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Staatliche Versuchsanstalt

Elektrotechnik und Elektronik

FEDERAL INSTITUTE OF TECHNOLOGY
ELECTRICAL AND
ELECTRONIC ENGINEERING

EXPERTISE

TGM – VA EE 38712

Ball throwing safety for
LED-Luminaire
Series: CR2..

according to: DIN 57710-13/VDE 0710-13: 1981-05
DIN 18032-3:1997-04

Commissioned by:	Zumtobel Lighting GmbH.
Address:	A-6851 Dornbirn, Schweizer Straße 30
Order reached:	2021-02-22 / Order Nr. 90068983
Sign of order:	Mr. S. Krenn / Mr. T. Egle
Receiving of test sample(s):	18400 / 2021-02-10
Test period:	CW 06/2021
TGM-number:	166/21

1 Test order

As ordered we carried out the tests for ball throwing safe luminaires (DIN 57710-13/VDE 0710-13:1981-05) according to DIN 18032-3:1997-04 for the luminaire type CR2...

2 Test item

LED- Luminaires:

Series: CR2 ...

Type: CR2PL M17k-830 CH NB EVG E3 WH

Nominal voltage: 220-240 V, 0/50/60 Hz

Nominal current: 2,557 A

Nominal wattage: 1x120,4W

Weight: 8kg

Class: I

IP- Degree of protection: IP66

Mounting: direct mounting on ceiling, suspended from chains, solid fixings ceiling,
(see mounting accessories on page 11)

Series: CR2 ...

Type: CR2PL L35k-840 PC WB MWCF SP WH

Nominal voltage: 220-240 V, 0/50/60 Hz

Nominal current: 0,980 A

Nominal wattage: 1x222,7W

Weight: 15kg

Class: I

IP- Degree of protection: IP66

Mounting: direct mounting on ceiling, suspended from chains, solid fixings ceiling,
(see mounting accessories on page 11)

Series: CR2 ...

Type: CR2 M13k-840 PC NB MWCF WH

Nominal voltage: 220-240 V, 0/50/60 Hz

Nominal current: 0,375 A

Nominal wattage: 1x83,8W

Weight: 8kg

Class: I

IP- Degree of protection: IP66

Mounting: direct mounting on ceiling, suspended from chains, solid fixings ceiling,
(see mounting accessories on page 11)

Series: CR2 ...

Type: CR2 L35k-840 PC WB MWCF WH

Nominal voltage: 220-240 V, 0/50/60 Hz

Nominal current: 0,997 A

Nominal wattage: 1x222W

Weight: 15kg

Class: I

IP- Degree of protection: IP66

Mounting: direct mounting on ceiling, suspended from chains, solid fixings ceiling,
(see mounting accessories on page 11)



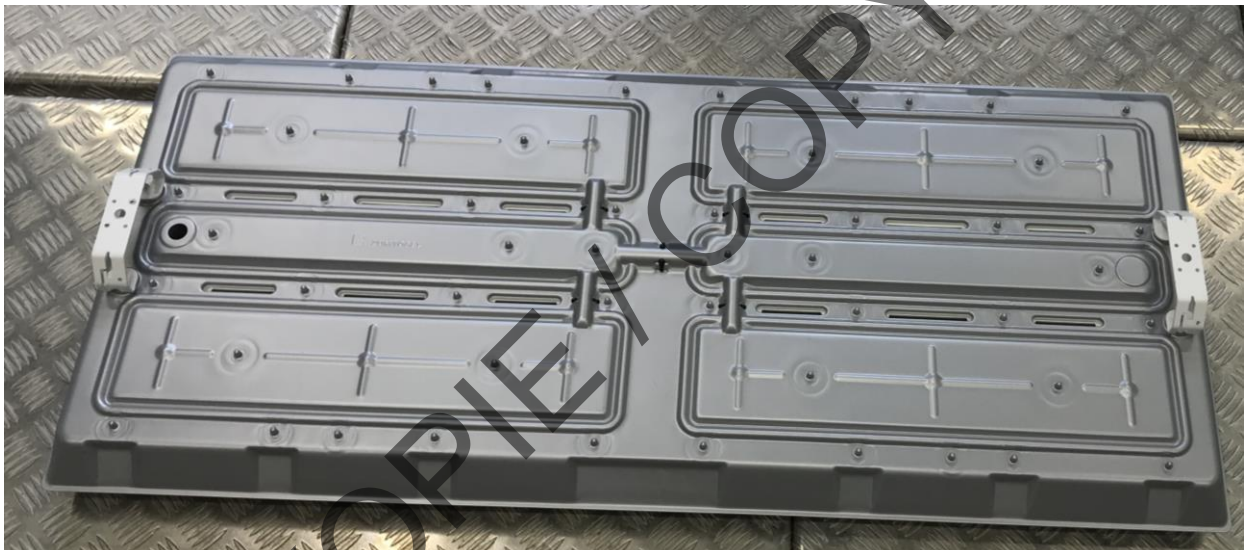
Picture 1: CR2PL M17k-830 CH NB EVG E3 WH



