SKG-AE 3104

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ADDITIONAL REQUIREMENTS

FOR PRODUCT CERTIFICATION FOR BUILDING HARDWARE BASED ON BRL 3104

These assessment guidelines are a translation of the original Dutch text. In case of disputes with regard to interpretation, the Dutch text shall be binding.

Uitgave SKG

GENERAL INFORMATION

At its meeting of 08-12-2009, the Board of Experts for Security and Burglary Resistant Products has decided that BRL 3104 is the basis for Product certification of building hardware.
The BRL 3104 mentioned refers to classification and testing according to NEN 5089 and to this SKG-AE.
Decisions of the Board of Experts will be added to this document and published on the SKG-site.

These assessment guidelines have been produced in collaboration with the following parties:
VHS (association of manufacturers of building hardware)
ABHS (general association of building hardware)
CCV (centre for crime and security)
SKH (certification institute for wood products)
NPI (national police institute)
Aegon Insurance
NLingenieurs (Dutch association of consulting and civil engineering)
NSSG (locksmiths and security)

SKG is approved, in accordance with NEN-EN 45011 and NEN-EN-ISO/IEC 17.021, by the Dutch Accreditation Council (RvA) for the following certification systems:
Attestation, Product Certification, Process Certificate and Quality System Certification in the fields of:
- **Metal and Plastic facade elements**
- **Door and window furniture**
- **Security glazing**
- **Cladding**
- **Glue for attaching siding,**

The laboratory of SKG is accredited for various activities according to NEN-EN-ISO/IEC 17.025.

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NR SUBJECT

1. Introduction

The National Assessment Directive BRL 3104 is the certification basis for burglar resistant building hardware (the granting of SKG-stars).

Where possible the BRL refers to the Dutch national standard:

NEN 5089: building hardware - Requirements and test methods

for requirements and test methods for various products and for the three classes.
(where possible NEN 5089 refers for test methods to the relevant European standards)

In this NEN standard, however, not all security products for windows and doors are described and it is, -in its nature as national standard-, a relatively static document.

For this reason BRL 3104 not only refers to NEN 5089 but also to this

SKG AE- 3104: Performance- , product- , and other requirements for security products for doors and windows - additional requirements for BRL 3104

All decisions made by the Board of Experts for Security and Burglary Resistant Products as an addition to NEN 5089 are collected in this document and are also the basis for the SKG certification of hardware.

2.01 Product requirements as criteria for burglar resistance

Decision: : 15-aug-05

Introduction:
Many years of experience by SKG has taught us for some products which values for strength and dimensions are sufficient to guarantee that those products are burglar resistant.
These criteria can then replace the manual test.

Decision:
It is possible to certify the below mentioned products based on reproducible laboratory tests. *)

Explanation:
If the mentioned requirements are not fulfilled this does not mean that the products are not burglar resistant . In that case a manual test is required.

Product / Description	1 star	2 star	3 star
Single Locks and Bolts (with straight bolts)			
Length of the bolt - minimum in mm	**20**	**20**	**20**
Side force in kN (unsupported lock case)	**6**	**7**	**7**
End load on bolt (with well fitted box locking plate) in kN	**2**	**2**	**4**
Security shields (if made out of solid extruded aluminium strip)			
Force test according 30.18 (EN 1906 A3.3), F in kN remaining deflection ≤ thickness shield – 4 mm, screws are not allowed to fail.		**10**	**15**
Force test according 30.19 (EN 1906 A 3.4), F in kN Remaining deflection ≤ 5 mm , screws are not allowed to fail.		**15**	**20**
For shields with cylinder protection: Force test according 30.20 (EN 1906 par.), F in kN Cylinder protection must be able to withstand this force		**10**	**15**
Hinges with burglar resistant pins			
Length pin - minimum in mm		**18**	**18**
Side force on pin in kN (test similar to EN 12209) Deformation pin ≤ 8 mm		**6**	**7**

*) It has been decided that new applicants in a certain product group are not allowed to take advantage of this approach.

