



# GUIDELINE

Requirements on strongrooms in cast in-situ  
and/or pre-fabricated construction

ECB•S R03

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## Foreword

This Guideline has been updated by the European Certification Body GmbH on the basis of various requests from customers. The changes are mainly editorial and were necessary due to an adaptation of the referenced standards. The document was sent to the ECB certificate holders, the ECB certification board ECB•PS for commenting and a public consultation was possible via the ECB website. The received comments were checked and integrate where appropriate.

This guideline supersedes the version of September 2002.

## Amendments:

Compared to the guideline of 2002, the following amendments have been made:

- a) Updates of the scope,
- b) Integrating a definition for an authorized installer and referring to the term in the document.
- c) Adaptation to the current version of the European Standard for strongrooms and strongroom doors EN 1143-1:2019, for example, the values with regard to CD protection were adapted, added to the resistance grade VIII CD and references were updated (see amongst sections 4 and 5.7),
- d) updates of the normative references to the state of the art (date of issue, current sections, etc.).
- e) Change of the DIN standards to current EN standards.
- f) Adding section 5.6 strongrooms with dividing walls.
- g) Clarification of section 5.9.1 "empty conduits" and 5.9.2 („ventilation elements“).
- h) Addition in section 5.9.5 („Concealed electrical wiring, tele-communication wiring and similar installations“) with section 5.9.5.2 („pre-fabricated construction“).
- i) Updating the complete section 5.10 referring to concrete for cast-in situ constructions (renumbering the clauses, clarifications, updating the requirements to current EN standards and to the state of the art.
- j) Updated requirements for „Installation of the door“ in section 7.1.1 to reflect the current practice of European certification bodies.
- k) Clarification of section 8 „Marking“. Traceability to the installer has been added.
- l) Clarifications made in the figures.
- m) Only mirrors were drawn in figure 10 to monitor the surveillance process video surveillance has been added.
- n) Overview Annex C (informative) has been added.

## 1 Scope

This Guideline establishes requirements and technical test criteria for strongrooms consisting of walls (side walls, base, ceiling) and a door. The walls may be built as cast in-situ construction or pre-fabricated construction (as a room-in-room system).

Depending on their resistance, strongrooms are classified in nine resistance grades (V to XIII). A room of a specific resistance grade shall be equipped with a strongroom door of the same or a higher resistance grade.

NOTE: EN 1143-1 also provides for strongrooms of resistance grades 0 – IV. These are not part of this Guideline, but may also be designed in accordance with this Guideline provided that the requirements of EN 1143-1:2019, sections 7.4 and 7.5.3, are met.

Optionally, strongrooms may be provided with additional security features like protection against diamond crown drills (CD protection) and explosives (EX protection).

Annex A2 contains requirements on the construction of the day-lock unit. Annex B gives recommendations for the construction of a control corridor.

NOTE: Strongroom doors (as the limits of the room) are type tested with regard to EN 1143-1 and certified separately independent of the walls. This enables to build different combinations depending on the individual safety requirements. Certificated strongroom doors can be viewed in the product consultant of the certification body.

If products according to EN 1143-1 contain electrical or electronical functional groups, DIN VDE 0833-3 will additionally be applicable.

## 2 Definitions

In addition to EN 1143-1, the following definitions are applicable within the context of this Guideline:

**2.1 Armouring element:** Prefabricated element in strongroom walls of cast in-situ construction.

**2.2 Security element:** Prefabricated element of strongroom walls in pre-fabricated construction.

**2.3 Control corridor:** Corridor around a strongroom used for control purposes.

**2.4 Manufacturer:** According to this Guideline, the manufacturer is the manufacturer of the armouring element (licensee/certificate holder).

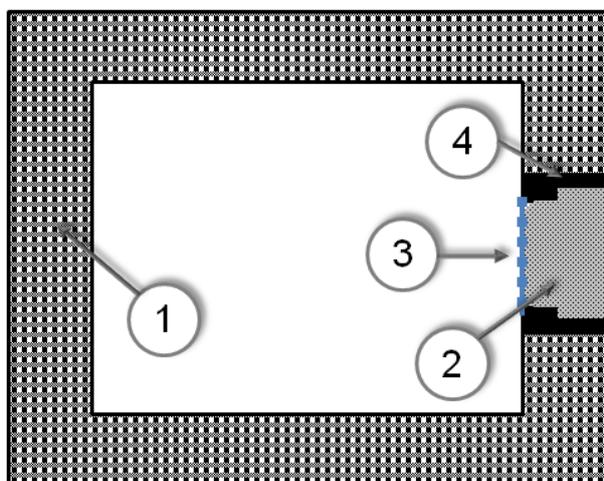
**2.5 Authorized installer** According to this Guideline, the authorized installer is a third party which is authorized by the certificate holder to install the strongroom (e. g. concrete work)

**2.6 Day-lock unit (day gate):** Additional barrier behind a strongroom door (e. g. grille day gate).

**2.7 Strongroom in cast in-situ construction:** Room with walls in cast in-situ construction which is built by joining prefabricated armouring elements with concrete (pouring in concrete into the formwork) on site. It is completed with a strongroom door including a prefabricated frame (see Figure 1).