Picture 2: CR2PL L35k-840 PC WB MWCF SP WH



Picture 3: CR2 M13k-840 PC NB MWCF WH

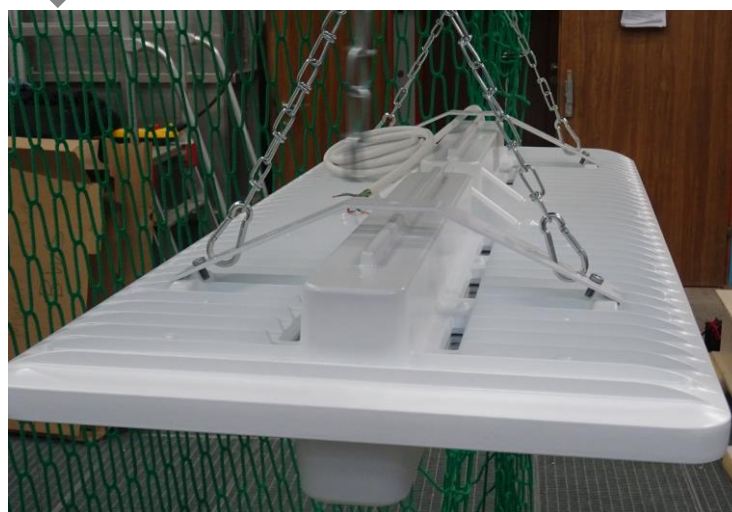


Picture 4: CR2 L35k-840 PC WB MWCF WH

Mounting accessories for CR2-series:



Picture 5: CR2PL L35k-840 PC WB MWCF SP WH – direct mounting on ceiling



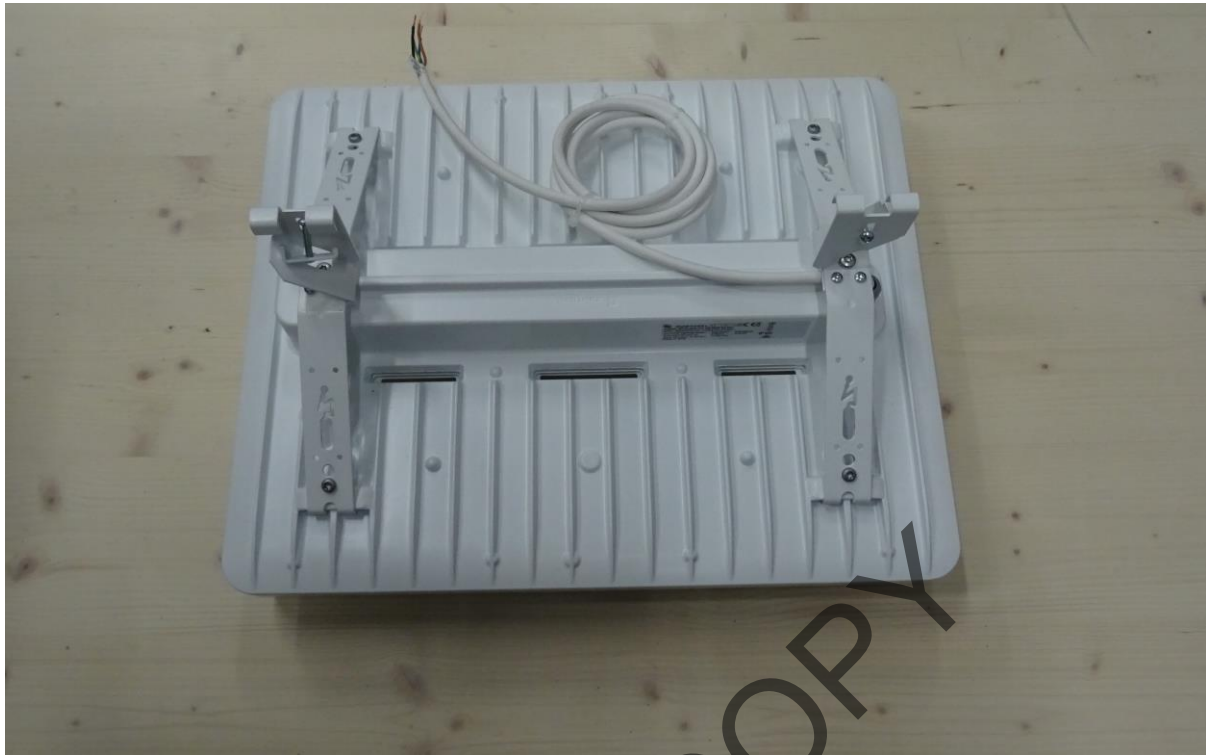
Picture 6: ceiling mounting, suspended from chains (CR2PL..)