2.02 Reference Doors and Windows - General

Decision CvD : 09-apr-09 Last change: 18- dec-09

Introduction:
In NEN 5089 it is mentioned that the classification of building hardware is based on (upon other things) a manual test on doors or windows that are comparable to the most common constructions in both existing as well as new dwellings.
Annex A of NEN 5089 defines this representative elements in general terms.

For certification purposes SKG has defined these doors and windows more precisely.
Products, classified in this way are:

* Applicable within PKVW -BB (Police Mark for Existing Houses).
* Applicable in doors and windows, described in the SKH publication 08-08 (wood).

SKG- certified hardware, used in wooden doors and windows (according the SKH publication) or metal or PVC doors and windows systems (for which a SKG-KOMO-Attest for burglar resistance systems exists) makes that these elements will meet class 2 (or higher) of NEN 5096 and EN 1627.
Class 2 is according Dutch Building Regulations required for normal houses.

General rules and conditions:

1. Build-in hardware products that are applicable in both opening directions (inward and outward) are tested in the most critical direction. The test result also applies for the other direction.
2. Build-on products which can be used in both inward and outward opening direction (with different locking plates) must be tested in both directions .
3. Tilt and turn hardware , suitable for both inward and outward directions should be tested in both directions.
4. Equivalence of hardware is determined by SKG.
5. Laboratory tests of hardware products are carried out by SKG.
6. The manual tests are carried out by SKG in cooperation with SHR.
7. SKG shall ensure that certified products, intended for use in wood, will be included in the SKH-publication.
8. The manual test must be carried out on 2 elements (preliminary test and main test). It is acceptable to perform just one test but in that case the test must be convincing.
   (in fact it is a preliminary test that is so convincing that a main test is superfluous.
9 Tests for SKG *** rating will be performed with a crowbar of 710 mm (according EN 1627).
   If the intended use is solely for the Dutch market it is allowed to use a crowbar of 510 mm (according to NEN 5096).
10 For SKG* and SKG**. The mounting instruction should mention that in case of softwood substrate all essential screws must be 10 mm longer.

For further information about the exact design of the representative elements please contact SKG

2.03 Combination lock on bolts

CvD decision: 4 July 2002

Introduction:
The standard NEN 5089 requires that windows should be lockable with a key.
A combination lock does not fulfil this criterion.

Decision:
Window locks (such as handles) can be lockable with a combination lock.
This combination lock must have a minimum of 500 combinations.
The user must be able to change the code.

Other conditions:
The manual should describe that such a lock is applied only to windows.

2.04 Keypad

CvD decision: 9 okt 2003 Last Change: 9 okt 2003

Introduction:
The standard NEN 5089 requires that a lock is key operated.
A keypad does satisfy to the common term “key“.

Decision:
Keypads are considered equivalent to a key.

Requirements:

The minimum number of codes depends on the number of potential users with there own code;

Number of potential users with **own** code	Minimum length of code	Number of codes
1 t/m 3	4 positions	10^4 = 10.000
4 t/m 30	5 positions	10^5 = 100.000
> 30	6 positions	10^6 = 1.000.000

Privacy protected (privacy shield) and installed in such a way that no more than 50% of the keypad is visible from a point above a horizontal plane 1000 mm above ground level.

The protection must be sustainable and may not be easily dismantled (bonding or one-way screws).

2.05 Motors for Garage doors

CvD decision: 9 okt 2003

Introduction:
A motor for a garage door can be considered a lock .

Decision:
Motors for garage doors can be certified also according to BRL 3104 as a lock.
So far just for 1 star (i.e. RC 2: 3 minutes)

Conditions:
* Resistance to static load of 3kN (= static load belonging to class 2 of ENV 1628)
* Fixing points on the door should be sufficiently protected and impossible to dismount.
* Mechanical emergency facility not accessible from the outside.

2.06 Electrically operated builing hardware

CvD decision: B-07-03: d.d. 03-04-07

Introduction:
NEN 5089 states at 5.2.8 _ Requirements for electric or electronic hardware:
"The mechanical performance requirements related to burglar resistance of electric or electronic hardware are the same as for manual operated hardware." with as remark: "A possible manual attack on electronic components is not in the scope of this standard".
Considering only the mechanical aspects in the assessment of wholly or partially electrically operated hardware has the risk that such hardware can easily be opened by using weaknesses in the electrical components.