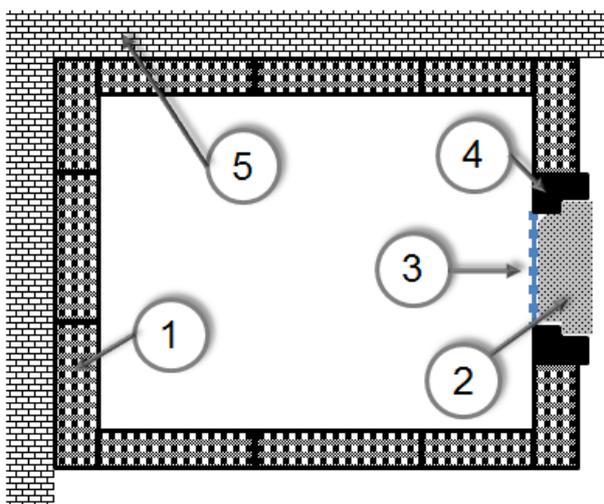
**2.8 Strongroom in pre-fabricated construction:** Room with walls in pre-fabricated construction which consists of prefabricated security elements and is joined on site as a specific construction (room-in-room system). It is completed with a strongroom door including a prefabricated frame (see Figure 2).

**2.9 Deposit system:** A system with an ability to input money and /or valuables into a closed unit which is connected directly or via a connection shaft to an input unit.



- 1 Strongroom walls with armoring elements
- 2 Strongroom door
- 3 Optional day-lock unit
- 4 Door frame

- Figure 1 -

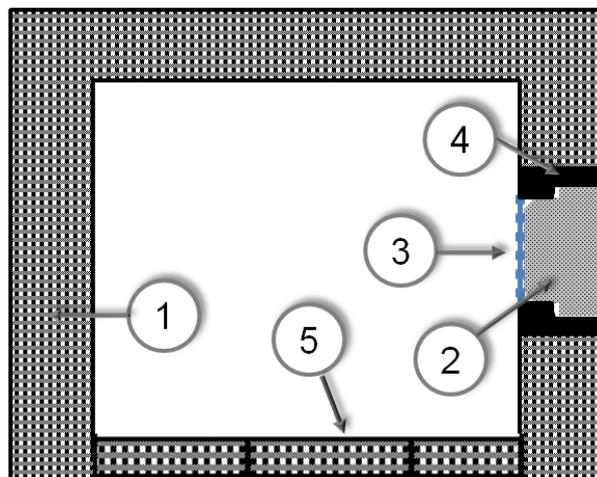


- 1 Strongroom walls out of modules (security elements)
- 2 Strongroom door
- 3 Optional day-lock unit
- 4 Door frame
- 5 Optional building wall (e.g. bricks)

- Figure 2 -

### 2.10 Strongroom in combined design:

Room with walls consisting of a combination of cast in-situ construction and pre-fabricated construction. It is completed with a strongroom door including a prefabricated frame (see Figure 3).



- 1 Strongroom walls with armoring elements
- 2 Strongroom door
- 3 Optional day-lock unit
- 4 Door frame
- 5 Strongroom walls out of modules (security elements)

- Figure 3 -

### 3 Normative references

This Guideline incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Guideline only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- EN 1143-1: Secure storage units – Requirements, classification and methods of test for resistance to burglary - Part 1: Safes, ATM safes, strongroom doors and strongrooms, April 2019

- **EN 206 Concrete – Part 1: Specification, performance, production and conformity**
  - DIN 1045-2 Concrete, reinforced and prestressed concrete structures – Part 2: Specification, properties, production and conformity – Application rules for DIN EN 206-1
  - NF EN 206/CN: Béton – Spécification, performance, production et conformité - Complément national à la norme NF EN 206 (Concrete – specification, performance, production and conformity - national addition to the standard NF EN 206)
  
- **EN 13670 Execution of concrete structures**
  - DIN 1045-3 Concrete, reinforced and prestressed concrete structures – Part 3: Execution of structures – Application rules for DIN EN 13670
  - NF EN 13670/CN: Execution des structures en béton - Complément national à la NF EN 13670 (Execution of concrete structures – national annex to NF EN 13670)
  
- EN 197-1 Cement – Part 1: Composition, specifications and conformity criteria for common cements
- EN 12620 Aggregates for concrete
- EN 1097-2 Tests for mechanical and physical properties of aggregates – Part 2: Methods for the determination of resistance to fragmentation
- ISO 9001 (EN ISO 9001): Quality management systems – Requirements
- DIN VDE 0833-3 Alarm systems for fire, intrusion and hold-up – Part 3: Requirements for intrusion and hold-up alarm systems
- EN 1627: Pedestrian doorsets, windows, curtain walling, grilles and shutters – Burglar resistance – Requirements and classification

## 4 Classification

Strongroom walls for strongrooms are classified in resistance grades in accordance with their resistance against burglary (see EN 1143-1:2019, Table 3).

