit system shall be identified with a unique version number.

4.4.3.3 The controller unit shall be protected by a lock and access control such that unauthorized entry results in visible traces or in operation failure.

4.4.4 Resistance to deposit tool attacks

When tested in accordance with Clause 10, a deposit safe shall provide the resistance to forcing, forcing EX (option), forcing GAS (option), fishing and deposit retrieval specified in Table 4 for the relevant grade.

When tested in accordance with Clause 10, a night safe shall provide the resistance to forcing, forcing EX (option), forcing GAS (option), fishing, deposit retrieval, trapping last deposit and repeated trapping specified in Table 5 for the relevant grade.

Table 4 — Minimum requirements for deposit tool attacks for deposit safe (D)

Type of product and grade	Deposit tool attack minimum resistance values Requirements are expressed in Resistance Units (RU)				
	Forcing			Fishing	Deposit retrieval
	General	Options			
		EX	GAS		
D-0	30	—	—	30	30
D-I	30	—	—	30	50
D-II (EX,GAS)	50	4	4	50	80
D-III (EX,GAS)	80	6	6	80	120
D-IV (EX,GAS)	120	9	9	120	180
D-V (EX,GAS)	180	14	14	180	270

Table 5 — Minimum requirements for deposit tool attacks for night safe (N)

Type of product and grade	Deposit tool attack minimum resistance values Requirements are expressed in Resistance Units (RU)						
	Forcing			Fishing	Deposit retrieval	Trapping last deposit	Repeated trapping
	General	Options					
		EX	GAS				
N-II (EX,GAS)	50	4	4	50	80	20	50
N-III (EX,GAS)	80	6	6	80	120	30	80
N-IV (EX,GAS)	120	9	9	120	180	40	120
N-V (EX,GAS)	180	14	14	180	270	40	180
N-VI (EX,GAS)	270	20	20	270	400	40	270
N-VII (EX,GAS)	400	30	30	400	600	40	400
N-VIII (EX,GAS)	550	41	41	550	600	40	550
N-IX (EX,GAS)	700	53	53	700	600	40	700
N-X (EX,GAS)	900	68	68	900	600	40	900

5 Technical documentation

5.1 The technical information shall be available for the testing laboratory when starting the testing procedure.

Technical documentation shall contain the following information:

5.2 The date of issue and the name of the manufacturer or the name of the applicant requesting testing, on each page.

5.3 Statement of the type of product: deposit safe or night safe and type of receiving unit (free-standing or built-in receiving unit) together with a list of sizes covered by the same design.

The statement shall also give information about:

a) potential options (EX and GAS),

b) whether a base to the deposit system is included or is an option,

c) the design capacity.

5.4 Drawings of the test specimen, including the system sub-units, 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, boltwork and relocking devices (system comprising blocking and detecting elements which will prevent the boltwork from being withdrawn if a burglary attack is detected. A relocking device can be part of the locking mechanism (e.g. active or live relocker) or an independent unit (e.g. passive relocker));

d) quantity, pitch and position of door bolts, their dimensions (e.g. cross section), throw and engagements and their type (moving or fixed);

e) location and design of any local areas of special protection material;

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 the input unit, chute and receiving unit are joined to each other);

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, e.g. time locking and time delay locking;

i) in case of a base this shall be identified.

5.5 List of all the locks that may be fitted, giving the manufacturer and model number.

5.6 Specification of the materials of construction if not contained on the drawings.

5.7 Details of any materials or device(s) intended to generate gas, smoke, soot, etc., in the event of physical attack, or that could generate harmful substances during testing.

5.8 Statements of the nature and position of any cables and/or facilities for penetration detection systems, for the mounting of electro-mechanical securing devices, alarm devices, etc.

5.9 Instructions for installation, giving at least the following details:

a) method by which the deposit system is anchored to the floor or other surface. If a base is included in the deposit system the method by which the deposit system is anchored to the base and the base is anchored to the floor or other surface;

b) method of encasing built-in deposit systems, including:

1) the proportion of receiving unit to be encased;

2) the minimum size and section thickness of the encasement;

3) the minimum quality of encasement material; (the types and proportions of aggregates, cement and other constituents; the flow ability of the freshly prepared mass and the 28-day cube compression strength, together with methods of the test to measure these);

4) any reinforcement or anchoring to be included within the encasing mass.

5.10 For deposit systems that contain electric or electronic components, software, or pneumatically or hydraulically controlled or driven components, the following information:

a) list of the assemblies used (type and supplier); motors, gearboxes, harnesses, PCBs (printed circuit boards) etc.;

b) flow chart, state diagram or other description of the logical dependencies in the sequence of deposit capture;

c) hardware and software design specifications for all assemblies in the deposit system;

d) the unique version number of the software of an integrated or distributed system.

5.11 Specification of all possible deposits (sizes, material).

5.12 Written instruction covering:

a) operating and maintenance, including instructions in respect of the locks;

b) anchoring;

c) system installation for built-in deposit systems;

d) the depositor.

5.13 The required information for cryptography for distributed systems is given in EN 1300.

6 Test specimen

6.1 Tests shall be performed on a sample having a receiving unit and an input unit, and, if appropriate, a chute (see 6.5). Optional features (see 5.4 h) and i)) that could decrease the burglary resistance value shall be included in the test specimen. Optional features and accessories, such as time locking and time delay locking, that could increase the resistance value in the tool attack test, shall be removed or made inoperative during the test.

If the deposit system includes a base, according to the technical documentation, for any type of installation this shall be included in the test specimen.

If the applicant wants to make a change of design, an additional testing is needed of only the part or module of the deposit system. The test may be reduced to only that part or module if this will not influence the test result.

A test specimen which has previously been subjected to testing may be used if the previous testing will not influence the result of the test.

6.2 Cable holes (entrances) for detection systems and/or accessories specified in the documentation shall be present in the test specimen.

6.3 Test specimens for built-in or cast-*in situ* receiving units shall be constructed using the components supplied, and following the instructions for installation (see 5.9).

6.4 If the design of deposit system allows the system sub-units to be arranged differently (e.g. a system with or without chute, a chute of different design, length, base etc.), the various configurations shall all meet the requirements of this European Standard and each configuration shall be tested using an appropriate test specimen. Test specimens shall enable testing or evaluation of the various configurations.

6.5 Systems that incorporate (or may incorporate) a chute shall be tested with that chute. If the length of the chute is not fixed, the test sample shall have a chute of 1 m length.

6.6 Deposits to fill up the receiving unit during deposit tool attack tests (see 10.1.3).

7 Test program

The test program in Tables 6, 7 and 8 shows the type tests needed for classification of deposit systems. At least one test of each kind shall be performed. In addition, the test laboratory may perform exploratory tests of different types.

Before starting the testing of a deposit system, there shall be a specific plan including all tests to be performed according to the program. If parts or systems already have been tested these tests may be referred to in the test program.

Clause 9 gives specific information for planning and performing partial and complete access tests.

Clause 10 gives specific information for planning and performing deposit tool attack tests.

Clause 11 gives specific information for performing fixing system tool attack tests.

Table 6 — Summary of tests that shall be performed on all deposit systems in all applicable grades

Test	Category of attack	Part of attack
9.1.1a. Partial access – tool attack test	Burglary tool attack	Receiving unit
9.1.1b. Partial access – tool attack test (Additional)	Burglary tool attack	Receiving unit weakened areas (Not the aperture for the input unit or chute)
9.2.1a. Complete access – tool attack test	Burglary tool attack	Receiving unit
9.2.1b. Complete access – tool attack test (Additional)	Burglary tool attack	Receiving unit weakened areas (Not the aperture for the input unit and chute)
9.2.1c. Complete access – tool attack test (Additional)	Burglary tool attack	Deposit system

Test	Category of attack	Part of attack
10.2 Test conditions for Deposit forcing tool attack test	Destructive attack with the intention to remove several deposits from the receiving unit.	Deposit system (Input unit, chute and pre-existing holes)
10.5 Test conditions for Deposit fishing tool attack test	Manipulative non-destructive attack with the intention to remove several deposits from the receiving unit from the still functioning deposit system.	Deposit system (Input unit, chute and pre-existing holes in receiving unit)
10.6 Test conditions for Deposit retrieval tool attack test	Manipulative non-destructive attack without leaving traces with the intention to remove one deposit from the receiving unit.	Deposit system (Any part)
11.1 Fixing system – tool attack test without force	Burglary tool attack	Receiving unit and base fixing attachments.
11.2 Fixing system – tool attack test with force	Burglary tool attack	Receiving unit and base fixing attachments.

