



ITB CLASSIFICATION OF FIRE RESISTANCE

Number:	01468/21/Z00NZP/ENG	
Client:	Siniat Sp. z o.o. ul. Przeławska 8 03-879 Warszawa	Wotel Sp. z o.o. Sp. K. ul. Stoczniovców 1 30-709 Kraków
	Rockwool Polska Sp. z o.o. ul. Kwiatowa 16 66-131 Cigacice	
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Subject of classification:	Q <i>Ceiling</i> Floor	
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This document was issued in seven copies, of which two were dispatched to each Client and one remained in ITB.
This document shall be used or copied only as a whole.

1. Formal bases

- Order of Siniat Sp. z o.o., Wotel Sp. z o.o. Sp. K. and Rockwool Polska Sp. z o.o. on 2021-04-08.
- Contract № 01468/21/Z00NZP/ENG on 2021-04-28.

2. Technical bases

- [1] Standard PN-EN 13501-2:2016-07: Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.
- [2] Standard PN-EN 1365-2:2014-12: Fire resistance tests for loadbearing elements -- Part 2: Floors and roofs.
- [3] Standard PN-EN 15725:2010: Extended application reports on the fire performance of construction products and building elements
- [4] Standard PN-EN 1993-1-1 Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings.
- [5] Report № LZP01-01468/21/Z00NZP – QCeiling floor. Steel modular system floor. Dimensions of 3640×3670 mm, bottom panelling: 12.5 mm Nida Cicha plasterboard + 3 × 12.5 mm Nida Ogień Plus GKF plasterboard. Fire resistance test. Exposure from the bottom. ITB 2021.
- [6] Report № LZP08-1060/14/R82NZP –Siniat EI120 service cover with dimensions of 200×200 mm and Siniat EI120 service cover with dimensions of 800×800 mm built-in in Siniat EI120 suspended ceiling with Nida Ogień Plus type DF 4×15 mm plasterboard cladding. Fire resistance test. Exposure from the bottom (plasterboards side). ITB 2016.
- [7] Report № LZP04-1060/14/R82NZP –EI60 service cover with dimensions of 200×200 mm and Siniat EI60 service cover with dimensions of 800×800 mm built-in in Siniat EI60 suspended ceiling with Nida Ogień Plus type DF 2×15 mm plasterboard cladding. Fire resistance test. Exposure from the bottom (plasterboards side). ITB 2016.
- [8] Report № LBO-302/12 –Nida Sufit DK/CD60/30 suspended ceiling, F Nida Ogień Plus plasterboard standalone structure, with thickness of 2×15 mm. Gryfit Lab 2012.
- [9] Report № LBO-116/10 –Nida Sufit DK/CD60/25 suspended ceiling Nida Twarda type DEFH1R plasterboard standalone structure, with thickness of 2×12.5 mm. Gryfit Lab 2010.
- [10] Report № LZP03-1060/14/R82NZP –Siniat EI30 service cover with dimensions of 200×200 mm and Siniat EI30 service cover with dimensions of 600×600 mm built-in in Siniat EI30 suspended ceiling with Nida Ogień Plus type DF 2×12.5 mm plasterboard cladding. Fire resistance test. Exposure from the bottom (plasterboards side). ITB 2016.
- [11] Technical documentation provided by the Clients.

3. Subject and scope of classification

This classification concerns with fire resistance of *QCeiling* system horizontal partitions occurring between volumetric modules stacked in storeys manufactured by Wotel Sp. z o.o. Sp. K. Bottom partition of top module in conjunction with top partition of bottom module form a floor which is the subject of this classification. Partitions of modules in separation are not subject of this classification.

4. Technical description of product

4.1. General information

QCeiling floor manufactured by Wotel Sp. z o.o. Sp. K. consists of the following parts:

- 1) load-bearing structure:
 - a. steel ceiling frame (bottom frame, unloaded)
 - b. steel flooring frame (top frame, load-bearing)
- 2) internal insulation – insulation in the form of mineral rock wool in the void between beams of ceiling and flooring frames,
- 3) ceiling and flooring frames panelling.