In derogation of EN 1143-1:2019 (Table 3), Table 1 of this Guideline contains requirements on strongroom walls in cast in-situ construction.

## 5 Requirements

**Table 1 - Minimum requirements for the classification of strongroom walls in cast in-situ construction**

Resistance grade	Resistance grade in RU for complete access	Wall thickness	Number of standard armouring elements "N"	Number of special armouring elements "X"	Additional requirements for "CD" protection <sup>1)</sup> (optional) Resistance value in RU	Additional requirements for "EX" protection (optional) Resistance value in RU for post-detonation attacks (complete access)
V	270	≥ 400 mm	1	-	-	14
VI	400	≥ 400 mm	1	-	-	20
VII	600	≥ 400 mm	1	-	-	30
VIII	825	≥ 400 mm	-	1 (CD)	10.000	41
IX	1.050	≥ 400 mm	-	1 (CD)	10.000	53
X	1.350	≥ 500 mm	-	1 (CD)	10.000	68
XI	2.000	≥ 600 mm	-	1 (CD)	10.000	100
XII	3.000	≥ 750 mm	1	1 (CD)	10.000	150
XIII	4.500	≥ 1.000 mm	-	2 (CD)	10.000	225

\* The minimum requirements described here **do not** exclude type testing. The specification of the required test specimens is carried out by the testing laboratory (ECB approved cooperation partners), if necessary in coordination with the certification body. In order to reduce the test effort, two resistance grades (VII and IX) are usually subjected to a type test in the specified configuration, so that an evaluation of the remaining resistance grades by extrapolation of the results is possible.

## 5.2 Armouring elements

### 5.2.1 General

For the erection of a strongroom in cast in-situ construction, compact, prefabricated armouring elements (see 2.1) with a size of at least 1.5 m<sup>2</sup> (excluding single distance and corner elements for adjustments to the room geometry) should be used. The dimensions of the armouring elements shall be adapted to the requirements on site. Where necessary, their weight shall be dimensioned for transportation and installation by persons. The armouring

### 5.1 Strongroom walls in cast in-situ construction

The sections 5.1, 5.2 and 5.3 refer to strongroom walls in cast in-situ construction.

A summary of the requirements on the design and wall thickness of different resistance grades where armouring elements (see 2.1) are used is given in Table 1.

elements shall be designed such that they are sufficiently stable both for transportation and for storage (in stacks). Where necessary, walking on the armouring on the base and the ceiling while the strongroom is being built shall be considered separately. Designs with permanent formwork are permitted.

### 5.2.2 Design (Recommendation)

With due consideration to all requirements, the design of strongrooms in cast in-situ construction may be as follows:

All technical elements which are important as far as security is concerned shall be permanently connected with the armouring element and must neither deform nor move when the concrete is poured. Provisions shall be made for appropriate clearances for the compaction of the concrete. Due to the concrete cover which must be provided by the client as well as the installation of a contraction armouring, the armouring elements must not exceed the following thicknesses:

Standard armouring element "N"  $\leq 100$  mm  
Special armouring element "X"  $\leq 250$  mm

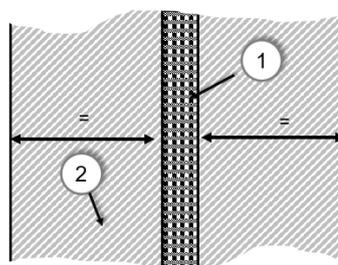
Standard armouring elements "N" may be built at one level with sufficient expansion and the appropriate supports. With isolated armouring elements, e.g. helical flat steel or special polyp-type steel rails, the distance from axis to axis should not exceed 125 mm. Normally a special drill protection, deep anchoring and spacers are not necessary.

Special armouring elements "X" shall consist of two or three levels with sufficient expansion and the appropriate supports. Here as well, the distance should not be more than 125 mm. Every level should be arranged with a sufficient mismatch to the following level. The levels should be firmly and positively connected with each other through deep anchors of sufficient thickness (100/150 mm grid). Special drill protection should be available for one level, with the "CD protection" type for two levels.

### 5.3 Position of the armouring elements in the walls

#### 5.3.1 Resistance grades V - XI

The armouring element according to Table 1 should be installed centrally in the wall.

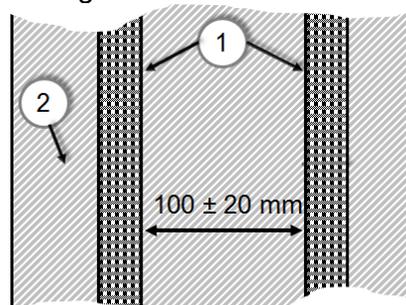


- 1 Armouring elements
- 2 Wall

- Figure 4 -

#### 5.3.2 Resistance grades XII - XIII

The clear distance between the armouring elements shall be at least  $(100 \pm 20)$  mm according to Table 1 (also see Figure 5). However, the minimum concrete cover  $C_{min}$  according to EN 1992-1-1 must not be undercut.