Table 7 — Summary of tests that shall be performed on night safes in all grades

Test	Category of attack	Part to attack
10.7 Test conditions for Last deposit trapping tool attack test	Manipulative attack by means of introduction of devices that prevent one deposit from reaching the receiving unit and then to remove it from the deposit system.	Deposit system (Input unit and chute)
10.8 Test conditions for Deposit repeated trapping tool attack test	Manipulative attack by means of introduction of devices that prevent several deposits from reaching the receiving unit and then to remove them from the still functioning deposit system.	Deposit system (Input unit and chute)

Table 8 — Summary of tests that shall be performed on deposit systems with optional requirement in applicable grades

Test	Category of attack	Part to attack
9.3 Partial access EX – explosive tool attack test	Burglary explosive tool attack	Receiving unit
9.4 Partial access GAS – explosive tool attack test [a)]	Burglary explosive tool attack	Receiving unit
10.3 Test conditions for Deposit forcing EX tool attack test	Destructive attack including plastic explosives with the intention to remove several deposits from the receiving unit.	Deposit system (Input unit and chute) and pre-existing holes
10.4 Test conditions for Deposit forcing GAS tool attack test [a)]	Destructive attack including gas explosives with the intention to remove several deposits from the receiving unit.	Deposit system (Input unit and chute)
a Tests according to 9.4 and 10.4 are normally done on the same test specimen at the same time.		

The structure of the test Clauses 7 to 11 is illustrated in Annex D.

8 Tool attack tests

8.1 General

The test method for tool attack tests is used for testing:

— access tool attack tests, see Clause 9;

— deposit tool attack tests (removal of deposits), see Clause 10;

— fixing system tool attack tests, see Clause 11.

8.2 Principle

The tests serve to establish the lowest grading of the test specimen by finding minimum resistance values for each kind of tool attack test.

If the test specimen includes options, the tests shall be done on the version resulting in the lowest resistance value. Options may be different sizes, locks, chute, single or double door, base for fixing etc. (See also Clause 6.)

A testing team (see 8.3) shall examine the test specimen (see Clause 6) and the technical documentation (see Clause 5) and devise a program of attacking the test specimen. Resistance values for the different kind of tool attack tests (as required in Clause 7) are calculated from the time taken to achieve criteria for fulfilled tool attack test.

The tools and programme of attack used during testing shall be those most likely, in the opinion of the testing team, to result in the lowest resistance values. Exploratory tests may be made.

8.3 Testing team

The testing team shall comprise:

a) a testing team leader, who is responsible for the conduct of the test and whose function is to plan, direct and supervise the testing;

b) a time-keeper whose function is confined to time-keeping and the compiling of the test record;

c) testing operatives whose function is to carry out the necessary tool attacks on the test specimen as directed by the testing team leader.

The test should be carried out according to the current state of the art. In order to ensure consistent test results, testing houses should follow EN ISO/IEC 17025 and participate regularly in audits, co-operative tests, experience-sharing events and other suitable training measures.

8.4 Apparatus

8.4.1 Attack tools

Any tool used for the testing shall be given a coefficient and basic value according to EN 1143-1:2012, Annex A and the additional tool catalogue, Annex C of this European Standard.

Tool category B includes tools of category A.

Tool category C includes tools of categories A and B.

Tool category D includes tools of categories A, B and C.

Tool category S includes tools of categories A, B, C and D.

No alteration to a tool shall be made, other than those permitted in the creation of 'specially made tools'. For instance, it is not permitted to enlarge nozzles, lengthen electrodes, rods or levers etc.

If a hand impact tool and a chisel are used in combination, a specially constructed chisel holder may be used to protect operators. Such a chisel holder shall be regarded as a hand gripping tool (see EN 1143-1:2012, Table A.2).

For some tests, it is allowed to use also other tools and sometimes there are restrictions for use of the listed tools. See respective test in Clauses 9, 10 and 11.

SAFETY WARNING. Tool safety devices such as guards, fuses and other current limiting features and/or maximum speed controls, shall not be removed or altered.

Testing houses should maintain a list of their current tools, together with their category in accordance with EN 1143-1:2012, Annex A.

8.4.2 Clock

The clock shall have an accuracy of at least 0,05 min in each 10 min measuring period, and the scaling shall be at least 0,01 min.

The clocks shall be visible to all observers, and the beginning and end of each operating time shall be indicated by an acoustic or optical signal.

8.5 General test conditions

8.5.1 During any one tool attack test, the following tools shall not be used simultaneously:

a) two or more electrically powered tools (see EN 1143-1:2012, Tables A.7, A.8, A.9 and A.10);

b) two or more thermal tools (see EN 1143-1:2012, Table A.11);

c) two or more hand hammering tools (see EN 1143-1:2012, Table A.5);

d) an electrically powered tool and a thermal tool;

e) a hand hammering tool and an electrically powered tool;

f) a hand hammering tool and a thermal tool;

g) two or more specially made electrically powered tools (see EN 1143-1:2012, Table A.6).

8.5.2 For hand hammering tools used with both hands, the number of blows shall be limited to 250 per tool attack test.

8.5.3 In any one tool attack test only two operatives and the testing team leader shall work on the test specimen. Only two persons are allowed to work on the test specimen at one time.

8.5.4 Balancers shall not be used in a tool attack test.

8.5.5 Dust cleaners and compressed air may be used for cleaning the test specimen.

8.5.6 Testing shall not be directed against areas or features which have been weakened by earlier tests.

8.5.7 Any tool attack test shall be continued until no more information necessary for determining the resistance grade can be reasonably expected. This can occur when the resistance value discovered in previous test attacks is exceeded. An abandoned tool attack test shall count as one of the tests required.

Specific test conditions are to be found for each test; see respective test in Clauses 9, 10 and 11.

8.6 General test procedure

8.6.1 Preparations of final test program

Before the type tests, the following shall be done:

a) Identify the specific tests to be done from the test program (see Clause 7).

b) Examine the test specimen (see Clause 6) and the technical documents (see Clause 5) and ensure that they correlate.

c) Identify weak areas and suitable methods and attack tools to be used for the different tests. If necessary, the testing laboratory may perform exploratory tests to ensure that a representative result will be reached in the tests to be counted (type tests).

d) Define the final test program including each tool attack test.

The considerations done by the testing laboratory in order to find the area to attack, the methods and attack tools shall be kept in the test documentation of the laboratory. Deviations from the final test program shall be recorded and an explanation of the change shall be given.

8.6.2 Attack tools for each test

For each test, the attack tools shall be prepared so that they are ready for immediate use. Set-up times for first assembly are included in the basic values and shall not be additionally added for the determination of the resistance value. For example, power drills shall be fitted with a drill bit, angle grinders fitted with a cutting disc, thermal tools fitted with the appropriate nozzles, and drill stands attached to the sample.

8.6.3 Status and position of the test specimen

The status of the test specimen shall be in its normal attitude on the floor or on a simulated floor, and may be fixed, if necessary, to assist testing all in accordance with the conditions for each test; see Clauses 9, 10 and 11.

The position of the deposit system shall also be in accordance with the conditions for each test; see Clauses 9, 10 and 11.

For tool attack testing, the deposit system test specimen need not be anchored except for Fixing system – tool attack test with force; see 11.2.

Commence the relevant tool attack test, in accordance with the relevant test conditions; see Clauses 9, 10 and 11, measuring the time in accordance with 8.7.

8.6.4 Measurement of operating time

The operating time for each operation shall be measured and recorded.

a) For operations with tools, start the clock as the tool touches the test specimen and stop the clock when the tool ceases to touch the test specimen.

b) For operations when no tool or device is used, start the clock as the testing operative touches the test specimen and stop the clock when the testing operative ceases to touch the test specimen.

The operating time recorded shall be rounded to the next complete 1/60 min or 1/100 min.

If hand hammering tools (see EN 1143-1:2012, Table A.5) are used with both hands, the operating time shall be calculated from the number of blows in accordance with the following:

— Tools of category A: 1/60 min per blow, when the tool impacts directly against the test specimen;

1/40 min per blow when accessories (see EN 1143-1:2012, Table A.12) transmit the impact force to the test specimen.

— Tools of category B: 1/30 min per blow when the tool impacts directly against the test specimen;

1/15 min per blow when accessories (see EN 1143-1:2012, Table A.12) transmit the impact force to the test specimen.

If an attack simultaneously uses a two-handed impact method, where the time is calculated from the number of blows, and another mechanical attack method, e.g. using a crowbar, then the time taken shall be the longer of the two times, i.e. either the actual operating time, or the operating time calculated from the number of blows.

Operating time includes any time taken to extract tools (or parts of tools) whose removal is necessary to continue the test. The operating time also includes any time for repositioning the test specimen during a tool attack test.

The operating time includes any short period(s) during which a tool is removed from contact with the test specimen if this is necessary for the most effective continuation of the test attack; for example, when an electric hammer is removed from contact so that the point or angle of attack can be changed.