Picture 7: CR2PL L35k-840 PC WB MWCF SP WH – ceiling mounting, on AD/AW set

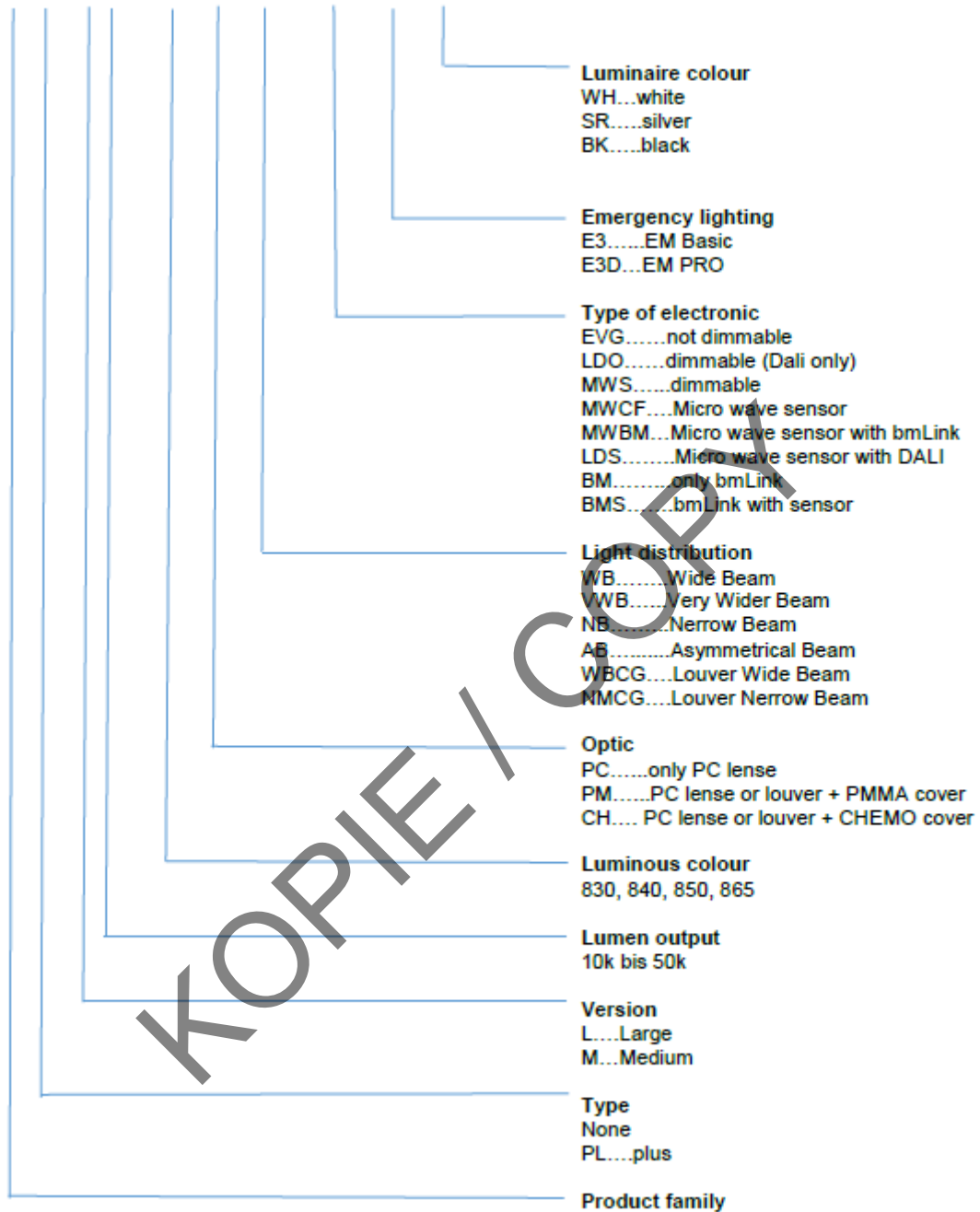


Picture 8: CR2PL M17k-830 CH NB EVG E3 WH – ceiling mounting, on M20 set



Picture 9: CR2PL M17k-830 CH NB EVG E3 WH and CR2PL L35k-840 PC WB MWCF SP WH
ceiling mounting, on ASP set

CR2** *****k-*** ** ***** ** **

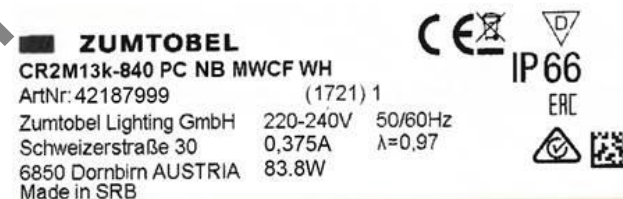
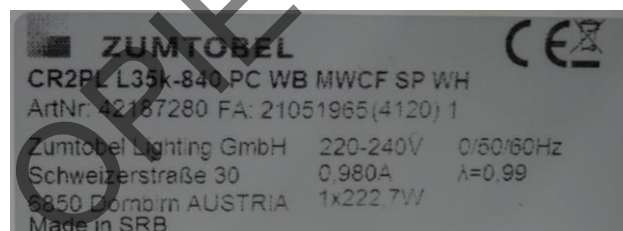
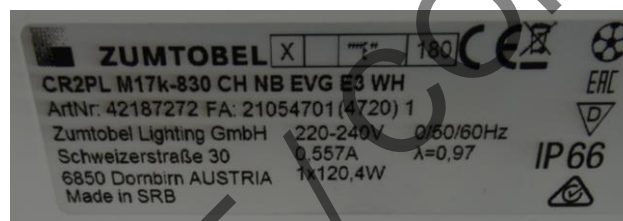


Picture 10: type code for CR2.. series

Article name	Item number	Item description
CR2 ZAK Set Length 1500	22171556	Kette / chain
CR2 M 1 Point Mounting ZAK Length 1500	22171559	1-Punkt Aufhängung M mit Kette / 1-point fixing M with chain
CR2 L 1 Point Mounting ZAK Length 1500	22171560	1-Punkt Aufhängung L mit Kette / 1-point fixing L with chain
CR2 & CR2PL ASP SET	22171561	Nordic solution
CR2PL AD/AW SET	22171562	AD/AW Set CR2PL (only ceiling mounting, no wall mounting)
CR2PL M20 SET	22171564	für Gewindestange M20 / for threaded rod (only for CR2PL)
CR2PL CEILING MOUNTING M	22171568	direkte Deckenaufhängung M CR2PL
CR2PL CEILING MOUNTING L	22171569	direkte Deckenaufhängung L CR2PL
CR2PL ZAK Set Length 1500	22171382	Kette / chain
CR2PL M 1 Point Mounting ZAK Length 1500	22171406	1-Punkt Aufhängung M mit Kette / 1-point fixing M with chain
CR2PL L 1 Point Mounting ZAK Length 1500	22171407	1-Punkt Aufhängung L mit Kette / 1-point fixing L with chain

Table 1: mounting accessories for CR2... series

3 Marking



Picture 11: marking / label

4 Test specifications and Results

Specifications during the test:

The tests were performed according to DIN 57710-13/VDE 0710-13:1981-05 (Luminaires with operating voltage below 1000V; luminaires safety to ball throwing) in conjunction with DIN 18032-3:1997-04 (Sport halls – Halls for gymnastics, games and multi-purpose use – Part 3: Testing of safety against ball throwing)

The luminaire was mounted direct on the ceiling with a holder or suspended on chains or on a mounting rack on an 10cm thick wooden plate on the ceiling; fixed with a mounting frame.