Decision:
It is possible to certify electric or electronic operated hardware.
Requirements for the electric and/or electronic aspects of electrically operated hardware are listed below.
They also include requirements to the content of the assembly instructions, as well as requirements regarding the electrically operated hardware (whether an integral part of the product or not)

General requirements for electromechanical hardware.

1. The mechanical part of the product must satisfy the burglar resistance requirements as prescribed in NEN 5089, depending on the class: * / ** / ***

2. Power supplies of the locking system;

SKG * Both active power (lock closes at power loss) and passive power (lock opens at power loss) principle is permitted.

SKG ** passive power (lock opens at power loss) principle is permitted, provided an alert takes place and an emergency supply is automatically applied which remains active during at least 24 hours.
The emergency supplies may be overruled by the fire alarm!

SKG *** passive power (lock opens at power loss) principle is permitted, providing that alert takes place **to a Private Alarm Central (PAC)** and an emergency supply is automatically applied which remains active during at least 24 hours. The emergency supplies may be overruled by fire alarm!

3. The product should have an electrical diagram in which the conditions for burglar resistance are described.

4. The control unit c.q. operating unit, incl. the authorization must be located in the protected zone, unless it can withstand a burglar resistance test equal to the class requested, as described in NEN 5089.

5. The control unit c.q. operating unit, incl. the authorization must have an average theoretical manipulation time of at least: 6 / 24 / 48 hours. (for respectively. 1, 2 and 3 stars.
This is calculated by multiplying the maximum number of codes of the unit divided by the read speed (the number of possible codes per hour), divided by 2.

6. It must be impossible to manipulate the signal from the reader *) to the control unit c.q. operating unit.
a. wired system: The wiring should not be accessible on a level equal to the resistance class, unless the signal is encrypted, in accordance with the requirements as described in par. 5.
b. wireless system: The signal may not be reproducible. This must be made plausible by the provider (e.g. rolling code. See also the requirement to as described in par. 5).

7. The reader *) must satisfy:
a. When used in the non-protected zone: The identification class: 1 / 1 / 2 of EN 50133-1 + A1 (see also 15: Further requirements to keypads)
b. When used in the protected zone: The identification class: 0 of EN 50133-1 + A1, provided that no external manipulation is possible.

8. In case of outside application the reader *) should meet class IP 55 of IEC 60529

Requirements regarding the content of the installation instructions for products supplied without electronic control and / or products with separate (afterwards) to be mounted control options.

9. The control unit c.q. operating unit, including the authorization, from which the opening- or closing signal is generated should be installed in the secured zone.

10. The control wires in a wired system should be located in the secured zone.

11. The control unit c.q. operating unit, incl. the authorization must have an average theoretical manipulation time of at least: 6 / 24 / 48 hours. (for respectively. 1, 2 and 3 stars.
This is calculated by multiplying the maximum number of codes of the unit divided by the read speed (the number of possible codes per hour), divided by 2.
Please contact your supplier when in doubt.

12. It must be impossible to manipulate the signal of the reader *) to the control unit c.q. operating unit.
a. wired system: The signal should be encrypted.
b. wireless system: The signal may not be reproducible. see 11.

13. The reader *) must satisfy:
a. When used in the non-protected zone: The identification class: 1 / 1 / 2 of EN 50133-1 + A1 (see also 15: Further requirements to keypads)
b. When used in the protected zone: The identification class: 0 of EN 50133-1 + A1, provided that no external manipulation is possible.

14. In case of outdoors application the seals of the reader *) should meet class IP 55 of IEC 60529

15 **Further requirements to keypads.**

A: Minimum number of codes depends on the number of potential users with their own code;

Number of potential users with **personal** code	Minimum length of code	Number of codes
1 thru 3	4 positions	10^4 = 10.000
4 thru 30	5 positions	10^5 = 100.000
> 30	6 positions	10^6 = 1.000.000

B. Privacy protected (privacy shield) and installed in such a way that no more than 50% of the keypad is visible from a point above a horizontal plane 1000 mm above ground level.

The protection must be sustainable and may not be easily dismantled (bonding or one-way screws).