The operating time does not include:

c) the time taken to relocate the position of a tool stand, or remove it;

d) the duration of a temporary interruption of a tool attack test, ordered by the testing team leader on the grounds of safety, e.g. due to the emission from the test specimen of excessive gas, smoke or soot, or for cleaning or removing debris from the work area;

e) any time that the testing team leader authorizes for inspection/checks of the test specimen;

f) the time during which non-tools (see EN 1143-1:2012, Table A.14) and the dust cleaner or compressed air for cleaning are used;

g) any time for checking if a criteria for fulfilled tool attack has been achieved.

8.7 Calculation of resistance values

For each tool attack test, calculate the resistance values V_R from the following:

$$V_R = \sum t \times C + \sum BV$$

where

$\sum t$ is the sum of all operating times, in minutes.

In all tool attack tests $\sum t$ is the sum of all operating times, in minutes. For EX or GAS post-detonation work after the detonation.

In Fixing system - tool attack test with force, post-force work $\sum t$ is the sum of all operating times, in minutes after the force has been released.

C is the highest tool coefficient of the attack tools used (see EN 1143–1:2012, Annex A).

In all tool attack tests, C is the highest tool coefficient of the attack tools used. For EX or GAS post-detonation work after the detonation.

In Fixing system - tool attack test with force, post-force work, C is the highest tool coefficient of the attack tools used after the force has been released.

$\sum BV$ is the sum of the basic values for all attack tools used.

In all tool attack tests $\sum BV$ is the sum of the basic values for all attack tools used. For EX or GAS post-detonation work after the detonation.

In Fixing system - tool attack test with force, post-force work, $\sum BV$ is the sum of the basic values for all attack tools used after the force has been released.

The calculated value shall be rounded-up to the next whole number. This number is the resistance value in resistance units (RU) for that tool attack test.

8.8 Test record – tool attack tests

In addition to the requirement for reporting test results in EN ISO/IEC 17025, the test records for each tool attack test shall record at least the following information:

— composition of testing team, indicating who was the team leader, the time-keeper and who were the testing operatives;

— names of testing observers, if any;

— type of product;

— identification of test specimen (see Clause 6);

— the final test program including each tool attack test;

— description of each tool attack test made, in chronological order, giving details of the point of attack, attack tools, measurements made and events, together with a record of all operating times and reference to any photographic or video records made;

— test criteria (conditions) and test block used for the tests (only for access tests);

— status of the deposit system (traces, damage and function) before and after each deposit tool attack test. (only for deposit tool attack tests);

— status (damages) of deposits before each deposit tool attack test and of removed deposits. (only for deposit tool attack tests);

— calculation of the resistance value V_R in resistance units (RU);

— for testing including explosives a description and calculation of post detonation tool attack test resistance value.

If test was stopped before criteria for fulfilled attack was reached, an explanation shall be given. The status of the test specimen shall be recorded.

9 Access tool attack tests

NOTE Access tool attack tests are:

— Partial access – tool attack test (9.1)

— Complete access – tool attack test (9.2)

— Partial access – EX and tool attack test (9.3)

— Partial access – GAS and tool attack test (9.4)

9.1 Partial access – tool attack test

9.1.1 General

a) Partial access – tool attack test shall be done against the body or the door of the receiving unit.

b) Additional partial access – tool attack tests shall be done against the body or the door of the receiving unit if there are areas or zones of different construction or holes and for which the resistance value can be reasonably expected to be lower.

Any holes other than the aperture for the input unit or chute and other than those through the floor of a receiving unit that are provided for anchoring may be exploited in the tests.

The test specimen may be toppled so that the bottom can be attacked for partial access. The time taken to do this shall be counted as operating time.

The lowest resistance value achieved in partial access – tool attack tests of the receiving unit and the deposit system shall apply.

9.1.2 Test blocks to measure partial access

Three test blocks of rigid material are required, each with a length of 150 mm and the following cross-sections:

a) A circle with 125 mm diameter;

b) a square with 112 mm side length; edges and corners rounded with r = 5 mm;

c) a rectangle with 100 mm × 125 mm side length; edges and corners rounded with r = 5 mm.

For all dimensions the tolerance shall be $^{+2}_{0}$ mm.

9.1.3 Test criteria

The tool attack test for partial access is completed when one of the test blocks specified in 9.1.2 can pass completely through the aperture created.

9.2 Complete access – tool attack test

9.2.1 General

a) Complete access – tool attack test shall be done against the body or the door (including the bolt work) of the receiving unit.

b) Additional complete access – tool attack tests shall be done against the body or the door (including the bolt work) of the receiving unit if there are areas or zones of different construction or holes and for which the resistance value can be reasonably expected to be lower.

   Any holes other than the aperture for the input unit or chute and other than those holes that are provided for anchoring may be exploited in the tests.

c) Additional complete access – tool access tests of the deposit system shall be done if this is expected to result in a lower resistance value than that achieved in complete access – tool attack test of the receiving unit without input unit or chute attached.

The test specimen may be toppled so that the bottom can be attacked for complete access. The time taken to do this shall be counted as operating time.

The lowest resistance value achieved in complete access – tool attack tests of the receiving unit and the deposit system shall apply.

9.2.2 Test blocks to measure complete access

Three test blocks of rigid material are required, each with a length of 400 mm and the following cross-sections:

a) a circle with 350 mm diameter;

b) a square with 315 mm side length; corners rounded with r = 10 mm;

c) a rectangle with 300 mm × 330 mm side length; edges and corners rounded with r = 10 mm.

For all dimensions, the tolerance shall be $^{+3}_{0}$ mm.

9.2.3 Test criteria

The tool attack test for complete access is completed when one of the following conditions is met:

— one of the test blocks specified in 9.2.2 can pass through the aperture created; or

— the door is removed, or the door is opened to a clear width of at least 300 mm over at least 80 % of the inside height of the door opening in the receiving unit; or

— the removal from the encasement (for built-in receiving units/deposit system).

9.3 Partial access EX – explosive tool attack test

9.3.1 Principle

A charge of plastic explosives is detonated inside the receiving unit. A partial access - tool attack test is then made to measure the remaining resistance to obtaining partial access (post-detonation resistance value) as defined in 9.1.

9.3.2 Test specimen

The test specimen shall be an undamaged empty receiving unit and of the same design including apertures as used in the tool attack test. A test specimen which has previously been subjected to the tool attack tests may be used if that test will not influence the result of the partial access EX - explosive tool attack test.

If the input unit or chute is outside the receiving unit then they need not to be parts of the test specimen. Instead the aperture for the input unit or chute shall be blocked on the inside with a 10 mm steel plate.

If the input unit or chute or part of them is inside the receiving unit, the test specimen shall include them in partial access EX - explosive tool attack test. Parts in or for the deposit system not influencing the result may be removed before testing.

9.3.3 Explosives

The plastic explosives shall be of pentaerythritol tetranitrate (PETN) with the following properties:

— density (1 500 ± 50) kg/m^3;

— specific energy (5 000 ± 500) J/g; and

— detonation velocity (7 000 ± 500) m/s.

9.3.4 Plastic explosive charge mass

The mass of the explosive charge shall conform to Table 9.

Table 9 — Mass of plastic explosive charge

Grade		Plastic explosive charge mass (g)
D-II EX, D-III EX and D-IV EX	N-II EX, N-III EX and N-IV EX	70 ± 1
D-V EX	N-V EX, N-VI EX and N-VII EX	100 ± 1
–-	N-VIII EX, N-IX EX and N-X EX	200 ± 1

9.3.5 Test criteria

The partial access EX – explosive tool attack test is completed when partial access is achieved (see 9.1.2 and 9.1.3).

9.3.6 Attack tool restrictions for post-detonation tool attack

For post-detonation tool attack, only attack tools of categories A, B, C and D may be used.

9.3.7 Elements to be attacked

Post-detonation tool attack test is not allowed on the receiving unit aperture for input unit or chute.

9.3.8 Test procedure

The explosive charge is made into a compact shape and positioned at the geometric centre of the interior space of the receiving unit. Close and lock the door, and detonate the charge.

After detonation, perform a tool attack until partial access (as defined in 9.1.3), or the required post-detonation resistance value (see Table 2 / Table 3) has been achieved. Record the tool attack as post-detonation tool attack.

The post-detonation tool attack shall be continued until no more information necessary for determining the post-detonation resistance value can be reasonably expected.

9.3.9 Test record

In addition to the information in 8.8, the following shall be recorded:

— trade mark of the explosives and the mass of the explosives;

— description of the location of the charge;

— status of the test specimen before starting the post-detonation tool attack test.

9.4 Partial access GAS – explosive tool attack test

9.4.1 Principle

A charge of explosive gas is detonated inside the receiving unit. A partial access - tool attack test is then made to measure the remaining resistance to obtaining partial access (post-detonation resistance value) as defined in 9.1.