Luminaires tested with all optics and light distributions according to type code on page 10.

Ball throwing test apparatus: similar picture 1 of DIN 18032-3:1997-04

Handball:

mass: 430g

diameter: $\varnothing$ 187mm

overpressure: 1.2bar

impact speed: (16.5 ± 0.5) m/s

ball	shot - angle	shot quantity
Handball	90°	12
Handball	-60°	12
Handball	+60°	12

Table 2: luminaires safety to ball throwing – shot sequence

Results:

After the test: The test sample fulfils the requirements of EN 60598-1:2015 for the protection against electric shock (section 8: no access to live parts with the test finger) and the electric strength (section 10: high voltage test).

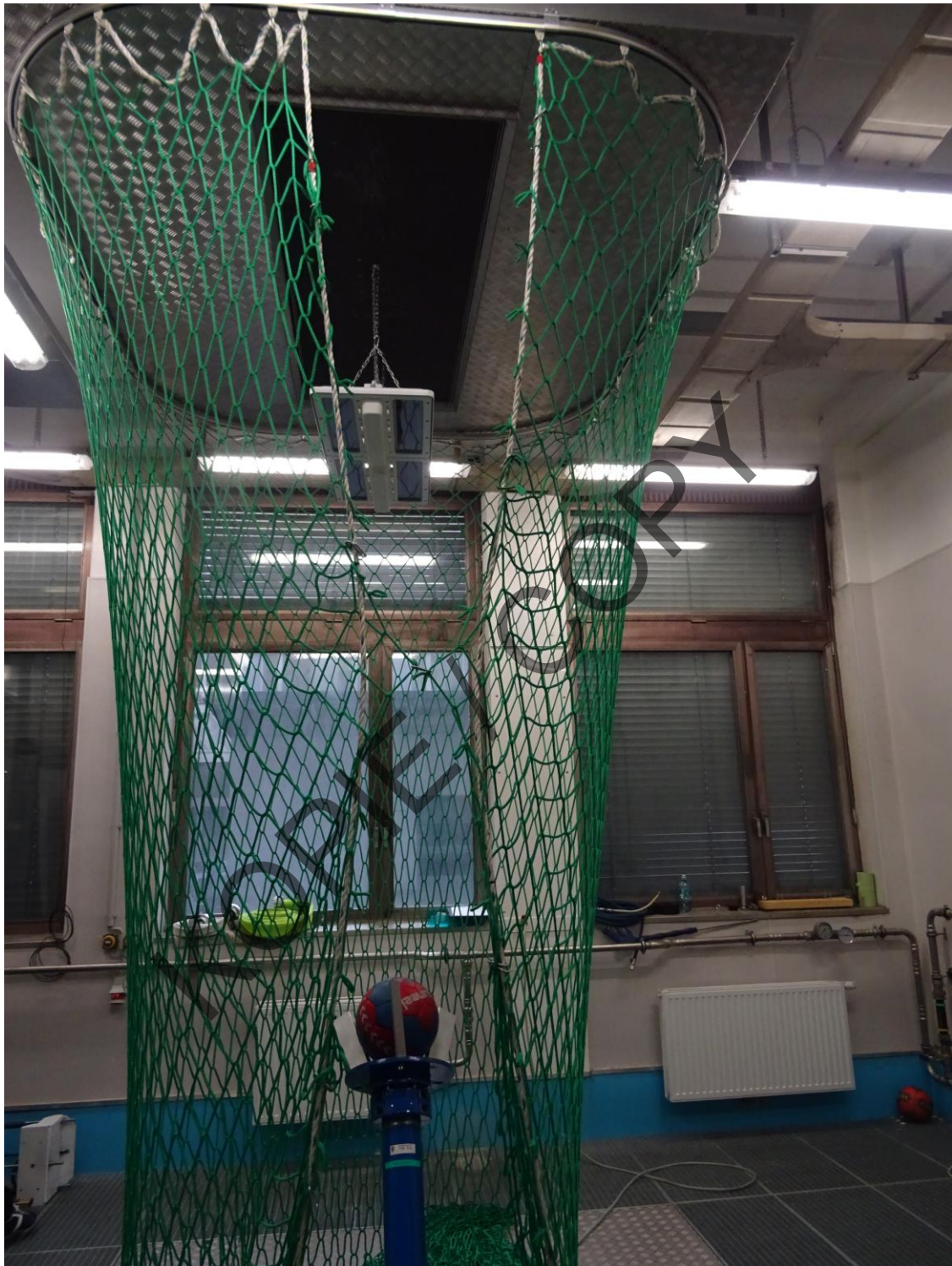
There was no damage according to DIN 57710-13/VDE 0710-13:1981-05 detected, particularly:

- No access to live parts.
- Effectiveness of isolation barriers is not reduced.
- No reduction of the IP-degree of protection against the ingress of dust, solid objects and moisture.
- Covers could be removed or replaced without damaging the cover or isolation.

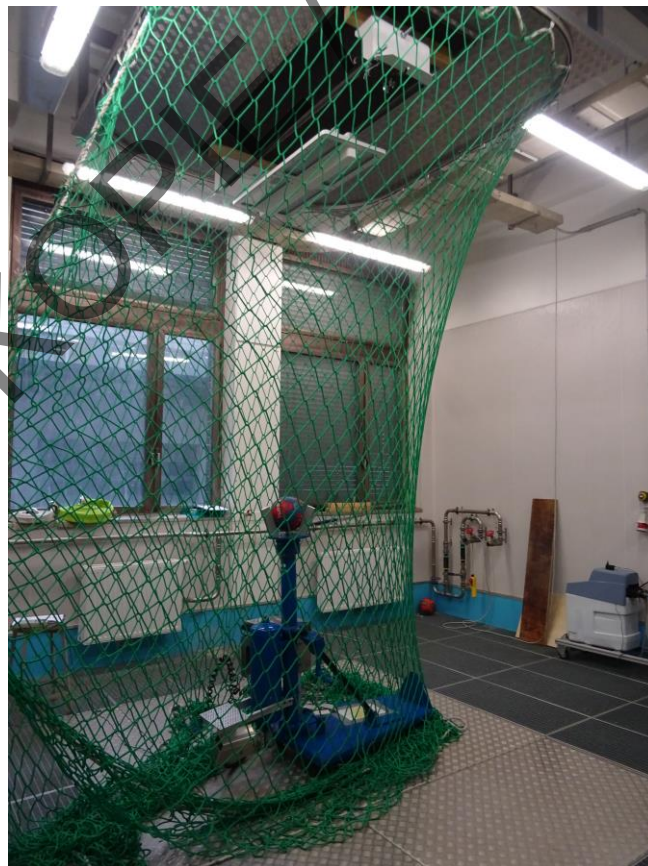
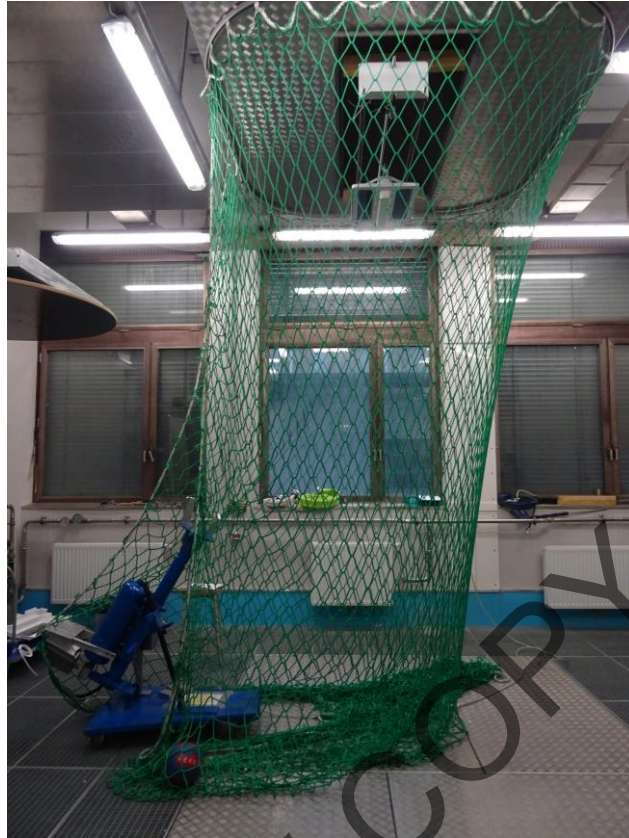
During the test no parts of the luminaire were falling down. The LED-modules shows no mechanical damage. The enclosure of the luminaire shows no damage which have an effect on the creepage distances and clearances. Deformation of the suspension was rated as insignificant.