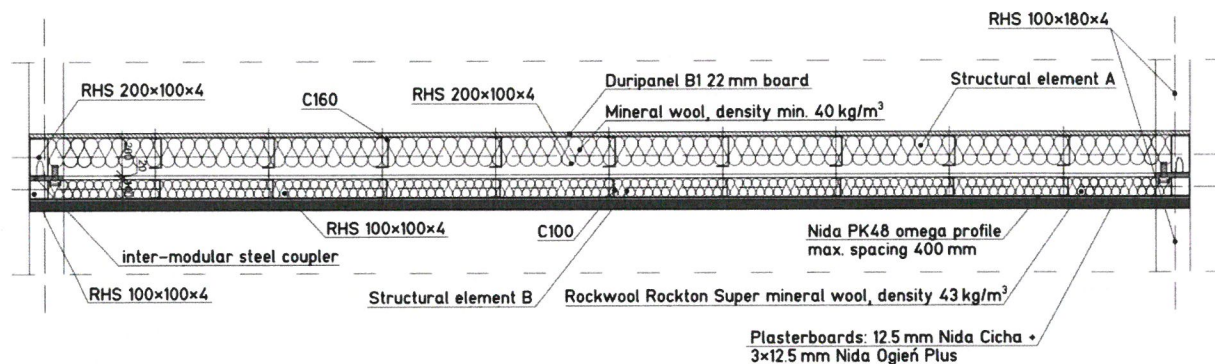


Fig. 1. Design of *QCeiling* floor

4.2. Load-bearing structure

4.2.1. Load-bearing structure of a module

The load-bearing structure is a steel structure manufactured by Wotel Sp. z o.o. Sp. K., designed according to PN-EN 1993-1-1 [4] standard.

The load-bearing structure is made of S235 grade steel and is optionally painted with anticorrosive *Hempel* system paint. The load-bearing structure consists of:

- 1) flooring module (top frame):
 - a. circumferential frame made of RHS 200×100×6 beams,
 - b. beams with minimal section of C 200×100×6 spaced up to 600 mm and maximal length of 3840 mm,
- 2) ceiling module (bottom module frame):
 - a. circumferential frame made of RHS 100×100×4 beams,
 - b. beams with minimal section of C 100×50×4 spaced up to 600 mm and maximal length of 3840 mm.

Floor beams in modules are butt-welded to circumferential frames of modules, however modules are not fixed together by welding. The frame of top module rests on the frame of the bottom module, the stability of connection is provided by pins of the bottom module frame placed in corners of the frame, which go into appropriate sockets in the frame of top module.

4.2.2. Intermediate structure for mounting of ceiling panels

Mounting of ceiling panels to the load-bearing steel beam structure is realised with a substructure made of *Nida PK 15×48* or *Nida MFCC50* omega-profiles manufactured by Siniat Sp. z o.o., placed perpendicularly to the length of the beams in maximal spacing of 400 mm. An omega-profile is mounted to the truss beams with 4.2×13 mm self-tapping screws of *Flat Head* type manufactured by Siniat Sp. z o.o. (at least 2 pieces per mounting node). Boundary omega-profiles may be spaced from the edge of the wall maximally by 50 mm.

4.3. Thermal insulation

The thermal insulation of ceiling and flooring modules is made in the form of *Rockwool Rockton Super* mineral rock wool boards manufactured by Rockwool Polska Sp. z o.o., with minimal density of 40 kg/m³ or other board-like products made of mineral rock wool with minimal density of 40 kg/m³ and minimal thickness of 100 mm.

4.4. Panelling

4.4.1. Flooring panels

The following products are used as flooring panels (top surface of flooring frame):

Duripanel B1 cement-bonded particleboards manufactured by Siniat Sp. z o.o.,

- with minimal thickness of 22 mm,
- with maximal dimensions of 1250×3100 mm,
- gaps between panels up to 2 mm,
- fixed with (alternatively):
 - 4.2×30 mm *Hydropanel* screws for 2.0 mm steel in maximal 300 mm spacing,
 - 3.5×50 mm *Nida Twarda* screws for 2.0 mm steel in maximal 300 mm spacing.