The partial access GAS – explosive tool attack test and the deposit forcing GAS tool attack test (see 10.4) are the same until the charge has detonated. The same test specimen may be used for the continuation of the two tests.

9.4.2 Test specimen

The test specimen shall be an undamaged empty receiving unit and of the same design including apertures as used in the tool attack test (no deposits inside when detonating the gas). A test specimen which has previously been subjected to tests may be used if that test will not influence the result of the partial access GAS - explosive tool attack test.

9.4.3 Explosives

The gas explosives shall be a stoichiometric and homogeneous mixture of 1 part acetylene (C_2H_2) and 2,5 parts oxygen (O_2).

— the gas component purity shall be > 99,0 %;

— the C_2H_2 and O_2 volumes shall be corrected to conditions of 20 °C and 1 013 hPa.

NOTE To obtain a homogeneous gas charge, the mixing of the gas components can either be done before (e.g. mixing by devices such as a nozzle) or after (e.g. mixing by a circulation pump) filling into the flexible container(s).

9.4.4 Explosive charge volume

The volume of explosive gas V_{Charge} shall be calculated from the volume of internal space $V_{\text{internal space}}$ using the following formula:

V_{Charge} = 50 l < 50 % $V_{\text{internal space}}$ < 100 l

The calculated volume shall be rounded-up to the next full number.

9.4.5 Test equipment

— Measuring equipment for gas volume shall verify a volume with a tolerance of ± 5 %.

— Flexible container(s) (for the storage of the explosive gas) with back pressure < 1 hPa and no absorption of energy.

The properties of the flexible container(s) in respect to the dimensions, material and stability shall be chosen so that these will not influence the results of the test.

9.4.6 Test criteria

The test criteria for partial access GAS - explosive tool attack test is when partial access is achieved (see 9.1.2 and 9.1.3).

9.4.7 Attack tool restrictions for post-detonation tool attack

For post-detonation tool attack, only attack tools of categories A, B, C and D may be used.

9.4.8 Test procedure

— Position the ignition device and the flexible container (s) for the explosive gas charge near the middle of the internal space of the receiving unit.

— Fill the gas charge container(s) with air or inert gas to check it for leakage and position.

— Empty the gas charge container(s).

— Close and lock the door.

— Fill the flexible container(s) with the explosive gas charge.

— Ignite the charge.

After detonation, perform a tool attack test until partial access (as defined in 9.1.3), or the required post-detonation resistance value (see Table 2 / Table 3) has been achieved.

The post-detonation tool attack shall be continued until no more information necessary for determining the post-detonation resistance value can be reasonably expected.

Record the tool attack as post-detonation tool attack.

9.4.9 Test record

In addition to the information in 8.8 the following shall be recorded:

— a type of flexible container;

— a description of the location of the flexible container;

— the volume of the GAS explosives;

— the status of the test specimen before starting the post-detonation tool attack test.

10 Deposit tool attack tests (removal of deposits)

NOTE Deposit tool attack tests are:

— Deposit forcing tool attack test (10.2)

— Deposit forcing EX tool attack test (10.3)

— Deposit forcing GAS tool attack test (10.4)

— Deposit fishing tool attack test (10.5)

— Deposit retrieval tool attack test (10.6)

— Last deposit trapping tool attack test (10.7)

— Deposit repeated trapping tool attack test (10.8)

10.1 General for all deposit tool attack tests

10.1.1 Purpose and general

The purpose with deposit tool attack tests is to determine the resistance of removal of one or several deposits from the deposit system under different conditions.

The deposit tool attack test shall include:

— the worst case of combination of bases and deposit system;

— attempts to influence the depositing procedure via the sensors of the controlling system (if present) or by mechanical obstruction of the input mechanism;

— attempts to operate the system by direct connection of external voltages to the system actuators (if present);

— influence of the interruption of the power supply during the test.

The deposit tool attack test shall not include:

— the toppling of the deposit system;

— exchange or manipulation of the control programmes;

— attempts to influence the controller (if present) by electromagnetic radiation or electrostatic shock, or attempts to rearrange connections on PC boards or relays.

10.1.2 Attack tool restrictions and additions

Tools of categories A, B, C and D and non-tools as defined in EN 1143-1 shall be used. In addition, tools specified in Annex C of this European Standard may be used.

The key or code to the input unit is considered to be an attack tool with basic value 0 RU and tool co-efficient 5 RU/min.

10.1.3 Preparations of the deposit system before testing

Place the deposit system in the normal operating position (see 8.6.3).

Load the receiving unit with deposits to 75 % of the design capacity or simulate this if it does not influence the result of the test. For deposit forcing GAS tool attack test (10.4) loading with deposits is done after the detonation.

The type of deposit shall be that which the deposit system is intended to process. If more than one type of deposits is intended to be processed, testing shall be done with the type which is expected to result in the lowest resistance value. If special deposits are not specified, bank notes in envelopes shall be used.

Check that the deposit system operates properly.

— Close and lock (if possible) the input unit of the deposit system and place the input unit in the position before the deposit sequence starts (see also respective test-conditions).

Evidence of preparatory work shall be taken into account when assessing whether traces of attack are visible. Preparatory work shall not be hidden or disguised before a photo is taken to decide whether traces of the attack are visible.

10.1.4 Test conditions

For deposit systems where the input unit has unclassified locks (not EN 1300 classified) the code or key shall be available for the testing team in all deposit tool attack tests. If the lock is classified (EN 1300) then see the condition for each deposit tool attack test.

The input unit may under operating time be moved to another position in the deposit sequence from where the test continues.

The criteria for the completion of the various deposit tool attack tests is the removal of undamaged deposit(s) as stated in respective test-conditions.

A deposit is considered to be undamaged if the value of the deposit or its contents is not reduced.

The time for inserting deposits is not operating time.

Time for cooling or for glue to harden shall not be included in the operating time.

10.1.5 Criteria for fulfilled test and status of deposits

The test shall continue until the number (stated in respective test-conditions) undamaged deposits have been removed but can be stopped before if the required value is fulfilled (see 8.5.7). If a deposit is damaged this will not be counted, but the operating time for removing it will be counted.

10.2 Test conditions for Deposit forcing tool attack test

10.2.1 Code or key to the input unit

For unclassified (EN 1300) locks: see 10.1.4.

For classified (EN 1300) locks:

— Night safes: The code or key shall be available for the testing team.

— Deposit safes: The code or key shall not be available for the testing team.

10.2.2 Place from where deposits shall be removed

Deposits shall be removed from the receiving unit.

10.2.3 Elements to be attacked

Deposit forcing tool attack test are allowed on the input unit, chute and pre-existing holes in receiving unit which may be enlarged.

10.2.4 Way out for the deposits

The deposits shall pass through the input unit, chute or other pre-existing holes in the receiving unit.

10.2.5 Damages, changes, traces

Forcing may cause visible damages, changes and malfunctions of the deposit system.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by the human naked eye.

10.2.6 Criteria for fulfilled test, number of removed deposits

Three undamaged deposits are removed from the deposit system.

10.3 Test conditions for Deposit forcing EX tool attack test

10.3.1 Principal

Place a plastic explosive charge in the input unit or chute, detonate it and then measure the remaining resistance value (RU) by a tool attack test to remove three undamaged deposits from the deposit system.

10.3.2 Code or key to the input unit

For unclassified (EN 1300) locks: see 10.1.4.

For classified (EN 1300) locks:

— Night safes: The code or key shall be available for the testing team.

— Deposit safes:

  — When placing and tamping the plastic explosive charge the code or key shall be available for the testing team.

  — When making post–detonation tool attack the code or key shall not be available for the testing team.

10.3.3 Explosives and charge mass

See 9.3.3 and 9.3.4.

10.3.4 Place from where deposits shall be removed

Deposits shall be removed from the receiving unit.

10.3.5 Placing and tamping the plastic explosive charge

The charge shall be placed in the input unit or in the chute. The charge shall not be placed inside the receiving unit indicated by $V_{internal\ space}$ in Figure A.1.

It shall be demonstrated that it is possible to place and tamp the explosive charge at the spot as intended when the design and function of the input unit is taken into consideration. If a specific position of the input unit mechanism is necessary for the intended placing of the charge, it shall be demonstrated that the function of the input unit does not prevent the mechanism from being brought into that position.

Before the detonation, the input unit may be opened by using the key or code (if allowed, see 10.3.2) and the explosive charge positioned where it is deemed to result in the lowest remaining resistance value. Then the input unit shall be closed and locked if lockable.

10.3.6 Post-detonation tool attack (remaining resistance value)

10.3.6.1 Operation time for Post-detonation tool attack

The operation time for Post-detonation tool attack starts when the first attack tool touches the test specimen after the explosion. The test shall be continued until no more information necessary for determining the post-detonation resistance value can be reasonably expected.