Picture 12: ball throwing safety test on CR2PL M17k-830 CH NB EVG E3 WH
suspended from chains



Picture 13: ball throwing safety test on CR2PL L35k-840 PC WB MWCF SP WH
suspended from chains



Picture 14: ball throwing safety test on
CR2PL M17k-830 CH NB EVG E3 WH and CR2PL L35k-840 PC WB MWCF SP WH
built in in mounting frame



Picture 15: ball throwing tested lumianires

5 Summary

The test item described and pictured under clause 2 fulfils the requirements for ball throwing safe luminaires (DIN 57710-13/VDE 0710-13:1981-05) according to DIN 18032-3:1997-04. The test result relates to all luminaire versions of the CR2.. series, provided these are structurally identical to the tested luminaires (see type code).



The present report

is including 17 Pages
0 Appendix(es) (with 0 pages)

Official in charge: Stephan Prochaska
Ing. Dominic Litzka

Vienna, 2021-04-29



Ing. Dominic Litzka, BEd
Authorized Expert

Ing. Mag. Thomas Thun
Head of Department

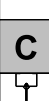
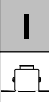
Prof. Ing. Gottfried Stelzl, MSc
Representing the testing- and inspection body

1. The test results recorded in this document refer exclusively to the test item described.
2. The documentation and material returned to the client have been marked when necessary by the Testing Institute as far as this is possible.
3. A third party will only be notified of the content of this document at the written agreement of the client.
4. The reproduction of excerpts from this document shall require the permission of the Testing Institute.

Bitte beachten Sie die möglichen Installationskonfigurationen und das BWS-Ergebnis.
Diese Tabelle ist auch in der Montageanleitung enthalten.

Please take into account the possible mounting configurations and the BWS result.
This table is also included in the mounting instruction.

Merci de tenir compte des possibles configurations de montage et du résultat BWS.
Ce tableau est aussi présent dans la notice de montage.

i MOUNTING OPTIONS									
	CR2PL M/L	ceiling/ wall	PC	PM	CH	BMxx	MWxx	E3, E3D E3D-UK	BWS 
A			✓	✓	✓	✓	✓	✓	
B			✓	✓	✓	✓	✓	✓	✓
C			✓	✓	✓	✓	✓	✓	
D			✓	✓	✓	✓	✓	✓	
E/O			✓	✓	✓				
F			✓	✓	✓	✓	✓	✓	 ✓
G			✓	✓	✓	✓	✓	✓	✓
H			✓	✓	✓	✓	✓	✓	✓
I			✓	✓	✓	✓	✓	✓	✓
K			✓	✓	✓	✓	✓	✓	✓
N			✓	✓	✓				✓  page 15!

CRAFT 2 PLUS

Bitte beachten Sie die möglichen Installationskonfigurationen und das BWS-Ergebnis.
Diese Tabelle ist auch in der Montageanleitung enthalten.

Please take into account the possible mounting configurations and the BWS result.
This table is also included in the mounting instruction.

Merci de tenir compte des possibles configurations de montage et du résultat BWS.
Ce tableau est aussi présent dans la notice de montage.

i MOUNTING OPTIONS								
CR2 M/L	ceiling/ wall	PC	PM	CH	BM MWBM	E3, E3D E3D-UK	BWS	
A 		✓	✓	✓	✓	✓	✓	⊘
B 		✓	✓	✓	✓	✓	✓	✓
C 		✓	✓	✓	✓	✓	✓	⊘
D 		✓	✓	✓	✓	✓	✓	⊘
E 		✓	✓	✓	⊘	⊘	⊘	⊘
F 		✓	✓	✓	✓	✓	✓	⊘
G 		✓	✓	✓	✓	✓	✓	✓
H 		✓	✓	✓	✓	✓	✓	⊘
I 		✓	✓	✓	✓	✓	✓	⊘
K 		✓	✓	✓	✓	✓	✓	✓

CRAFT 2 PERFORMANCE