- 1 Armouring elements
- 2 Wall

- Figure 5 -

### 5.4 Strongroom walls in pre-fabricated construction

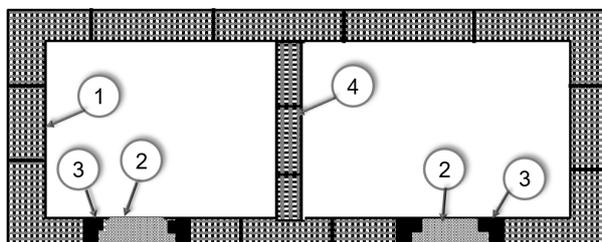
Strongroom walls in pre-fabricated construction exclusively consist of prefabricated security elements (see 2.2) which are joined to an independent construction on site. The security elements shall fulfil the requirements according to EN 1143-1:2019 (Table 3).

### 5.5 Strongroom walls in combined construction

Strongrooms may also be built with a combination of cast in-situ construction and pre-fabricated construction.

### 5.6 Strongrooms with dividing wall

In the case of strongrooms where the use of dividing wall creates two separate secure areas (Figure 6), a separate assessment must be carried out by the certification body.



- 1 Strongroom wall with armoured or security elements
- 2 Strongroom door
- 3 Door frame
- 4 Dividing wall with armoured or security elements

- Figure 6 -

### 5.7 Additional requirements for protection against attacks with explosives ("EX protection") for constructions in modular, solid and combined design

Strongroom walls with "EX protection" must additionally fulfil the resistance values for post-detonation attacks shown in Table 1 of this guideline. Openings shall be designed such that they cannot be used to transport explosive materials (e.g. igniters or charges) into the interior.

The additional test with explosive materials shall be made in accordance with EN 1143-1:2019, Clause 9.

### 5.8 Additional requirements for protection against attacks with core drilling equipment ("CD protection") for constructions in modular, solid and combined design

If the strongroom wall shall have CD protection, the wall as from resistance grade VIII on shall be dimensioned for a resistance value in accordance with EN 1143-1. The requirements of Table 1 must be fulfilled. The additional test with the diamond core drill device is made in accordance with EN 1143-1:2019, Clause 11.

### 5.9 Built-in fittings and wall holes

#### 5.9.1 Empty conduits for constructions in cast in-situ-, pre-fabricated and combined design

Conduits passing through the wall (room ventilation, cable ducts, etc.) are permitted up to an internal diameter of 51 mm (2" resp.). These conduits shall either be cranked on both sides or be equipped with other obstacles e.g. by welding in a warped flat steel in such a way that a direct view into the room is not possible. The installation of suitable hollow sections of deviating geometry, e.g. rectangular tubes is possible, if the usable internal cross section does not exceed 20 cm<sup>2</sup> and the largest internal dimension does not exceed 70 mm.

Where openings intended solely for the passage of cables are used, these cable ducts shall not exceed 100 mm<sup>2</sup> in accordance with EN 1143-1:2019, clause 4.2.1.

Unused cable ducts shall be blocked or closed by the manufacturer / authorized installer in such a way that these closures cannot be removed from the outside without leaving visible traces.

If several conduits are used, they shall be installed with a minimum clearance of 200 mm (centre to centre) and they must only be aligned in one direction (horizontally or vertically) in relation to a distance of 500 mm.

Conduits should preferably be installed in the upper or lower third of the room (related to the internal height). They shall be placed in the appropriate clearances in the armouring elements.

On conduits of types which do not satisfy the above-mentioned requirements, a type-test shall be made.

### 5.9.2 Ventilation elements (Ventilation) for constructions in cast in-situ-, pre-fabricated and combined design

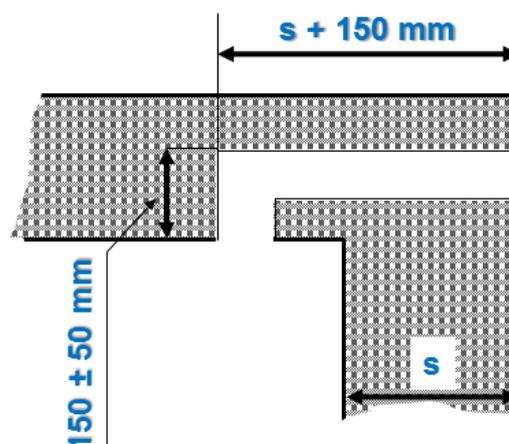
Ventilation elements (e.g. bundle ventilation) may be used, they shall, however, be type-tested. They must be constructed in such a way that it is not possible to see or reach into the room.

A type-test may be dispensed with, if alternatively a so-called angle-type ventilation is installed in accordance with the following requirements:

- The internal cross section of the ventilation duct must not exceed 200 cm<sup>2</sup>. One of the internal dimensions (height, width or diameter) shall be  $\leq 100$  mm.
- The ventilation duct shall be L-shaped (see Figure 7). The long side shall have a minimum wall thickness of  $s + 150$  mm, the short side of  $(150 \pm 50)$  mm. Existing stops and mounting devices shall be excluded.
- The internal space of the ventilation duct must be equipped with welded-in internal armouring (strips) of at least 2.5 mm thickness over at least 25 % of the length of every side. In the area of the armoured sections of the duct, the available cross section must taper to  $\leq 100$  cm<sup>2</sup>. The longitudinal axis of the cross section of a built-in duct shall run flush to one edge of the internal space.
- The armouring elements shall be placed as close to the ventilation element as possible and shall be rigidly and permanently joined with it (e.g. through welded joints). As an alternative, the same number of additional armourings with the same function may be inserted in intermediate layers in such a

way that they overlap at least 150 mm upward and downward.

If the constructional conditions require a higher air flow rate, several right-angle ventilation elements may be used. The clearance between the ventilation elements shall then be  $\geq 1\,000$ mm.



s Thickness of the strongroom wall

- Figure 7 -

### 5.9.3 System-related openings for constructions in cast in-situ-, pre-fabricated and combined design

Strongroom walls shall not have any holes in the protective materials which are not absolutely necessary for locks, cables, anchoring purposes or other additional equipment (e.g. ventilations).

System-related openings for deposit systems (e.g. day-night safes) are permissible up to a size of 200 cm<sup>2</sup> in connection with an installed deposit system (drop-in hole, chute and cassette receiving unit) if they are entered in the design drawings and fulfil the requirements according to EN 1143-1:2019, clause 7.4 and 7.5.3.

#### **5.9.4 Holes for transportation and assembly for constructions in cast in-situ, pre-fabricated and combined design**

Holes for transportation and assembly (e.g. of prefabricated security elements for strong-room walls in pre-fabricated construction) shall be recorded in the Technical Documentation.

NOTE: These holes may be used in the type tests as points of attack.

#### **5.9.5 Concealed electrical wiring, telecommunication wiring and similar installations**

##### **5.9.5.1 In cast in-situ constructions**

Per m<sup>2</sup> of the wall, floor and ceiling surface, not more than one concealed unit (e.g. concealed splitting box) may be installed. The minimum distance to the next installed unit shall be  $\geq 600$  mm. The installation depth may be 15 % of the wall thickness, but not more than 80 mm. The area must not exceed 45 cm<sup>2</sup>. Every concealed wiring shall only be connected via one supply lead and one terminal lead each. The outer duct diameter shall not exceed 20 mm.

If the standard number, installation depth or cross section are exceeded, the wall shall to be reinforced by the dimension of the deepest indentation.

If provisions have been made for a concealed wiring of structure-borne sound alarms, the maximum mounting depth may be 80 mm and the maximum surface may be 250 cm<sup>2</sup>. Upon completion of the room, the structure-born sound alarms shall be completely installed and connected with a recognised intruder alarm system (IAS).

The installation of concealed wiring at a later date is not permitted.

##### **5.9.5.2 In pre-fabricated constructions**

Concealed installation (e.g. flush-mounted junction box) is possible, but must be subjected to a type test.

## 5.10 Production, processing and after-treatment of concrete in cast-in situ construction

### 5.10.1 General

Strongroom walls in cast in-situ construction are built by joining prefabricated armouring elements (see 2.1) with concrete (pouring in concrete into the formwork) on site. The following clauses define requirements on the production, processing and aftertreatment of the concrete needed for this.

Proof of a concrete aptitude test in accordance with the building regulations relevant to the erection site must be provided.

### 5.10.2 Regulation

The regulations applicable to the production, processing and aftertreatment of concrete shall be complied with EN 206 (and if relevant according to the national application standards relevant for the installation site, such as DIN 1045-2 in Germany or NF EN 206/CN in France), and EN 13670.

#### 5.10.2.1 Cement

The cement used shall be in accordance with EN 197-1 and shall be suitable for the respective wall thickness.

#### 5.10.2.2 Concrete aggregate

In addition to EN 206 aggregates shall comply with EN 12620

Selected aggregates shall have:

- Minimum raw density of the aggregates must be at least equal to the value of the aggregates used in the type test according to EN 1143-1 (usually  $>2.6 \text{ g/cm}^3$ ).
- Coarse aggregation with a coarsest fraction with a dimension between 16 mm and 32 mm.
- Maximum values of fine content in the category  $f_{1,5}$  according to EN 12620

- Resistance to impact crushing according to EN 1097-2 Category  $\leq \text{SZ}_{22}$  or a resistance category to fragmentation  $\leq \text{LA}_{25}$

#### 5.10.2.3 Compressive strength of concrete

The compressive strength of the concrete established after 180 days shall be at least  $60 \text{ N/mm}^2$  (60 MPa) for a cube (cube compressive strength).

#### 5.10.2.4 Concrete: water and additives

The water-cement ratio must definitely not exceed a value of 0.42.

Plasticizers (FM), retarders (VZ) and other concrete admixtures shall only be used, if a test certificate has been issued (e.g. by Deutsches Institut für Bautechnik (DIBT)) and their suitability has been established by means of an aptitude test.

#### 5.10.2.5 Setting of the fresh concrete

The setting of the fresh concrete consistence shall be such that it is suitable for being processing for the respective element of the construction. The temperature of the fresh concrete shall be kept at the lowest-possible level.

### **5.10.2.6 Concrete aftertreatment**

The requirements of EN 13670 (and of the national application standards relevant to the installation site, such as DIN 1045-3 in Germany or NF EN 13670/CN in France) with regard to the curing of the concrete, including the curing periods, must be observed in order to keep early shrinkage to a minimum and to ensure sufficient fatigue strength.

### **5.10.2.7 Supervision**

Monitoring of the concrete shall be ensured at least according to surveillance class 2 of EN 13670 (and according to the national application standards relevant for the installation site, such as DIN 1045-3 in Germany or NF EN 13670/CN in France).

## **5.11 Technical documentation**

The certificate holder of strongroom walls shall have a technical documentation in accordance with EN 1143-1:2019, Clause 5.

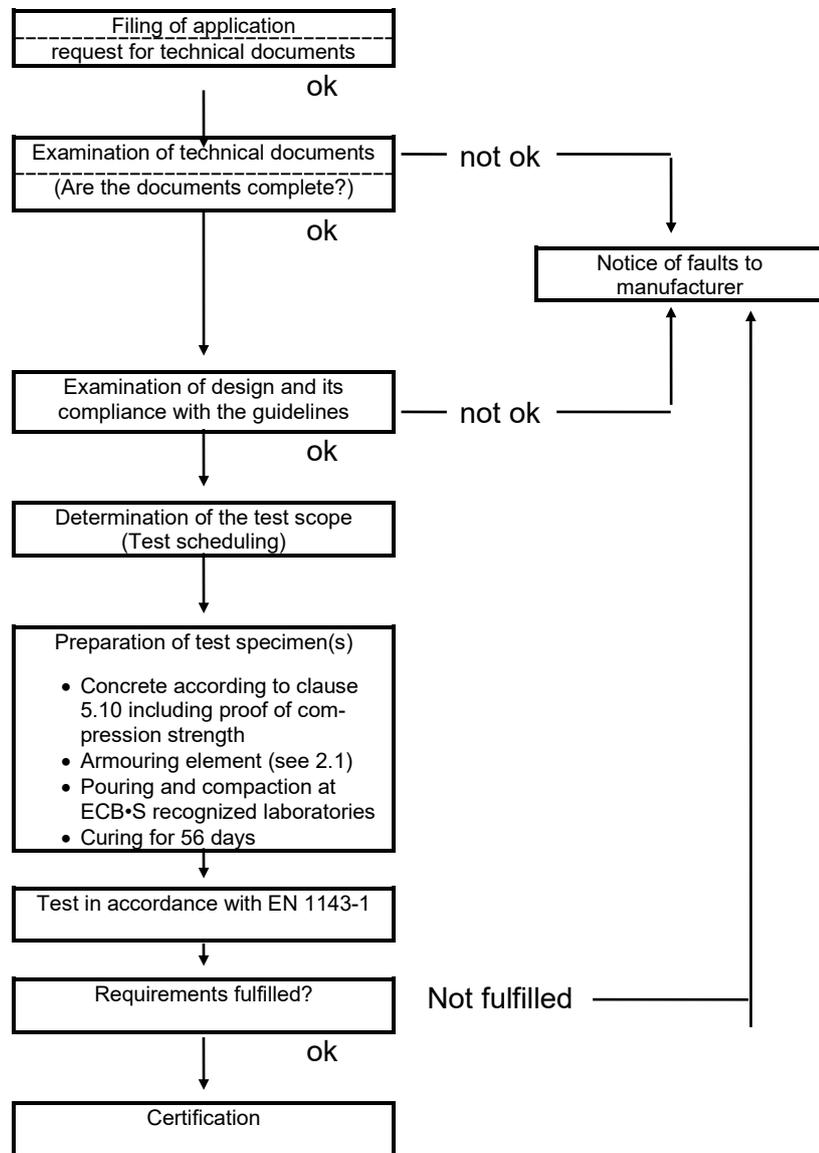
## **6 Tool Attack Test**

### **6.1 Test procedure**

The type tests on strongroom walls in cast in-situ construction are made in accordance with the test schedule shown in Figure 8.

### **6.2 Specimen room documentation**

For every resistance grade, a specimen room documentation shall be presented.



- Figure 8 -

## 7 Design and Construction

### 7.1 Documentation

All security relevant measures which need to be considered in design and construction shall be clearly and unmistakably recorded in a documentation.

The documentation for the installation of the room door shall particularly deal with the following items:

- Rebate structure (reveal structure)
- Joint between the door sill and the strong-room floor
- Permitted maximum distance between the rough work hole for the strongroom door and the external dimension of the strong-room door (gap which needs to be filled).
- Specifications for filling possibilities (holes for filling)
- Specifications for packing and compacting the concrete in the space between the strongroom walls and strongroom door (for concrete, see Clause 5.10)
  - If there is no joint to the armouring elements, the filler (concrete) shall be in accordance with Clause 5; the installation of the door and the joint to the walls shall be described in detail in the Technical Documentation.
  - If there are joints to the armouring elements, proof of the compression strength is not required (for concrete, see Clause 5).

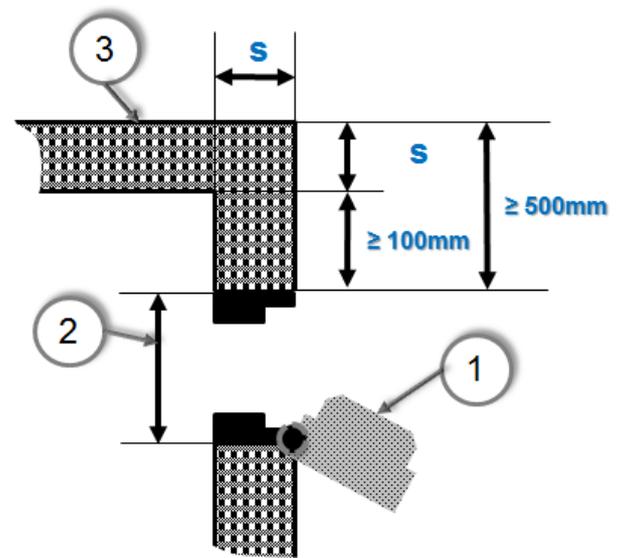
#### 7.1.1 Installation of the strongroom door

The strongroom door(s), respectively, shall be type-tested in accordance with EN 1143-1: 2019 and shall at least have the same resistance grade as the walls or a higher one.

With strongrooms in cast in-situ construction and/or pre-fabricated construction, the distance between the outer edge of the walls and the rough door opening shall not be less than 500 mm (see Figure 9).

The distance from the boltwork cover plate to the outer edge of the rear wall must be at least 2 500 mm.

Deviations from the 500 mm or 2 500 mm rule may be permitted on the basis of tests or approved compensation measures.



- 1 Strongroom door
- 2 Door shell opening
- 3 Strongroom wall
- s Thickness of the strongroom wall

- Figure 9 -

#### 7.1.2 Expansion joints in cast in-situ constructions

Where expansion joints are needed due to the design and construction, the respective wall(s) shall be heightened to the left and right over a range of  $\geq 500$  mm to the 1.5 fold value of the standard resistance value (e.g. by strengthening the walls or by using additional security elements in pre-fabricated construction). The expansion joint must not run straight through the walls, and it shall not be more than 30 mm wide.

All armouring elements beside the expansion joint shall be X-modules in CD-construction. The distance from the armouring elements to the respective boundary surfaces of the expansion joint shall not exceed 50 mm.

### **7.1.3 Water barriers in cast in-situ constructions**

Where water barriers are needed, the strong-room walls shall be reinforced to be 100 mm thicker at least 500 mm over and under the water barrier (where appropriate, under it only down to the bottom edge of the base or the bottom edge of the floor).

### **7.1.4 Column openings in cast in-situ-, pre-fabricated and combined design**

Where for static reasons bearing columns or supports need to run through the strongroom, the resistance value of the walls shall be increased to the 1.5 fold value of the standard resistance value in an area of 500 mm around the hole (e.g. by reinforcing the walls or by using additional security elements).

### **7.1.5 Construction joints in cast in-situ constructions**

All construction joints caused by the progress of the concrete work shall comply with EN 13670.

## **8 Marking**

The walls and the door shall be marked in accordance with EN 1143-1:2019, Clause 14.

A strongroom or door is only considered to be ECB•S certified if it also bears an "ECB•S certification mark".

The certification marks are numbered consecutively (Cert. mark No.). Their assignment to products of a certificate holder is documented by ECB. The certificate holder must keep a quality record based on the numbering of the marks, by means of which the mark can be traced back to the manufactured product and installer (third party company according to Annex A.1.1).

## **Annex A (Normative)**

### **A.1 Construction of a strongroom**

#### **A.1.1 Responsibility**

The licensee is allowed to build strongrooms of certain resistance grades in compliance with EN 1143-1 and the necessary Technical Documentation. Upon completion, the manufacturer / authorized installer shall mark the walls and the door with the ECB•S certification mark. By doing this, he will confirm that the strongroom complies with the requirements of EN 1143-1 and has been certified in accordance with EN 1143-1.

NOTE: Normally, the construction (concrete work) of the strongroom is not performed by the manufacturer (holder of the certificate), but by an authorized installer. The manufacturer shall provide this authorized installer with all information needed for the execution of the construction in compliance with this Guideline. In addition, the manufacturer shall satisfy himself, e.g. by checking certificates, that the construction measures have been executed according to the specifications.

In the annual ECB audit at the manufacturer (holder of the certificate), it can be checked whether authorized installers have received the necessary information.

#### **A.1.2 Modifications**

If subsequent modifications of a strongroom certified by ECB•S are not the subject of the documentation (e.g. additional holes in the walls), these are not permitted.