10.3.6.2 Elements to be attacked during post-detonation tool attack

During post-detonation tool attack the input unit, chute and pre-existing holes in receiving unit may be attacked.

10.3.6.3 Way out for the deposits

The deposits shall pass through the input unit, chute or other pre-existing holes in the receiving unit.

10.3.6.4 Damages, changes, traces

Deposit forcing EX tool attack test may cause visible damages, changes and malfunctions of the deposit system.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by human naked eye.

10.3.6.5 Criteria for fulfilled test, number of deposits

Three undamaged deposits are removed from the deposit system.

10.3.7 Test record

In addition to the information in 8.8 the following shall be recorded:

— trade mark of the explosives and the mass of the explosives;

— a description of the location of the charge;

— the status of the test specimen before starting the post-detonation tool attack test.

10.4 Test conditions for Deposit forcing GAS tool attack test

10.4.1 Principal

A charge of explosive gas is detonated inside the receiving unit. A deposit forcing - tool attack test is then made to measure the remaining resistance value (RU) to remove three undamaged deposits from the deposit system.

The deposit forcing GAS tool attack test and the partial access GAS – explosive tool attack test (see 9.4) are the same until the charge has detonated. The same test specimen may be used for the continuation of the two tests.

10.4.2 Code or key to the input unit

For unclassified (EN 1300) locks: see 10.1.4.

For classified (EN 1300) locks:

— Night safes: The code or key shall be available for the testing team.

— Deposit safes: When making post–detonation tool attack the code or key shall not be available for the testing team.

10.4.3 Explosives

See 9.4.3

10.4.4 Explosive charge volume

See 9.4.4

10.4.5 Place from where deposits shall be removed

Deposits shall be removed from the receiving unit.

10.4.6 Test procedure

There shall be no deposits inside the receiving unit when the charge of explosive gas is detonated.

Before the detonation, the input unit may be opened by using the key or code (if allowed see 10.4.2) and then positioned where it is deemed to result in the lowest remaining resistance value.

— Position the ignition device and the flexible container(s) for the explosive gas charge near the middle of the internal space of the receiving unit.

— Fill the gas charge container(s) with air or inert gas to check it for leakage and position.

— Empty the gas charge container(s).

— Close and lock the door.

— Fill the flexible container (s) with the explosive gas charge.

— Ignite the charge.

10.4.7 Post-detonation tool attack (remaining resistance value)

10.4.7.1 General

If needed to measure the remaining resistance value deposits shall be inserted maximum up to 75 % of the design capacity. This shall not be done through the input unit or chute.

A tool attack test is done until three deposits have been removed from the receiving unit. Record the tool attack as post-detonation tool attack.

10.4.7.2 Operation time for Post-detonation tool attack

The operation time for post-detonation tool attack starts when the first attack tool touches the test specimen after the explosion. The test shall be continued until no more information necessary for determining the post-detonation resistance value can be reasonably expected.

10.4.7.3 Elements to be attacked during post-detonation tool attack

During post-detonation tool attack, the input unit and chute may be attacked.

10.4.7.4 Way out for the deposits

The deposits shall pass through the input unit or chute.

10.4.7.5 Damages, changes, traces

Deposit forcing GAS tool attack test may cause visible damages, changes and malfunctions of the deposit system.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by human naked eye.

10.4.7.6 Criteria for fulfilled test, number of deposits

Three undamaged deposits can be removed from the deposit system.

10.4.8 Test record

In addition to the information in 8.8 the following shall be recorded:

— Type of flexible container;

— A description of the location of the flexible container;

— The volume of the GAS explosives;

— The status of the test specimen before starting the post-detonation tool attack test.

10.5 Test conditions for Deposit fishing tool attack test

10.5.1 Code or key to the input unit

For unclassified (EN 1300) locks: See 10.1.4.

For classified (EN 1300) locks: The code or key shall be available for the testing team.

10.5.2 Place from where deposits shall be removed

Deposits shall be removed from the receiving unit.

10.5.3 Elements to be attacked

Deposit fishing tool attack test are allowed on the input unit and chute and pre-existing holes in receiving unit.

10.5.4 Way out for the deposits

The deposits shall pass through pre-existing holes in the receiving unit. They need not to pass through the chute and the input unit.

10.5.5 Damages, changes, traces

Fishing is not intended to cause damage to the deposit system.

Visible traces are allowed.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by human naked eye.

10.5.6 Criteria for fulfilled test, number of deposits

Three undamaged deposits.

10.6 Test conditions for Deposit retrieval tool attack test

10.6.1 Code or key to the input unit

For unclassified (EN 1300) locks: See 10.1.4.

For classified (EN 1300) locks: The code or key shall be available for the testing team.

10.6.2 Place from where deposit shall be removed

Deposit shall be removed from the receiving unit.

10.6.3 Elements to be attacked

Deposit retrieval tool attack tests are allowed at any part of the deposit system.

10.6.4 Way out for the deposit

The deposit shall pass through pre-existing holes in the receiving unit including the gap between the door and the frame.

10.6.5 Damages, changes, traces

The deposit retrieval tool attack test shall not leave traces in the deposit system visible in examination by experts.

10.6.6 Criteria for fulfilled test, number of deposits

One undamaged deposit.

10.7 Test conditions for Last deposit trapping tool attack test

10.7.1 Code or key to the input unit

For unclassified (EN 1300) locks: See 10.1.4.

For classified (EN 1300) locks: The code or key shall be available for the testing team.

10.7.2 Additional attack tools, devices

Devices of any design, which are not included in the tool list of EN 1143-1, may be used in last deposit trapping attack test. Such devices are treated as if they were specially made tools of tool category A of EN 1143-1:2012, Table A.6, with a tool coefficient of 5 RU/min and a basic value of 18 RU. When calculating the contribution of such devices to the resistance value, the time for fitting the device to the deposit system, multiplied by the tool coefficient and the basic value of the device, shall be counted. If tools of a higher category than category A are used for fitting the device to the deposit system, the higher tool coefficient shall apply and the relevant basic value(s) shall be included.

The basic units are calculated per every separate device.

10.7.3 Interruptions for depositing

The test includes operation time for preparations of the input unit and chute to prevent deposits to enter into the receiving unit. The preparations shall not cause obvious visible damages or mal-functions for the depositor. The time for depositing shall not be counted as operation time.

10.7.4 Place from where the deposit shall be removed

The deposit shall be removed from anywhere in the deposit system.

10.7.5 Elements to be attacked

Last deposit trapping tool attack tests are allowed on the input unit and chute.

10.7.6 Way out for the deposit

The deposit shall pass through the input unit or chute.

10.7.7 Damages, changes, traces

The last deposit tool attack test may cause damage and or leave traces visible to the depositor.

The deposit system may be inoperative after fulfilled test.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by human naked eye.

10.7.8 Criteria for fulfilled test, number of deposits

One undamaged deposit.

10.8 Test conditions for Deposit repeated trapping tool attack test

10.8.1 Code or key to the input unit

For unclassified (EN 1300) locks: See 10.1.4.

For classified (EN 1300) locks: The code or key shall be available for the testing team.

10.8.2 Additional attack tools, devices

Devices of any design, which are not included in the tool list of EN 1143-1, may be used in repeated trapping attack test. Such devices are treated as if they were specially made tools of tool category A of EN 1143-1:2012, Table A.6, with a tool coefficient of 5 RU/min and a basic value of 18 RU. When calculating the contribution of such devices to the resistance value, the time for fitting the device to the deposit system, multiplied by the tool coefficient and the basic value of the device, shall be counted. If tools of a higher category than category A are used for fitting the device to the deposit system, the higher tool coefficient shall apply and the relevant basic value(s) shall be included.

The basic units are calculated per every separate device.

10.8.3 Interruptions for depositing

The test includes operation time for preparations of the input unit and chute to prevent deposits to enter into the receiving unit. The preparations shall not cause obvious visible damages or mal-functions for the depositor. The time for depositing shall not be counted as operation time.

10.8.4 Place from where deposits shall be removed

Deposits shall be removed from anywhere in the deposit system.

10.8.5 Elements to be attacked

Deposit repeated trapping tool attack tests are allowed on the input unit and chute.

10.8.6 Way out for the deposits

The deposits shall pass through the input unit or chute.

10.8.7 Damages, changes, traces

Deposit repeated trapping tool attack tests shall not leave traces visible to the depositor and the system shall work after removal of deposits.

Visible traces and visible damage: Scratches or changes resulting from the action of tools, that can be detected from 1 m away from the trace/damage by human naked eye.

10.8.8 Criteria for fulfilled test, number deposits

Three undamaged deposits.