Thickness of structural cement-bonded particleboards shall be established individually depending on design loads and support spacing, based on technical opinion for structural cement-bonded particleboards manufactured by Siniat Sp. z o.o.

Interchangeably, the following panels may be used:

- *Duripanel Floor B1* cement-bonded particleboards manufactured by Siniat Sp. z o.o.:
 - with minimal thickness of 22 mm;
 - with maximal dimensions of 1250×3100 mm;
 - gaps between panels up to 3 mm;

- fixed with (alternatively):
 - 4.2×30 mm Hydropanel screws for 2.0 mm steel in maximal 300 mm spacing,
 - 3.5×50 mm Nida Twarda screws for 2.0 mm steel in maximal 300 mm spacing.
- Duripanel A2 cement-bonded particleboards manufactured by Siniat Sp. z o.o.:
 - with minimal thickness of 22 mm;
 - with maximal dimensions of 625×1250 mm;
 - gaps between panels up to 3 mm;
 - fixed with (alternatively):
 - 4.2×30 mm Hydropanel screws for 2.0 mm steel in maximal 300 mm spacing,
 - 3.5×50 mm Nida Twarda screws for 2.0 mm steel in maximal 300 mm spacing.
- Duripanel Floor A2 cement-bonded particleboards manufactured by Siniat Sp. z o.o.:
 - with minimal thickness of 22 mm;
 - with maximal dimensions of 625×1250 mm;
 - gaps between panels up to 3 mm;
 - fixed with (alternatively):
 - 4.2×30 mm Hydropanel screws for 2.0 mm steel in maximal 300 mm spacing,
 - 3.5×50 mm Nida Twarda screws for 2.0 mm steel in maximal 300 mm spacing.

Optionally, the following panels may be used as an additional top layer of the floor:

- *Hydropanel* cement-fibre boards manufactured by Siniat Sp. z o.o.:
 - with minimal thickness of 6 mm;
 - butt mounted;
 - joints finish with *Hydropanel PM Finisher* with *Hydropanel Strip* tape or cement *Hydropanel* boards glue.
- *Cementex* cement-fibre boards manufactured by Siniat Sp. z o.o.:
 - with minimal thickness of 6 mm;
 - butt mounted;
 - joints finish with *Hydropanel PM Finisher* with *Hydropanel Strip* tape or cement *Hydropanel* boards glue.

4.4.2. Ceiling panels

4.4.2.1. Variant I – REI 120

4.4.2.1.1 Panel type

Ceiling frame (bottom frame) shall be protected from the underside with plasterboards:

- **1st layer** (on structure side): *Nida Cicha* manufactured by Siniat Sp. z o.o.
 - DFH1IR type (according to EN 520)
 - with minimal surface density of 12.8 kg/m²

- with minimal thickness of 12.5 mm,
- **2nd, 3rd and 4th layer:** *Nida Ogień Plus* manufactured by Siniat Sp. z o.o.
 - DF type (according to EN 520),
 - with minimal surface density of 10.3 kg/m²
 - with minimal thickness of 12.5 mm.

4.4.2.1.2 Alternative boards

Interchangeably, the following boards may be used instead of *Nida Ogień Plus* (2nd, 3rd and 4th layer) (thickness, layer count and fixing as for *Nida Ogień Plus* boards):

- *Nida Woda Ogień* plasterboards manufactured by Siniat Sp. z o.o.: DFH2 type; minimal surface density of 13.5 kg/m², or
- *Nida Twarda* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.4 kg/m², or
- *Nida La Plura* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.8 kg/m², or
- *Nida Hydro* gypsum-fibre boards manufactured by Siniat Sp. z o.o.: GMFH1I type; minimal surface density of 13.5kg/m³.

4.4.2.1.3 Fixing

Abovementioned plasterboards are fixed to the omega-profiles (sec. 4.2.2) with:

- 1st layer: *Nida* ø3.5×25 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing (mounted to the substructure),
- 2nd layer: *Nida* ø3.5×45 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing,
- 3rd layer: *Nida* ø3.5×55 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing,
- 4th layer: *Nida* ø4.2×70 mm screws manufactured by Siniat Sp. z o.o.; in 150 mm spacing.

4.4.2.1.4 Joint filling and finishing

Joint filling of plasterboards edges is done with *Nida Max* gypsum putty manufactured by Siniat Sp. z o.o. (in the case of *Nida Hydro* gypsum-fibre boards *Hydromix* compound shall be used instead). The joints of the last layer are protected with the following tapes: *Nida* fibreglass tape, perforated *Nida* paper tape, *Connect* or *Comfort* tape manufactured by Siniat Sp. z o.o. The full-surface finish is done with the following gypsum compounds: *Nida Finish*, *Nida Duo*, *Nida Eco*, *Nida Optima*, *Nida Perfect*, *Nida Effect*, *Nida Excellence*, *Hydromix* or *Nida Pro* manufactured by Siniat Sp. z o.o.

4.4.2.2. Variant II – REI 60

4.4.2.2.1 Panel type – option A

Ceiling frame (bottom frame) shall be protected from the underside with plasterboards:

- **1st layer** (on structure side): *Nida Cicha* manufactured by Siniat Sp. z o.o.
 - DFH1IR type (according to EN 520)
 - with minimal surface density of 12.8 kg/m²
 - with minimal thickness of 12.5 mm,

- **2nd and 3rd layer:** *Nida Ogień Plus* manufactured by Siniat Sp. z o.o.
 - DF type (according to EN 520),
 - with minimal surface density of 10.3 kg/m²
 - with minimal thickness of 12.5 mm.

4.4.2.2.2 Panel type – option B

Ceiling frame (bottom frame) shall be protected from the underside with plasterboards:

- **1st layer** (on structure side): *Nida Cicha* manufactured by Siniat Sp. z o.o.
 - DFH1IR type (according to EN 520)
 - with minimal surface density of 12.8 kg/m²
 - with minimal thickness of 15 mm,
- **2nd layer:** *Nida Ogień Plus* manufactured by Siniat Sp. z o.o.
 - DF type (according to EN 520),
 - with minimal surface density of 10.3 kg/m²
 - with minimal thickness of 15 mm.

4.4.2.2.3 Alternative boards for options A and B

Interchangeably, the following boards may be used instead of *Nida Ogień Plus* (2nd and 3rd layer) (thickness, layer count and fixing as for *Nida Ogień Plus* boards):

- *Nida Woda Ogień* plasterboards manufactured by Siniat Sp. z o.o.: DFH2 type; minimal surface density of 13.5 kg/m², or
- *Nida Twarda* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.4 kg/m², or
- *Nida La Plura* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.8 kg/m², or
- *Nida Hydro* gypsum-fibre boards manufactured by Siniat Sp. z o.o.: GMFH1I type; minimal surface density of 13.5kg/m³.

4.4.2.2.4 Fixing – option A

Abovementioned plasterboards are fixed to the omega-profiles (sec. 4.2.2) with:

- 1st layer: *Nida* ø3.5×25 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing (mounted to the substructure),
- 2nd layer: *Nida* ø3.5×45 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing,
- 3rd layer: *Nida* ø3.5×55 mm screws manufactured by Siniat Sp. z o.o.; in 150 mm spacing,

4.4.2.2.5 Fixing – option A B

Abovementioned plasterboards are fixed to the omega-profiles (sec. 4.2.2) with:

- 1st layer: *Nida* ø3.5×35 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing (mounted to the substructure),
- 2nd layer: *Nida* ø3.5×55 mm screws manufactured by Siniat Sp. z o.o.; in 150 mm spacing,

4.4.2.2.6 Joint filling and finishing

Joint filling of plasterboards edges is done with *Nida Max* gypsum putty manufactured by Siniat Sp. z o.o. (in the case of *Nida Hydro* gypsum-fibre boards *Hydromix* compound shall be used instead). The joints of the last layer are protected with the following tapes: *Nida* fibreglass tape, perforated *Nida* paper tape, *Connect* or *Comfort* tape manufactured by Siniat Sp. z o.o. The full-surface finish is done with the following gypsum compounds: *Nida Finish*, *Nida Duo*, *Nida Eco*, *Nida Optima*, *Nida Perfect*, *Nida Effect*, *Nida Excellence*, *Hydromix* or *Nida Pro* manufactured by Siniat Sp. z o.o.

4.4.2.3. Variant III – REI 30

4.4.2.3.1 Panel type

Ceiling frame (bottom frame) shall be protected from the underside with plasterboards:

- **1st layer** (on structure side): *Nida Cicha* manufactured by Siniat Sp. z o.o.
 - DFH1IR type (according to EN 520)
 - with minimal surface density of 12.8 kg/m²
 - with minimal thickness of 12.5 mm,
- **2nd layer**: *Nida Ogień Plus* manufactured by Siniat Sp. z o.o.
 - DF type (according to EN 520),
 - with minimal surface density of 10.3 kg/m²
 - with minimal thickness of 12.5 mm.

4.4.2.3.2 Alternative boards

Interchangeably, the following boards may be used instead of *Nida Ogień Plus* (2nd layer) (thickness, layer count and fixing as for *Nida Ogień Plus* boards):

- *Nida Woda Ogień* plasterboards manufactured by Siniat Sp. z o.o.: DFH2 type; minimal surface density of 13.5 kg/m², or
- *Nida Twarda* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.4 kg/m², or
- *Nida La Plura* plasterboards manufactured by Siniat Sp. z o.o.: DEFH1IR type; minimal surface density of 15.8 kg/m², or
- *Nida Hydro* gypsum-fibre boards manufactured by Siniat Sp. z o.o.: GMFH1I type; minimal surface density of 13.5kg/m³.

4.4.2.3.3 Fixing

Abovementioned plasterboards are fixed to the omega-profiles (sec. 4.2.2) with:

- 1st layer: *Nida* ø3.5×25 mm screws manufactured by Siniat Sp. z o.o.; in 500 mm spacing (mounted to the substructure),
- 2nd layer: *Nida* ø3.5×45 mm screws manufactured by Siniat Sp. z o.o.; in 150 mm spacing,

4.4.2.3.4 Joint filling and finishing

Joint filling of plasterboards edges is done with *Nida Max* gypsum putty manufactured by Siniat Sp. z o.o. (in the case of *Nida Hydro* gypsum-fibre boards *Hydromix* compound shall be used instead). The joints of the last layer are protected with the following tapes: *Nida* fibreglass tape, perforated *Nida* paper tape, *Connect* or *Comfort* tape manufactured by

Siniat Sp. z o.o. The full-surface finish is done with the following gypsum compounds: *Nida Finish*, *Nida Duo*, *Nida Eco*, *Nida Optima*, *Nida Perfect*, *Nida Effect*, *Nida Excellence*, *Hydromix* or *Nida Pro* manufactured by Siniat Sp. z o.o.

5. Test reports analysis

Detailed descriptions of test specimens are enclosed in test reports [5-10]. Essential data used in the analysis¹ is shown in Table 1.

Table 1. Summary of test results

Report	Test specimen type; board count	Time of fire resistance for criterium of			Average temperature on ²	
		load-bearing capacity	integrity	insulation	boards	steel profiles
[5]	Floor; 12.5 mm DFH1IR plasterboard, <i>Nida Cicha</i> + 3×12.5 mm DF plasterboard, <i>Nida Ogień Plus</i>	121 min no failure	121 min	121 min no failure	flooring frame (top)	
					65°C at 90 min	90°C at 90 min
					65°C at 120 min	555°C at 120 min
					ceiling frame (bottom)	
240 °C at 90 min	170°C at 90 min					
at 120 min destroyed	at 120 min destroyed					
[6]	suspended ceiling 4×15 mm DF plasterboard, <i>Nida Ogień Plus</i>	n/a	155 min no failure	146 min	80°C at 120 min	85°C at 120 min
[7]	suspended ceiling; 2×15 mm DF plasterboard, <i>Nida Ogień Plus</i>	n/a	90 min no failure	90 min	100°C at 60 min	105°C at 60 min
					220°C at 120 min	220°C at 120 min
[8]	suspended ceiling; 2×15 mm F type plasterboard, <i>Nida Ogień Plus</i>	n/a	64 min no failure	63 min	115°C at 60 min	120°C at 60 min
[9]	suspended ceiling; 2×12.5 mm DEFH1IR plasterboard, <i>Nida Twarda</i>	n/a	50 min no failure	46 min	95°C at 30 min	no data
[10]	suspended ceiling; 2×12.5 mm DF plasterboard, <i>Nida Ogień Plus</i>	n/a	56 min no failure	54 min	95°C at 30 min	95°C at 30 min

¹ Siniat Sp. z o.o. granted a conditional permission to use [6–10] documents in order to complete this classification. The permission concerns with use of full-text of above mentioned documents exclusively for internal analysis of ITB, without possibility of further disclosure of these documents to parties which are not mentioned in these documents. Subsequent usage of the Siniat Sp. z o.o. documents is possible for validity period extension of this classification, without possibility to introduce any changes.

² Temperature was measured on the top surface of boards, except of “flooring frame (top)” in [5] in which case the temperature was measured on the bottom surface of panels.

6. Fire resistance classification

According to PN-EN 13501-2:2016-07 [1] floors are tested and classified with fire exposure from below.

On the basis of performed tests [5-10] and data analysis shown in sec. 5, *QCeiling* floors manufactured according to the description given in sec. 4 are classified according to criteria of PN-EN 13501-2:2016-07 [1] in the following classes:

6.1. Floors with ceiling panels compliant with sec. 4.4.2.1 (Variant I)

Fire resistance class: **REI 120**

6.2. Floors with ceiling panels compliant with sec. 4.4.2.2 (Variant II)

Fire resistance class: **REI 60**

6.3. Floors with ceiling panels compliant with sec. 4.4.2.3 (Variant III)

Fire resistance class: **REI 30**

7. Field of application

This classification remain valid for the field of application given in Table 2.

Table 2. Field of application

Subject of change		Range of change, field of application
Load per floor surface		$q_k \leq 4 \text{ kN/m}^2$ (normal conditions) or $\psi_{fi} q_k \leq 2.8 \text{ kN/m}^2$ (fire conditions)
Ultimate limit state in normal conditions	flooring beams	$\leq 55\%$
	ceiling beams	$\leq 45\%$
Flooring beams (top module)	beams height	$\geq 140 \text{ mm}$
	beams spacing	$\leq 600 \text{ mm}$ (axially)
Ceiling beams (bottom module)	beams height	$\geq 100 \text{ mm}$
	beams spacing	$\leq 600 \text{ mm}$ (axially)
PK48 omega-profile spacing		$\leq 400 \text{ mm}$ - perpendicularly to beams
Structural flooring panels		according to sec. 4.4.1.
Ceiling panels		according to sec. 4.4.2.

8. Expiration date and final remarks

This classification remain valid until 2024-06-29 and under the following conditions:

- no changes will be introduced to the testing method or classification standard
- no material or structural changes in assessed design will be introduced

This classification shall not be considered as a national technical approval/assessment, European technical approval/assessment or product certificate.

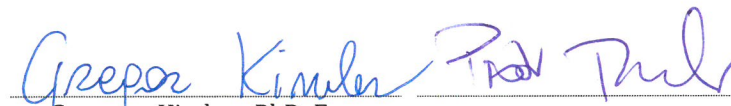
This document is an expert judgement within the meaning of PN-EN 15725:2010, cl. 3.13 [3].

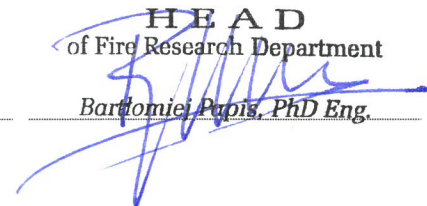
Validity period of this classification may be extended under condition that the application for extension will be placed at least 3 months prior to the expiration date.

Prepared by:

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Warszawa, 2021-06-29