* Reader / receiver, e.g.: Key code- , IR , radiofrequency , proximity- or biometric.

2.07 Additional toolset according NEN 5096 and NEN 5089

CvD decision: 08-12-09

Introduction:

The manual test is performed with the toolsets as mentioned in NEN 5096.
The additional toolset in NEN 5096 mentions in general terms:
“Steel wire” , “Adhesive tape” and “String”.
In a normative annex G photos of these items are shown.

Decision:

“Steel wire” , “Adhesive tape” and “String” can be anything that is easy to get, costs almost nothing and needs no preparation. The steel wire with a maximum diameter of 4mm.

It is not allowed to prepare the available means in advance.
If preparing is an option it must be done as part of the attack time and only with the tools of the additional toolset.

2.08 Padlocks

Decision: B09-15 d.d. 27-08-09

Padlocks are not part of NEN 5089 hardware but are possible to certify:
Requirements and test methods:

2.08.a Product requirements and test methods

Class "1-star"
Padlocks in the class "1 star" must satisfy Grade 3 of EN 12320.
Class "2-star"
Padlocks in the class "2 star" must satisfy Grade 4 of EN 12320 and the additional product requirements as described below.
Class "2-star"
Padlocks in the class "3 star" must satisfy Grade 5 of EN 12320 and the additional product requirements as described below.

Additional Product Requirements:
Apart from the product requirements mentioned above that refer to a class in EN 12320, padlocks must also satisfy the following additional requirements.
Explanation:
The following requirements are based on the requirements set for (pad)locks intended for application as theft prevention for two-wheeled vehicles. These requirements were drawn up by the ART Foundation.

Design requirement
The direct key code must not be displayed on the key.
The product must be indelibly marked with a trademark or logo of the certificate holder and the burglary resistance identifying mark of the certification institution (See Section 4)

Performance requirement: Durability
The manufacturer must declare that certified padlocks still function well after completing 5,000 opening and closing cycles. This will also take account of the maintenance instructions. These maintenance instructions must conform to what is reasonably usual in practice.
Testing method: Establishing presence of manufacturer's declaration.

Performance requirement: Corrosion resistance.
Padlocks must conform to Grade 3 of EN 1670 and be tested according to para. 5.6 of this norm (salt-spray test). During the test, the padlock must be positioned as unfavourably as possible in the judgment of the certification institution.
After testing, the padlock must still satisfy the conditions of acceptation as described in par. 5.7 of EN 1670.
After testing, the lock must still be operable with a maximum moment of 2.5 Nm and with the correct key. For this it is permitted to spend 2 minutes making the padlock work using hand power and the correct key only.
Assessment must take place within 10 minutes of the end of the salt-spray test.

Performance requirement: Frost resistance (only for the classes 2 star and 3-star)
Padlocks must continue to function normally after the freezing test.
For this, a new padlock is submerged in water (depth: approx. 20 cm) for 30 sec. and then shaken by hand. It is then allowed to drain for 1 hour and next stored in a freezer at a temperature of $-20^{O}C \pm 3\ ^{O}C$ for 2 hours.
After this, the lock must still be operable with a maximum moment of 1.5 Nm and with the correct key. For this it is permitted to spend 2 minutes making the padlock work using hand power and the correct key only.
Assessment must take place within 5 minutes of removing the padlock from the freezer at a temperature of $+20^{O}C \pm 3^{O}C$.
Performance requirement: Resistance to cutting through of the shackle.
In the case of testing in accordance with 5.4.7 of EN 12320, in grade 4 a cutting force of 55 kN must be used (instead of the 35 kN stated) and in grade 5 a cutting force of 80 kN (instead of the 70 kN stated).

Performance requirement: resistance to manual testing

Padlocks must be capable of withstanding a manual assault with the tools shown in appendix 3.