11 Fixing system tool attack tests

NOTE Fixing system tool attack tests are:

— Fixing system - tool attack test without force (11.1);

— Fixing system - tool attack test with force (11.2).

11.1 Fixing system – tool attack test without force

11.1.1 Principle

The resistance value of receiving unit fixing system is assessed by applying a tool attack test on the fixing attachments.

11.1.2 Test specimen

The test specimen shall be an undamaged empty receiving unit and of the same design including apertures as used in the tool attack test. A test specimen which has previously been subjected to other tests may be used if these tests will not influence the result of the fixing system tool attack test.

If the deposit system includes a base as an option (see technical documentation) the fixing system will be tested for the alternative (with or without the base) deemed to result in the lowest resistance value.

11.1.3 Equipment

The following equipments shall be used:

— Steel plate to which the test specimen (receiving unit or the receiving unit base) shall be anchored.

11.1.4 Elements to be attacked

Fixing attachments of the receiving unit and the receiving unit base (if any) may be attacked through the receiving unit base or through holes pre-existing in the receiving unit if the holes are within 250 mm of the bolt being attacked.

NOTE Receiving unit fixing attachments and the base fixing attachments and the base itself can be attacked.

11.1.5 Test criteria

Fixing system - tool attack test without force is completed when the fixing attachments are completely severed.

NOTE Receiving unit fixing attachments or the base fixing attachments or the base itself can be severed.

11.1.6 Preparation

The test specimen shall be fixed to the steel plate by using the anchoring method according to manufacturer's instructions.

If the receiving unit has no base, fix the receiving unit to the steel plate using the anchoring method which the manufacturer recommends. If the receiving unit has a base, attach the base to the steel plate using the anchoring method which the manufacturer recommends and fix the receiving unit attached to the base using the anchoring method which the manufacturer recommends.

For a wall-mounted receiving unit, turn the receiving unit through 90° and attach it to the horizontal steel plate so that the steel fixing plate simulates the vertical mounting wall.

New fixing bolts and associated items shall be used for each test.

The test shall be carried out with the receiving unit closed and locked.

11.1.7 Attack tool restrictions

Only tools of categories A, B, C and D (except those listed in EN 1143-1:2012, Table A.6) may be used. Non-tools listed in EN 1143-1:2012, Table A.14 shall not be used.

11.1.8 Test record

Information as described in 8.8 shall be recorded.

11.2 Fixing system – tool attack test with force

11.2.1 Principle

The resistance value of receiving unit fixing system is assessed by applying a force and then carrying out a tool attack test on the fixing attachments with the following steps:

a) An attempt shall be made to remove or weaken any external fixings.

b) A force shall be applied to the receiving unit.

c) A tool attack test shall be made on the fixing attachments.

11.2.2 Test specimen

The test specimen shall be an undamaged empty receiving unit and of the same design including apertures as used in the tool attack test. A test specimen which has previously been subjected to other tests may be used if these tests will not influence the result of the fixing system tool attack test.

If the deposit system includes a base as an option (see technical documentation) the fixing system will be tested for the alternative (with or without the base) deemed to result in the lowest resistance value.

11.2.3 Equipment

The following equipment shall be used:

— Means for applying a horizontal force of at least 100 kN to the sample, and which is able to measure the applied force with an accuracy of within ± 5 %.

— Steel plate to which the test specimen (receiving unit or the receiving unit base) shall be anchored, and which is capable of withstanding the full test force.

11.2.4 Attack tool restrictions

Only tools of categories A, B, C and D (except those listed in EN 1143-1:2012, Table A.6) may be used. Non-tools listed in EN 1143-1:2012, Table A.14 shall not be used.

11.2.5 Test criteria

The fixing system - tool attack test with force is completed when the fixing attachments for the receiving unit with or without its base is completely severed from the steel plate.

NOTE The receiving unit fixing attachments to the base or to the steel plate or the base fixing attachments to the steel plate can be severed.

11.2.6 Preparation

The test specimen shall be fixed to the steel plate by using the anchoring method according to manufacturer's instructions.

If the receiving unit has no base, fix the receiving unit to the steel plate using the anchoring method which the manufacturer recommends. If the receiving unit has a base, attach the base to the steel plate using the anchoring method which the manufacturer recommends and fix the receiving unit attached to the base using the anchoring method which the manufacturer recommends.

For a wall-mounted receiving unit, turn the receiving unit through 90° and attach it to the horizontal steel plate so that the steel fixing plate simulates the vertical mounting wall.

New fixing bolts and associated items shall be used for each test.

Components may be added to the receiving unit to facilitate the application of the required test force; for instance by welding either a steel bar to the receiving unit, against which a jack can be applied, or an attachment on which to pull.

The test shall be carried out with the receiving unit closed and locked.

11.2.7 Test procedure

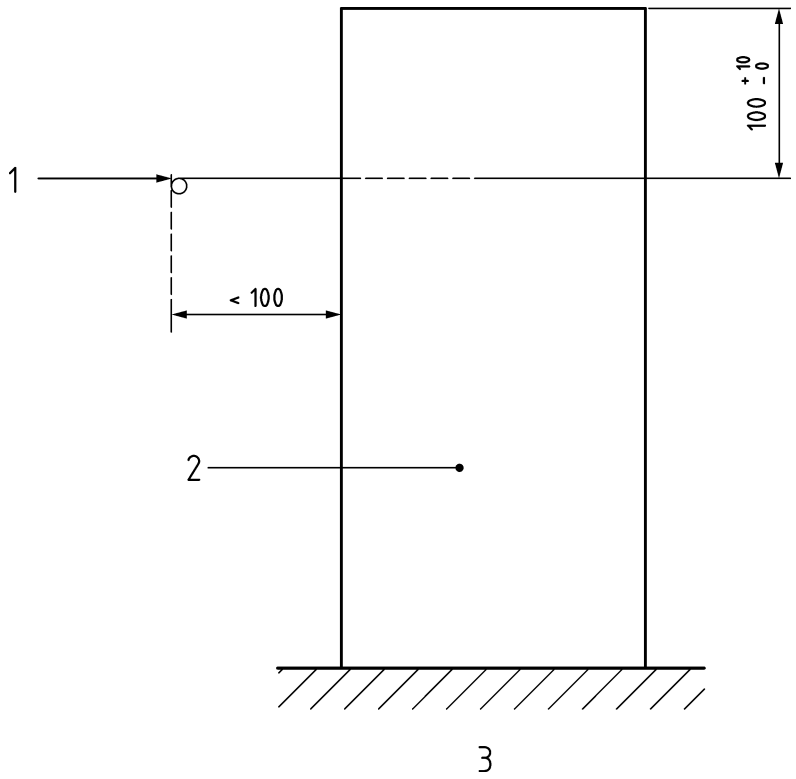
11.2.7.1 Removing or weakening of external fixings

Before the force is applied, an attempt shall be made to remove or weaken any external fixings. This shall be done using category A hand (dis)assembling tools (see EN 1143-1:2012, Table A.1) for a maximum of 50 resistance units (RU).

11.2.7.2 Force

The force (maximum 50 kN for resistance grades D-0 to D-III and N-II to N-III. Maximum 100 kN for resistance grades D-IV to D-V and N-IV to N-X) shall be applied horizontally at the start of the test. For floor-mounted receiving units the force shall be applied $\left(100\ ^{+10}_{-0}\right)$ mm below the top of the receiving unit. For wall-mounted receiving units, the force shall be applied $\left(100\ ^{+10}_{-0}\right)$ mm below the highest point of the receiving unit when mounted according to 11.2.6 (See also Figure 1).

Dimensions in millimetres



Key

1 force

2 test specimen

3 steel plate

Figure 1 — Testing arrangements for applying the force

If during the test the angle from horizontal of the applied force exceeds ± 15°, the fixed mounted point of the load mechanism shall be repositioned to restore the horizontal force. The force shall, after the repositioning, be applied in the same horizontal direction.

The force shall be applied smoothly with a speed attained within 2 min to 3 min to reach the maximum allowed force. Applying the force may be stopped at any position where the following tool attack test is deemed to result in the lowest resistance value. The applied force shall be maintained for one minute and then released.

Wedges or other devices can be placed within gaps created by the applied force before repositioning of the force mechanism and before releasing the force if this is expected to result in a lower resistance value in the following tool attack test.

For receiving units with a base the force applied will be in a pushing direction and will continue to be pushed from the initially applied point while the test specimen tilts and effectively changes the height of the force application relative to the base of the test equipment (the steel plate in Figure 1). Pulling equipment may alternatively be used, but additional test equipment (such as welded-on or clamped brackets) shall be utilized for such pulling equipment so that the application of the force is compressive onto the test specimen.

11.2.7.3 Tool attack test on the fixing attachments

A tool attack test is carried out to completely sever the receiving unit (with or without its base) from the anchoring test equipment (the steel plate in Figure 1) by cutting or destroying the fixing attachments, which can be attacked through the receiving unit base, or between any gaps created by the force. Attacks to open the receiving unit door to gain access to the anchoring bolts are not allowed.

11.2.8 Test record

In addition to the information in 8.8 the following shall be recorded:

— result of removal or weakening the external fittings;

— position and direction of the applied force; repositioning of the force if any;

— maximum of applied force;

— position of the test specimen when starting the tool attack test on the fixing attachment.

12 Test report and test records

12.1 Test report

The test report may be designed in different ways. It can be a summary document with references to test records for performed tests or with the test records implemented in the test report.

The test report together with the test records shall comply with the requirements in EN ISO/IEC 17025 with the additions as below:

a) technical documentation supplied in accordance with Clause 5 and in case of a built-in receiving unit or cast *in situ* receiving unit the quality of the encasement work done at the test site;

b) description and result of any exploratory tests made;

c) final testing programme developed on the basis of the initial examination and exploratory tests;

d) date and place for all tests;

e) composition of the testing team, the names of the testing team leader, the time keeper and the testing operatives; names of any independent technical experts consulted;

f) results from all tests.

12.2 Test records

All test records shall contain necessary information for identifying the test method and the test specimen.

Test record for every performed test shall contain necessary information so the test in detail can be repeated,

Details to record for the different test methods are listed in the clause for the method.

13 Marking

Deposit systems shall be clearly and indelibly marked, on a fixed metal plate on the inside of the door or within the locking chamber, with at least the following:

a) manufacturer's name or identification code;

b) standard designation;

c) classification with resistance grade and options (EX and/or GAS);

d) type of product: deposit safe (D) or night safe (N);

e) year of manufacture.

Additional marking may comprise:

f) model number and description or size and the weight of the product;

g) serial number.

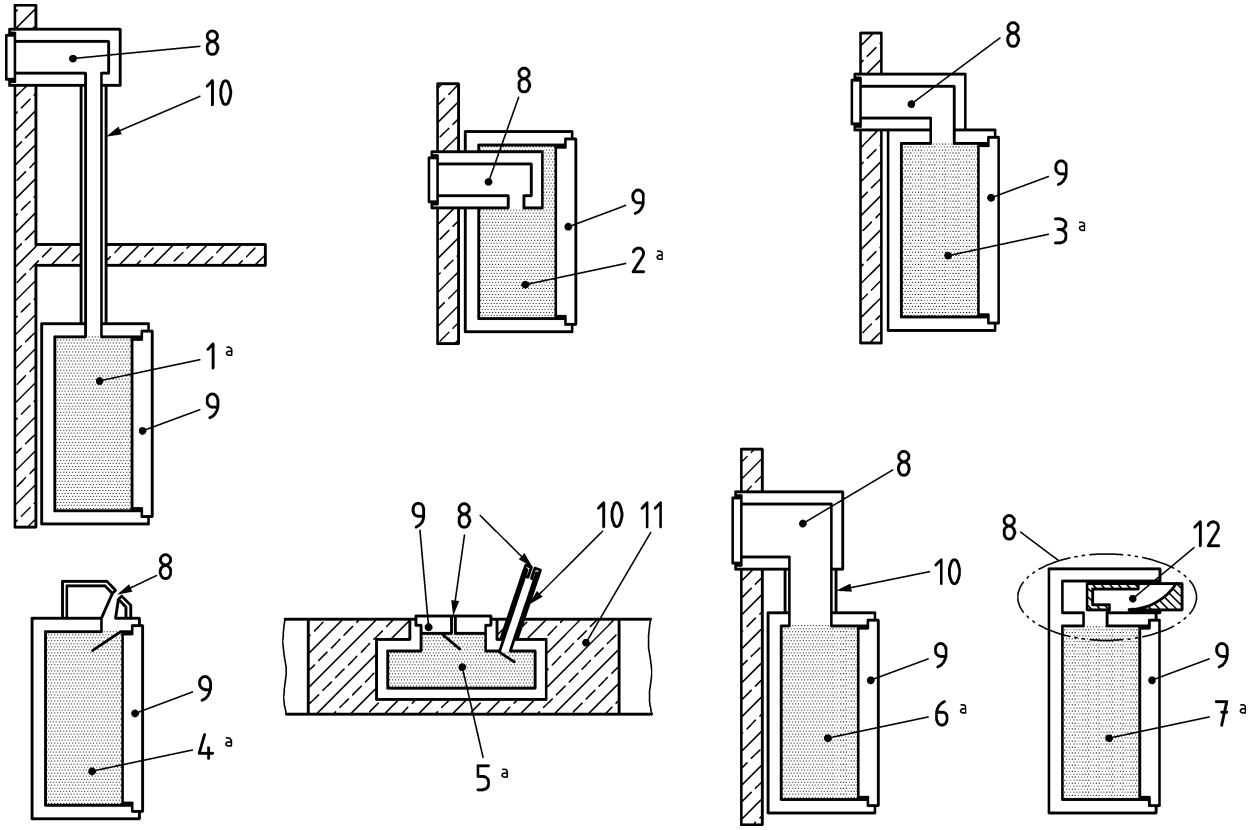
Example of marking:

Manufacturing company name		
Night Safe (N)	EN 1143–2	Resistance grade N-VIII EX
Manufactured 2012	Serial no: 201034	Model no: ABC 526
Size: $a \times b \times c$ / Weight: 1 200 kg		

Annex A
(informative)

Examples of different design of deposit systems

Some examples of different design of deposit systems are shown in Figure A.1



Key

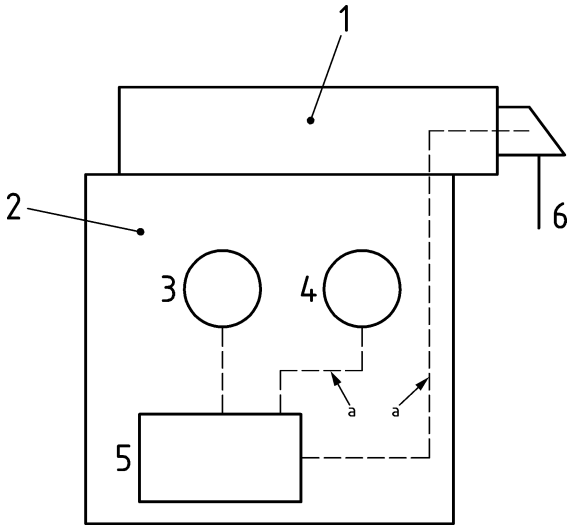
1	Deposit System - type 1	8	input unit
2	Deposit System - type 2	9	receiving unit door
3	Deposit System - type 3	10	chute
4	Deposit System - type 4	11	floor
5	Deposit System - type 5	12	deposit drawer
6	Deposit System - type 6	a	internal space
7	Deposit System - type 7		

Figure A.1 — Designs of deposit systems

Annex B
(informative)

Examples of integrated and distributed deposit system

B.1 Integrated deposit system

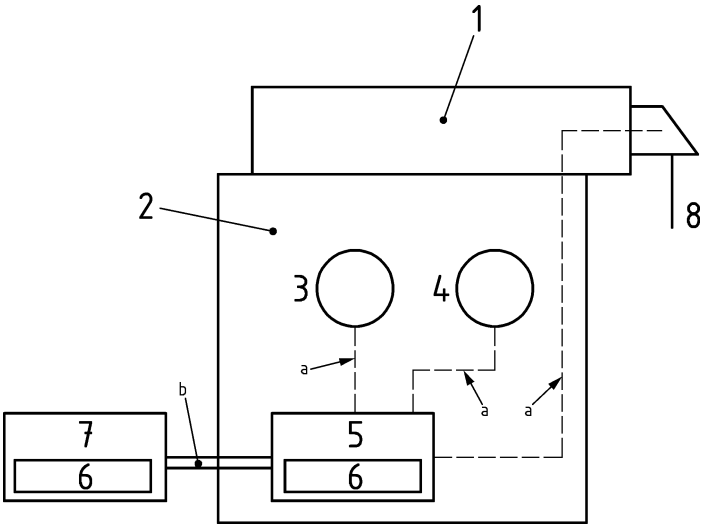


Key

1 input unit
2 receiving unit
3 motor
4 sensor
5 controller unit
6 user interface unit

Figure B.1 — Example of integrated deposit system

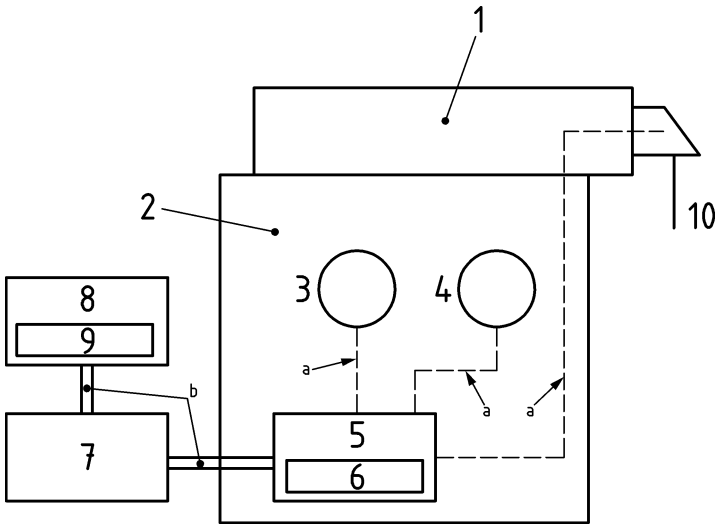
B.2 Different distributed deposit systems



Key

1	input unit	6	decoder/encoder
2	receiving unit	7	controller unit (protected according to 4.4.3.3)
3	motor	8	user interface unit
4	sensor	a	unencrypted data transfer
5	converter	b	encrypted data transfer

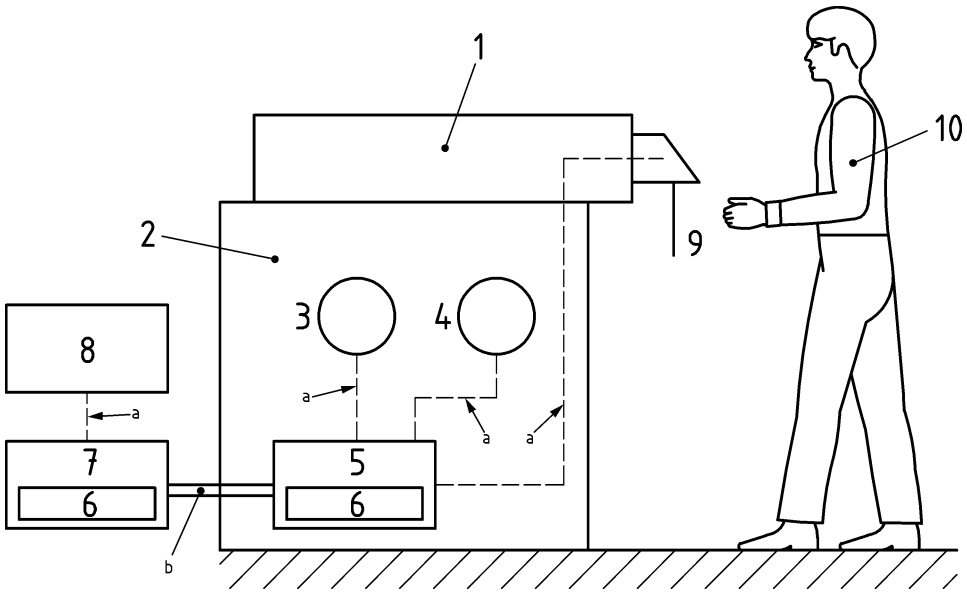
Figure B.2 — Example of distributed deposit system without remote access



Key

1	input unit	7	external user interface unit or data processor
2	receiving unit	8	trusted input unit
3	motor	9	encoder
4	sensor	10	user interface unit
5	controller unit	a	unencrypted data transfer
6	decoder/encoder	b	encrypted data transfer

Figure B.3 — Example of distributed deposit system without remote access



Key

1	input unit	6	decoder/encoder
2	receiving unit	7	controller unit (protected according to 4.4.3.3)
3	motor	8	external user interface unit or data processor
4	sensor	9	user interface unit
5	converter	10	authorising person

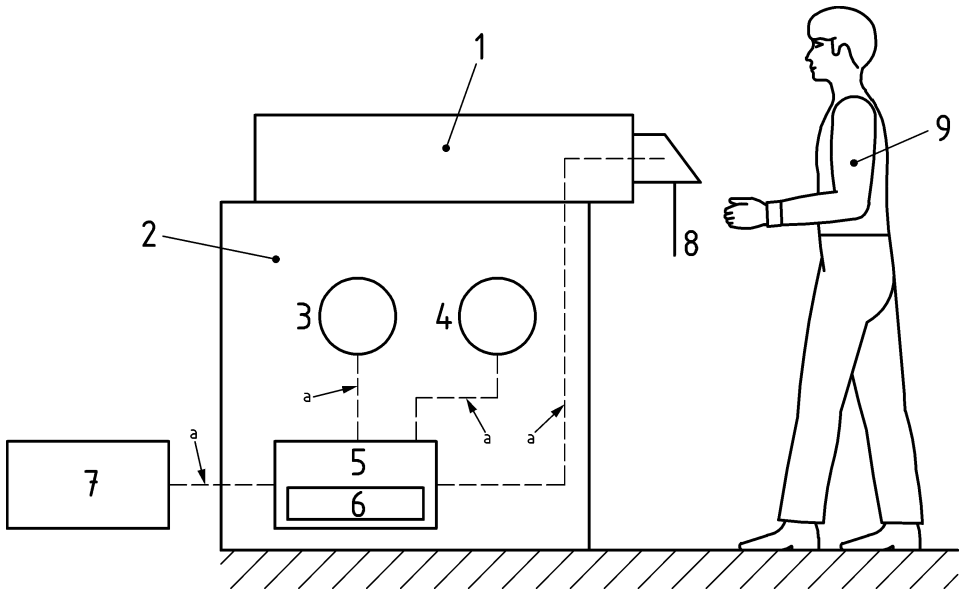
Figure B.4 — Example of distributed deposit system with external user interface for local authorization option 1

Figure B.4 shows an example of a distributed deposit system with external user interface for local authorization (option 1).

The converter comprises:

— decoder / encoder;

— controller outputs of the electronic and electrical components, e.g. motor light barriers, etc.



Key

1	input unit	6	decoder/Encoder
2	receiving unit	7	external user interface unit or data processor
3	motor	8	user interface unit
4	sensor	9	authorising person
5	controller unit	a	unencrypted data transfer

Figure B.5 — Example of distributed deposit system with external user interface for local authorization option 2

Annex C
(informative)

Additional tools for deposit tool attack tests

Table C.1 — Additional tools for deposit tool attack tests (manipulation and fishing devices)

Tool / Material	Specification	Basic value
Magnetic gripping device	Rigid or flexible, length ≤ 1 000 mm	1 RU
Pick up tool	Rigid or flexible, length ≤ 1 000 mm	1 RU
Adhesive tape	length ≤ 5 m	0 RU
Double-faced Adhesive tape	length ≤ 5 m	0 RU
Instant adhesive glue (Superglue)		0 RU
Two components glue		1 RU
Fishing line (twisted or homogenous)	length ≤ 5 m	0 RU
Wire (any metal)	ø0,1 to 10 mm, length ≤ 5 m	0 RU
Screws or thread rods with nuts and washers	M3 to M20, length optional	0 RU
Tube or pipe	øi = 3 to 30 mm, length optional	1 RU
Rectangular pipe (plastic or steel)	Dimension optional	1 RU
Angle profile (plastic or steel)	Dimension optional	1 RU
Paper or paperboard	Dimension optional	0 RU
Plastic foil	Dimension optional	1 RU
Steel foil	Dimension optional	1 RU
Permanent magnet	≤ 1,2 T	1 RU
Electromagnet	≤ 500 mT	3 RU
	> 500 mT	15 RU
Steel plate	Dimension optional	1 RU
Vacuum cleaner	Power ≤ 2 300 W	1 RU
Water		0 RU
Handmade box or similar		18 RU
Handmade shutter or similar		18 RU
Battery	DC ≤ 24 V	1 RU

Tool / Material	Specification	Basic value
Variable output power supply	Input AC ≤ 240 V / Max 16 A	18 RU
Bag / pocket / collecting tray		1 RU

Annex D
(informative)

Structure of test clauses

Table D.1 — Structure of test clauses in EN 1143–2

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Access tool attack tests</td><td>Clause 10
Deposit tool attack tests</td><td rowspan="2">Clause 11
Fixing system tool attack tests</td></tr>
<tr><td>10.1 General for all deposit tool attack tests</td></tr>
<tr><td>9.1 Partial access – tool attack test
9.2 Complete access – tool attack test
9.3 Partial access EX – explosive tool attack test
9.4 Partial access GAS – explosive tool attack test</td><td>10.2 Forcing tool attack test
10.3 Forcing EX tool attack test
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10.5 Fishing tool attack test
10.6 Deposit retrieval
10.7 Trapping last deposit tool attack test
10.8 Repeated trapping tool attack test</td><td>11.1 Fixing system - tool attack without force
11.2 Fixing system - tool attack with force</td></tr>
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