NOTE: In this case, the strongroom will lose its ECB•S certification. The certification mark shall be removed.

#### **A.1.3 Documentation**

The construction of ECB•S certified strongrooms shall be documented within the framework of the certified quality management system according to ISO 9001 (EN ISO 9001).

#### **A. 1.4 Building site supervision**

The ECB•S reserves the right to make inspections on site after the construction of ECB•S-certified rooms. If a documentation is not satisfactory or clear enough, the ECB•S is entitled to request core drillings (e.g. in order to test the concrete) in coordination with the client and the construction firm.

## **A.2 Day-lock unit (day gate)**

For organizational reasons it may be necessary that access to the strongroom is not possible for any person while the door is open (see Figures 1, 2 resp. 3).

If an access restriction is required (e.g. by the insurer), a burglar-resistant door of resistance class RC 2 according to EN 1627 must be used for this day closure (day door).

## Annex B (Informative)

### Control corridor

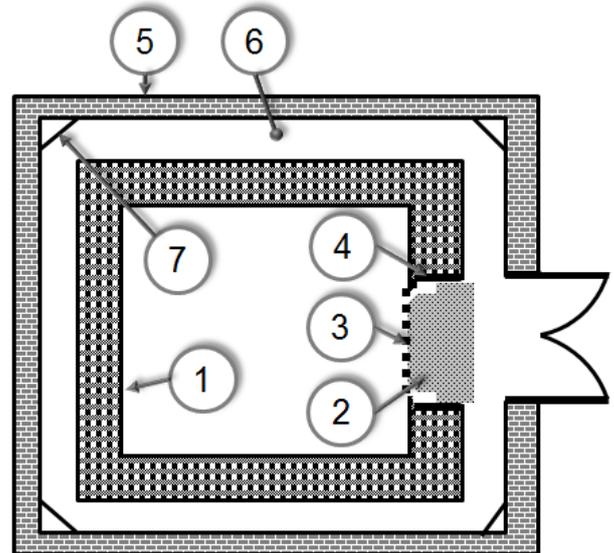
For control purposes and in order to impede burglary attempts, a room may be equipped with a corridor around (control corridor). The wall separating the control corridor from other areas should at least be fixed and solid.

This control corridor should be no more than 500 mm wide and should only have one access. The entrance should be designed at least as a burglar-resistant door of resistance class RC 2 according to EN 1627.

Where there are particularly high risks, the control corridor should be extended to the ceiling and base.

It should be possible to observe the control corridor without any difficulty (e. g. by means of mirrors or – preferably – video surveillance).

NOTE: The control corridor should be controlled by means of a recognised intruder alarm system (IAS).



- 1 Strongroom wall
- 2 Strongroom door
- 3 Day-lock unit (day gate)
- 4 Door frame
- 5 Building wall (e.g. brick)
- 6 Control corridor
- 7 Mirror or video surveillance

- Figure 10 -

**Annex C (Informative)**

Overview of the individual sections and their scope of application

Clause	Cast in-situ construction	Pre-fabricated construction	Combined construction
1) Scope	X	X	X
2) Definitions	X	X	X
3) Normative references	X	X	X
4) Classification	X	X	X
5) Requirements	X	X	X
5.1) Strongrooms in cast in-situ construction	X		X
5.2) Armouring element	X		X
5.2.1) General	X		X
5.2.2) Design (Recommendation)	y		X
5.3) Position of the armouring element	X		X
5.3.1 Resistance grades V - XI	X		X
5.3.2 Resistance grades XII - XIII	X		X
5.4) Strongrooms in pre-fabricated construction		X	
5.5) Strongrooms in mixed construction			X
5.6) Strongrooms with dividing walls	X	X	X
5.7) Additional requirements for protection against attacks with explosives ("EX-Protection")	X	X	X
5.8) Additional requirements for protection against attacks with core drilling equipment ("CD-Protection")	X	X	X
5.9) Fittings and wall openings	X	X	X
5.9.1 Empty conduits	X	X	X
5.9.2 Ventilation elements	X	X	X
5.9.3 System-related openings	X	X	X
5.9.4 Openings for transport and assembly		X	
5.9.5 Concealed electrical wiring, telecommunication wiring and similar installations	X	X	X
5.9.5.1 in cast in-situ construction	X		X
5.9.5.2 in pre-fabricated construction		X	X
5.10) Production, processing and aftertreatment of concrete	X		X
5.11) Technical documentation	X	X	X
6) Tool attack test	X	X	X
6.1 Test procedure	X		X
6.2 Specimen room documentation	X	X	X
7) Design and construction	X	X	X

Clause	Cast in-situ construction	Pre-fabricated construction	Combined construction
7.1 Documentation	X	X	X
7.1.1 Installation of the strongroom door	X	X	X
7.1.2 Expansion joints	X		X
7.1.3 Water barrier	X		X
7.1.4 Column openings	X	X	X
7.1.5 Construction joints	X		X
8) Marking	X	X	X