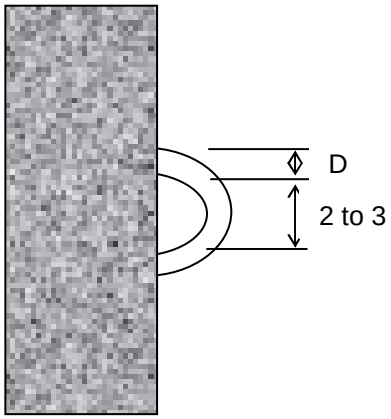
After studying (an exploded view of) the product and possibly after conducting a number of orientating preliminary tests to be determined by the laboratory, a main test will be carried out. For this, a choice will be made of the tools available.

In this respect, padlocks must be able to offer resistance for 3 minutes to an assault with the set of tools relevant to the class as stated in appendix 3.

For this, the padlock will be hung freely from a sufficiently solid fixed ring. This solid ring is fixed to a vertical concrete wall. The size and quality of the ring will correspond to the shackle of the padlock.

There are various rings available for this purpose with thickness ranging upwards from D = 6,8,10,12 to 16 mm.

See the figure alongside.



The laboratory will choose which ring is to be used.

If the product consist of a combination of padlock and matching fittings the test will be carried out on that combination.

The criterion is that the padlock cannot be removed. (Of course, the ring itself will not be assaulted).

2.08.b Classification and designation

Padlocks that satisfy the class “1 star” will be indelibly marked with the burglary resistance identifying mark of the certification institution featuring one star (★) within the mark and class in accordance with EN 12320 under it.

Padlocks that satisfy the class “2 star” will be indelibly marked with the burglary resistance identifying mark of the certification institution featuring two stars (★★) within the mark and class in accordance with EN 12320 under it.

Padlocks that satisfy the class “3 star” will be indelibly marked with the burglary resistance identifying mark of the certification institution featuring three stars (★★★) within the mark and class in accordance with EN 12320 under it.

Example of SKG identifying marks:

The product certificate will contain a technical description of the padlock and state the class according to these assessment guidelines.

2.08.c Tools used in manual testing:

Category:	1-star	2-star
Set A (small tools)		
Scissors / reinf. rod 60 cm	X	X
Side cutting nippers GEDORE 8330-225	X	X
Waterpump nippers 40 cm	X	X
Sawblades HSS 12" 24 tpi	X 45 *)	X 90
Sawblades Tungsten 12"	X 30	X 60
Adjustable wrench 10"	X	X
Set of open end spanners 20 pcs GEDORE 1B	X	X
Set of screwdrivers 6 pcs GEDORE 154 S	X	X
Set of chissels (4 pcs) HABERO CVL	X	X
Bench hammer 500 gr.	X 90	X 90
Set B (mechanical lock picking tools)		
For tubular locks HPC - TLPC-B	X	X
Hand -picking set	X	X
Picking Pistol ILCO	X	X
Lock pick MBA - for disk cylinders	X	X
Set C (various tools for manipulation)		
Additional tools and equipment of ENV 1630	X	X
Set D (large tools)		
Cable pliers 60 cm Felco		X
Waterpump nippers 70 cm		X
Nail puller HABERO 50 cm		X
Slide hammer MIDLOCK		X
Pipe spanner GEDORE 175-4		X
Set E (battery powered tools)		
Battery drilling machine (max 9,6 Volt)		X
Drills HSS (up to 6 mm)		X
Drills Cobalt		X
Battery fret sawingmachine (max. 9,6 Volt)		X
Sawsblades HSS		X
Sawblades Stainless steel		X
Sawblades tungsten		X
Battery grinding machine (max. 7,2 Volt)		X
weels: abrasive cyt-off (thick 1mm, diam 100 mm)		X
Set F (electrical lock picking)		
Lock picking tool HPC EPG-1		X

*) Where a number is shown, this refers to the number of seconds for which this tool may be used.

2.09 Emergency and panic devices

Decision: B09-09 d.d. 09-04-09

Locks with an escape function can also bear the star symbol if they have proven to be burglar resistant.
Because these product can't (by definition) meet the requirement of being lockable from the inside the manipulation test (drilling a hole) shall not be performed.
Because these products are sensitive to manipulation the user must take extra care of this aspect.

Therefore a warning must be added immediate vicinity of the SKG sign in the form of:

The pictogram for escape routes or
An indication EN 179 or EN 1125.

Example of a pictogram for escape routes: