

# Building Research Institute

00-611 WARSAW | FILTROWA 1 | phone: (48 22) 825 04 71, (48 22) 825 76 55 | fax: (48 22) 825 52 86

Member of the European Union for technical approval in construction –  
UEAtc  
Member of the European Organisation for Technical Assessment – EOTA

TECHNICAL APPROVALS

## ITB TECHNICAL APPROVAL AT-15- 9752/2016

In accordance to the Regulation of the Minister of Infrastructure of 8 November 2004 on the technical approvals and organisational units authorised to issue them (uniform text: Journal of Laws of 2014, item 1040), as a result of the approval proceedings performed at the Building Research Institute (Instytut Techniki Budowlanej) in Warsaw upon a request submitted by:

**RAWLPLUG S.A., Kwidzyńska 6, 51-416 Wrocław,**

we hereby confirm that the following product is suitable for use in construction:

### **RAWLPLUG polyurethane mortar**

under the conditions laid down in the Appendix hereto forming an integral part of this ITB Technical Approval.

Expiration date:  
15 October 2020

/Stamp:/

Building Research Institute

/Stamp:/

DIRECTOR  
of the Building Research Institute

Marcin M. Kruk, Ph.D. Eng. (-)

#### Appendix:

General and technical requirements

Warsaw, 28 October 2016

The document of ITB Technical Approval AT-15-9752/2016 consists of 12 pages. Contents of this document may only be copied in entirety. No publication or dissemination of any parts of this Technical Approval in any form whatsoever shall be permitted without written arrangement with the Building Research Institute.

## GENERAL AND TECHNICAL REQUIREMENTS

### TABLE OF CONTENTS

|                                                                                                                           |    |
|---------------------------------------------------------------------------------------------------------------------------|----|
| 1. OBJECT OF THE APPROVAL .....                                                                                           | 3  |
| 2. INTENDED USE, SCOPE AND CONDITIONS OF APPLICATION .....                                                                | 3  |
| 3. TECHNICAL PROPERTIES. REQUIREMENTS.....                                                                                | 4  |
| 3.1. Technical and operating properties of the RAWLPLUG polyurethane mortar<br>and joints developed using the mortar..... | 4  |
| 3.2. Expiration date .....                                                                                                | 6  |
| 4. PACKAGING, STORAGE AND TRANSPORT.....                                                                                  | 7  |
| 4.1. Packaging.....                                                                                                       | 7  |
| 4.2. Storage.....                                                                                                         | 7  |
| 4.3. Transport.....                                                                                                       | 7  |
| 5. ASSESSMENT OF CONFORMITY .....                                                                                         | 8  |
| 5.1. General principles .....                                                                                             | 8  |
| 5.2. Preliminary type testing .....                                                                                       | 8  |
| 5.3. Factory production inspection.....                                                                                   | 8  |
| 5.4. Testing of finished products.....                                                                                    | 9  |
| 5.5. Testing frequency .....                                                                                              | 9  |
| 5.6. Testing methods.....                                                                                                 | 9  |
| 5.7. Sampling for testing purposes .....                                                                                  | 10 |
| 5.8. Assessment of test results.....                                                                                      | 11 |
| 6. FORMAL AND LEGAL PROVISIONS.....                                                                                       | 11 |
| 7. EXPIRATION DATE.....                                                                                                   | 11 |

## **1. OBJECT OF THE APPROVAL**

The object of this ITB Technical Approval is polyurethane mortar marketed under the trade name of "RAWLPLUG polyurethane thin bed mortar" and is manufactured by RAWLPLUG S.A. based at Kwizdyńska 6, 51-416 Wrocław, intended for the construction of walls with thin joints, as per item 2.

The product known as RAWLPLUG polyurethane thin bed mortar is a one-component polyurethane foam supplied in pressurised containers intended for application by means of a foam gun or via a nozzle. Foaming of the product takes place at the application point, and once the application is completed, the mortar hardens as an effect of moisture absorption.

The required technical properties of the product subject to this Approval have been provided in item 3.

## **2. INTENDED USE, SCOPE AND CONDITIONS OF APPLICATION**

The RAWLPLUG polyurethane thin bed mortar is intended for use when constructing thin-joint walls made of the following materials:

- 1) refined and vertically perforated ceramic bricks of group 2 (with perforations of 25% to 55% of the brick volume), and an average compression strength of at least 15 N/mm<sup>2</sup>, of category I, characterised by the bed surface flatness deviation of no more than 0.3mm and the bed surface parallelism deviation of no more than 0.6mm, as per the PN-EN 771-1:2011 standard.
- 2) blocks made of autoclaved aerated concrete characterised by average compression strength of at least 4 N/mm<sup>2</sup> and the dimensional deviation category as for TLMB, conforming to the PN-EN 771-4:2012 standard, and the reservation that one should only use blocks of maximum bed surface flatness deviation not higher than  $\pm 0.3$ mm and maximum bed surface parallelism deviation not higher than 0.6mm.
- 3) calcium silicate vertically perforated tongue and groove bricks of group 1 (with perforations of up to 25% of the brick volume), and an average compression strength of at least 15 N/mm<sup>2</sup>. The dimensional deviation must conform to category T2, as per the PN-EN 771-2:2011 standard.

Surfaces of the masonry units on which the RAWLPLUG polyurethane mortar is applied should be free of any impurities reducing adherence and should be dampened with water (in the event that works are conducted at positive temperatures). Bricklaying should be performed when both the ambient temperature and the temperature of masonry units ranges between -5°C and +30°C.

Whenever bricks are laid at temperatures below 0°C, the mortar container temperature should be at least +20°C.

The RAWLPLUG polyurethane mortar is applied by means of a foam gun or a nozzle. The mortar should be laid in two beads, each with the width of 40 to 50mm, keeping the distance of approximately 3cm from the edge.

As for partition walls with a maximum thickness of no more than 12cm, it is permissible that the mortar be applied in a single bead of 40 to 50 mm in width along the wall axis.

When work is conducted at positive temperatures and, when using masonry units made of autoclaved aerated concrete, at negative temperatures, the open time (i.e. time for which mortar retains its gluing capacity) of the RAWLPLUG polyurethane mortar is 3 minutes. When working at negative temperatures using masonry units made of ceramics and calcium silicate, units should be joined directly after the mortar has been applied.

Alignment of the masonry units can only be adjusted if they are made of autoclaved aerated concrete and calcium silicate. The adjustment should be done within 3 minutes following the mortar application.

The conditions to prepare the RAWLPLUG polyurethane mortar for application as well as to apply it should be specified in the product manufacturer's instructions conforming with the requirements provided in this Approval.

During works, one should meet the requirements of the safe application of the RAWLPLUG polyurethane mortar, as provided by the manufacturer in the safety data sheet drawn up in accordance with Commission Regulation (EU) No.1907/2006 of the European Parliament and of the Council (as amended) concerning the registration, evaluation, authorisation and restriction of chemicals (REACH).

Whenever masonry structures are built in accordance with the requirements laid down in standard PN-EN 1996-1-1+A1:2013 using the RAWLPLUG polyurethane mortar, one should assume the technical parameters provided in Table 1 as well as partial safety factor  $\gamma_M$  of 2.2.

**Table 1.**

| Item                                                               | Specification                                                                                 | Wall made of hollow clay masonry units | Wall made of autoclaved aerated concrete blocks | Wall made of calcium silicate blocks |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------|--------------------------------------|
| 1                                                                  | 2                                                                                             | 3                                      | 4                                               | 5                                    |
| <b>Technical parameters to calculate wall compression strength</b> |                                                                                               |                                        |                                                 |                                      |
| 1                                                                  | Characteristic compression strength, MPa                                                      | $f_k = 3.2$                            | $f_k = 1.9$                                     | $f_k = 4.5$                          |
| 2                                                                  | Modulus of elasticity, MPa                                                                    | $E = 1,072$                            | $E = 184$                                       | $E = 1,689$                          |
| <b>Technical parameters to calculate wall bending strength</b>     |                                                                                               |                                        |                                                 |                                      |
| 3                                                                  | Characteristic bending strength in cases of failure in plane parallel to bed joints, MPa      | $f_{xk1} = 0.19$                       | $f_{xk1} = 0.22$                                | $f_{xk1} = 0.27$                     |
| 4                                                                  | Characteristic bending strength in cases of failure in plane perpendicular to bed joints, MPa | $f_{xk2} = 0.11$                       | $f_{xk2} = 0.19$                                | $f_{xk2} = 0.19$                     |
| <b>Technical parameters to calculate wall shear strength</b>       |                                                                                               |                                        |                                                 |                                      |
| 5                                                                  | Characteristic shear strength, MPa                                                            | $f_{vk0} = 0.08$                       | $f_{vk0} = 0.18$                                | $f_{vk0} = 0.31$                     |

### 3. TECHNICAL PROPERTIES. REQUIREMENTS.

#### 3.1. Technical and operating properties of the RAWLPLUG polyurethane mortar and joints developed using the mortar.

The technical and operating properties of the RAWLPLUG polyurethane mortar should comply with the requirements provided in Table 2, whereas properties of joints developed using this mortar with those in Table 3.

**Table 2.**

| Item | Properties                                                                                                | Requirements    |                             | Testing methods |
|------|-----------------------------------------------------------------------------------------------------------|-----------------|-----------------------------|-----------------|
|      |                                                                                                           | gun application | nozzle and hose application |                 |
| 1    | 2                                                                                                         | 3               | 4                           | 5               |
| 1    | Total density (including skin), kg/m <sup>3</sup>                                                         | 21 ± 10%        | 25 ± 10%                    | item 5.6.1      |
| 2    | Expansion, %                                                                                              | 135 ± 13        | 210 ± 20                    | item 5.6.2      |
| 3    | Changes in linear dimensions, %, after 24 h at +40°C and RH 90%, in:<br>- length and width<br>- thickness | ±2<br>±4        |                             | PN-EN 1604:2013 |
| 4    | Tensile strength, kPa                                                                                     | > 100           | > 150                       | PN-EN 1607:2013 |

**Table 3.**

| Item                                  | Properties                                                                                                                                                                                                        | Requirements | Testing methods                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------|
| 1                                     | 2                                                                                                                                                                                                                 | 3            | 4                                       |
| <b>Mortar application using a gun</b> |                                                                                                                                                                                                                   |              |                                         |
| 1                                     | Tensile strength (perpendicular to the gluing plane) of a joint in the ceramic hollow brick/polyurethane mortar/ceramic hollow brick setup, kPa:<br>• developed and kept for 24 hours under laboratory conditions | => 100       | PN-EN 1607:2013 and items 5.6.3 + 5.6.5 |
|                                       | • developed and kept for 24 hours at the temperature of -5°C                                                                                                                                                      | => 100       |                                         |
|                                       | • developed and kept for 7 days under laboratory conditions                                                                                                                                                       | => 120       |                                         |
|                                       | • developed and kept for 7 days at the temperature of -5°C                                                                                                                                                        | => 120       |                                         |
|                                       | • developed 3 minutes after the open time and kept for 24 h under laboratory conditions                                                                                                                           | => 120       |                                         |
|                                       | • developed and kept for 7 days under laboratory conditions, then subject to 20 freezing and defrosting cycles                                                                                                    | => 120       |                                         |

| Item | Properties                                                                                                                                                                                                                  | Requirements | Testing methods                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------|
| 1    | 2                                                                                                                                                                                                                           | 3            | 4                                       |
| 2    | Tensile strength (perpendicular to the gluing plane) of a joint in the autoclaved concrete block/polyurethane mortar/autoclaved concrete block setup, kPa:<br>• developed and kept for 24 hours under laboratory conditions | => 200       | PN-EN 1607:2013 and items 5.6.3 + 5.6.5 |
|      | • developed and kept for 24 hours at the temperature of -5°C                                                                                                                                                                | => 200       |                                         |
|      | • developed and kept for 7 days under laboratory conditions                                                                                                                                                                 | => 200       |                                         |
|      | • developed and kept for 7 days at the temperature of -5°C                                                                                                                                                                  | => 200       |                                         |
|      | • developed 3 minutes after the open time and kept for 24 hours under laboratory conditions                                                                                                                                 | => 200       |                                         |
|      | • developed 3 minutes after the open time and kept for 24 hours at the temperature of -5°C                                                                                                                                  | => 160       |                                         |
|      | • developed and kept for 24 hours under laboratory conditions, with the masonry unit position being adjusted after 3 minutes                                                                                                | => 200       |                                         |
|      | • developed and kept for 24 hours at the temperature of -5°C, with the masonry unit position being adjusted after 3 minutes                                                                                                 | => 160       |                                         |
|      | • developed and kept for 7 days under laboratory conditions, then subject to 20 freezing and defrosting cycles                                                                                                              | => 200       |                                         |

Table 3 (cont.)

| Item | Properties                                                                                                                                                                                                            | Requirements | Testing methods                         |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------|
| 1    | 2                                                                                                                                                                                                                     | 3            | 4                                       |
| 3    | Tensile strength (perpendicular to the gluing plane) of a joint in the calcium silicate block/polyurethane mortar/calcium silicate block setup, kPa:<br>• developed and kept for 24 hours under laboratory conditions | => 300       | PN-EN 1607:2013 and items 5.6.3 + 5.6.5 |
|      | • developed and kept for 24 hours at the temperature of -5°C                                                                                                                                                          | => 190       |                                         |
|      | • developed and kept for 7 days under laboratory conditions                                                                                                                                                           | => 300       |                                         |
|      | • developed and kept for 7 days at the temperature of -5°C                                                                                                                                                            | => 190       |                                         |
|      | • developed 3 minutes after the open time and kept for 24 hours under laboratory conditions                                                                                                                           | => 250       |                                         |
|      | • developed and kept for 24 hours under laboratory conditions, with the masonry unit position being adjusted after 3 minutes                                                                                          | => 250       |                                         |
|      | • developed and kept for 7 days under laboratory conditions, then subject to 20 freezing and defrosting cycles                                                                                                        | => 200       |                                         |

| Item                                                  | Properties                                                                                                                                                                                                        | Requirements | Testing methods                         |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------|
| 1                                                     | 2                                                                                                                                                                                                                 | 3            | 4                                       |
| <b>Mortar application using a nozzle with a straw</b> |                                                                                                                                                                                                                   |              |                                         |
| 4                                                     | Tensile strength (perpendicular to the gluing plane) of a joint in the ceramic hollow brick/polyurethane mortar/ceramic hollow brick setup developed and kept for 24 h under laboratory conditions, kPa           | => 120       | PN-EN 1607:2013 and items 5.6.3 + 5.6.5 |
| 5                                                     | Tensile strength (perpendicular to the gluing plane) of a joint in the autoclaved concrete block/polyurethane mortar/autoclaved concrete block setup developed and kept for 24 h under laboratory conditions, kPa | => 180       |                                         |
| 6                                                     | Tensile strength (perpendicular to the gluing plane) of a joint in the calcium silicate block/polyurethane mortar/calcium silicate block setup developed and kept for 24 h under laboratory conditions, kPa       | => 200       |                                         |

### 3.2. Expiration date

The product's expiration date should be stated on the packaging. The manufacturer guarantees that the RAWLPLUG polyurethane mortar shall retain all its technical properties as per item 3.1 within this period.

## **4. PACKAGING, STORAGE AND TRANSPORT**

### **4.1. Packaging**

The RAWLPLUG polyurethane mortar should be packed in the manufacturer's original tight containers protecting it against spillage and deterioration of the technical and operating properties.

Each item of packaging should be accompanied with at least the following information:

- manufacturer's name and address,
- product name as per this ITB Technical Approval,
- net volume or net volume and net weight,
- expiration date,
- storage and transport conditions,
- number of the ITB Technical Approval AT-15-9752/2016,
- number and date of issue of a domestic declaration of conformity,
- construction product marking.

The way the construction product marking should be affixed shall conform with the Regulation of the Minister of Infrastructure of 11<sup>th</sup> August 2004 on the methods for declaring conformity of construction products and marking them as construction products (Journal of Laws No.198/2004, item 204, as amended).

Furthermore, where separate regulations impose an obligation of marking the given product in accordance with the Regulation of the Minister of Health of 20<sup>th</sup> April 2012 on labelling of packaging containing hazardous substances and hazardous mixtures and some specific mixtures (uniform text: Journal of Laws of 2015, item 450) and Regulation No.1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No.1907/2006 (CLP), and on providing information on hazards to health and life resulting from safety data sheets based on Regulation (EC) No.1907/2006 (as amended) of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), the product should be accompanied by documentation of adequate form containing all the marking and information required under the applicable regulations.

### **4.2 Storage**

Product containers should be stored in a manner which secures the packaging against damage and the product itself against deterioration of technical and operating properties, as recommended by the manufacturer.

### **4.3 Transport**

Product containers should be transported in a manner which secures them against damage or destruction, as recommended by the manufacturer and with due regard to the applicable legal regulations concerning transport of such materials.

## **5. ASSESSMENT OF CONFORMITY**

### **5.1. General principles**

Pursuant to article 4, article 5, section 1, item 3 and article 8, section 1 of the act of 16<sup>th</sup> April 2004 on construction products (Journal of Laws No.92/2004, item 881, as amended), the product covered by this ITB Technical Approval can be traded and used in construction works in a scope corresponding to its operating properties and intended use provided that the Manufacturer has performed the conformity assessment procedure, issued a domestic declaration of conformity with ITB Technical Approval AT-15-9752/2016 and labelled the product with construction product marking in accordance with the applicable regulations in force.

Pursuant to the Regulation of the Minister of Infrastructure of 11<sup>th</sup> August 2004 on the methods for declaring conformity of construction products and marking them as construction products (Journal of Laws No.198/2004, item 2041, as amended), the assessment of conformity between the RAWLPLUG polyurethane mortar and the ITB Technical Approval AT-15-9752/2016 is to be performed by the Manufacturer by application of system 4.

Where system 4 is used for the conformity assessment purposes, the Manufacturer shall be entitled to issue a domestic declaration of conformity with ITB Technical Approval AT-15-9752/2016 based on the following grounds:

- a) preliminary type testing conducted by the Manufacturer or upon their commission,
- b) factory production inspection.

### **5.2 Preliminary type testing**

Preliminary type testing is a procedure intended to confirm the required technical and operating properties, conducted before the given product released to trade. Preliminary type testing comprises the following:

- a) changes in linear dimensions,
- b) tensile strength of joints in the masonry unit/RAWLPLUG polyurethane mortar/masonry unit system under different conditions of development and storage,
- c) characteristic compression strength of walls built using the RAWLPLUG polyurethane mortar,
- d) modulus of elasticity of walls built using the RAWLPLUG polyurethane mortar,
- e) characteristic bending strength (perpendicularly and in parallel to bed joints) of walls built using the RAWLPLUG polyurethane mortar,
- f) characteristic shear strength of walls built using the RAWLPLUG polyurethane mortar.

The tests which provided grounds for establishing the technical and operating properties of the product in question under the approval procedure function as the preliminary type tests under the conformity assessment.

### **5.3 Factory production inspection**

The factory production inspection system comprises the following:

- 1) specification and verification of raw materials and components,
- 2) in-production and finished product inspection and testing (item 5.4) conducted by the Manufacturer in accordance with a pre-arranged testing plan and as per the rules and procedures set forth in the factory production inspection documentation, adapted to the production technology and aimed at obtaining products of required properties.

The production inspection should prove that the product conforms with ITB Technical Approval AT-15-9752/2016. Results of the inspection should be recorded on a systematic basis. The relevant records should

confirm that the product in question complies with criteria of the conformity assessment. Individual products or product batches and the related manufacturing details must be fully traceable.

#### **5.4. Testing of finished products**

**5.4.1. Testing schedule.** The testing schedule comprises the following:

- a) in-progress testing,
- b) periodical testing.

**5.4.2. In-progress testing.** comprises verification of total density and expansion of the mortar.

**5.4.3. Periodical testing.** comprises verification of the following:

- a) changes in linear dimensions,
- b) tensile strength of the mortar,
- c) tensile strength of a joint in the ceramic hollow brick/polyurethane mortar/ceramic hollow brick setup developed and kept for 7 days under laboratory conditions,
- d) tensile strength of a joint in the autoclaved concrete block/polyurethane mortar/autoclaved concrete block setup developed and kept for 7 days under laboratory conditions,
- e) tensile strength of a joint in the calcium silicate block/polyurethane mortar/calcium silicate block setup developed and kept for 7 days under laboratory conditions.

#### **5.5 Testing frequency**

In-progress tests should be conducted in accordance with the testing schedule, but not rarer than as defined for testing of each product batch. The product batch size should be defined in the factory production inspection documentation.

Periodical tests should be conducted at least every 3 years.

#### **5.6 Testing methods**

Testing of the RAWLPLUG polyurethane mortar should comply with the requirements of the documents specified in Table 2, column 5.

Tests of properties of joints developed using the mortar in question should comply with the requirements of the documents specified in Table 3, column 4, on samples prepared according to descriptions provided in items 5.6.3 ÷ 5.6.5.

**5.6.1. Testing of apparent (total) density.** Tests are to be conducted using samples of free foamed product in unit sections of the bead of ca. 15cm in length and at least 30mm in diameter. Sections of the bead should be developed on a flat foil-covered surface. Samples should be left under foaming condition (inside a room with the temperature of  $23 \pm 2^{\circ}\text{C}$  and the relative air humidity of  $50 \pm 5\%$ ) for 14 days. After 14 days from foaming, each of the six samples (including the skin) is weighed with the accuracy of up to 0.01g to establish its mass  $m$ . Samples are one by one immersed in water-filled measuring cylinder graduated to  $10\text{cm}^3$  (initial water volume  $v_0$ ), and the volume increase is read ( $v_1$ ). Apparent density  $\rho$  is measured in  $\text{kg/m}^3$  according to the following formula:  $\rho = [m : (v_1 - v_0) \cdot 1000]$ . The test result is a mean of six measurements.

**5.6.2. Testing of foam height gain in a crack (expansion).** The foam height gain is tested by foaming the mortar inside a special mould, being a one metre long crack of 30 x 30mm in width and height. Two moulds (cracks) should be prepared for the test. Immediately after foam injection into one mould, another mould is placed on its surface, and after 24 hours from foam formation, the foam height is measured at a half of the mould length and in a distance of 10cm from the crack ends using a slide caliper of accuracy not inferior to 0.01mm. The foam height increase measurement result is compared with the original crack filling and stated in per cent. Before testing, both the foam container and the moulds are to be conditioned for 24 hours under laboratory conditions. The test result is the mean value obtained from at least three measurements.

**5.6.3. Preparation of samples under laboratory conditions.** Prior to testing, masonry units and the RAWLPLUG polyurethane mortar in the container seasoned for 24 hours under controlled laboratory conditions, i.e. in a room with the temperature of  $23 \pm 2^{\circ}\text{C}$  and the relative air humidity of  $50 \pm 5\%$ .

The surface of masonry units on which mortar is to be applied should be cleaned of all impurities which reduce adherence and dampened with water (e.g. using a wide brush). The mortar is applied by means of a foam gun or a nozzle.

The upper masonry unit is put against the lower masonry unit immediately after the mortar has been applied or, in the case of samples where the open time is taken into consideration, after the open time declared by the Manufacturer, whereas in the case of samples where adjustment of the masonry unit position is taken into consideration – after the time for adjustment, as declared by the Manufacturer.

The time for which samples must be kept before testing tensile and shear strength of joints has been specified in Table 3.

**5.6.4. Preparation of samples at the temperature of  $-5^{\circ}\text{C}$ .** Prior to testing:

- masonry units must be seasoned for 24 hours inside an environmental chamber at the temperature of  $-5^{\circ}\text{C}$ ,
- the RAWLPLUG polyurethane mortar in the container must be seasoned for 24 hours under controlled laboratory conditions, i.e. in a room with the temperature of  $23 \pm 2^{\circ}\text{C}$  and the relative air humidity of  $50 \pm 5\%$ .

The mortar is to be applied inside the environmental chamber at the temperature of  $-5^{\circ}\text{C}$ , as per the procedure defined in item 5.7.2 without dampening the element with water.

The time for which samples must be kept inside the environmental chamber before testing tensile strength of joints has been specified in Table 3.

**5.6.5. Preparation of samples subject to 20 cycles of freezing and defrosting.** The samples are prepared in accordance with item 5.6.3, and after keeping them for 7 days under laboratory conditions, they are subject to 20 cycles of freezing and defrosting, where each cycle comprises:

- decreasing the sample temperature from  $(20 \pm 2)^{\circ}\text{C}$  to  $(-15 \pm 2)^{\circ}\text{C}$  for 2 hours,
- keeping samples at the temperature of  $(-15 \pm 2)^{\circ}\text{C}$  for 4 hours,
- defrosting samples in water with the temperature of  $(20 \pm 2)^{\circ}\text{C}$  for 2 hours,
- keeping samples at the temperature of  $(20 \pm 2)^{\circ}\text{C}$  for 4 hours.

## **5.7. Sampling for testing purposes**

Samples for testing purposes are taken at random, as per the PN-N-03010:1983 standard.

#### **5.8. Assessment of test results**

A finished product is considered compliant with the requirements of this ITB Technical Approval if results of all tests are positive.

### **6. FORMAL AND LEGAL PROVISIONS**

**6.1.** ITB TECHNICAL APPROVAL AT-15-9752/2016 is a document which certifies that the RAWLPLUG polyurethane mortar is suitable for use in the construction industry within the scope of application matching the provisions hereof.

Pursuant to article 4, article 5, section 1, item 3 and article 8, section 1 of the act of 16<sup>th</sup> April 2004 on construction products (Journal of Laws no. 92/2004, item 881, as amended), the product covered by this ITB Technical Approval can be traded and used in construction works in a scope corresponding to its operating properties and intended use, provided that the Manufacturer has performed the conformity assessment procedure, issued a domestic declaration of conformity with ITB Technical Approval AT-15-9752/2016 and labelled the product with construction product marking in accordance with the applicable regulations in force.

**6.2.** The ITB Technical Approval does not infringe any rights arising from regulations on industrial property protection, and particularly of the Industrial Property Law of 30<sup>th</sup> June 2000 (uniform text: Journal of Laws of 2013, item 1410, as amended). Ensuring that the said rights are not infringed shall be the liability of the party using this ITB Technical Approval.

**6.3.** By issuing the Technical Approval, ITB assumes no responsibility for any potential infringement of exclusive and acquired rights.

**6.4.** The ITB Technical Approval shall not release the Manufacturer from any responsibility for sufficient quality of the RAWLPLUG polyurethane mortar or any building contractors from any responsibility for its proper use.

**6.5.** Brochures and publications as well as any other documents related to the trade of the RAWLPLUG polyurethane mortar and the application thereof in the construction industry shall contain information about the product in question being covered by ITB Technical Approval AT-15-9752/2016.

### **7. EXPIRATION DATE**

ITB TECHNICAL APPROVAL AT-15-9752/2016 expires on 15<sup>th</sup> October 2020.

The validity of the ITB Technical Approval may be extended if the Applicant or a legal successor thereof has submitted a suitable request to the Building Research Institute (ITB) along with the relevant application form not later than 3 months prior to the expiration date hereof.

**THE END**

## ADDITIONAL INFORMATION

### Related standards and documents

|                        |                                                                                                                                              |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| PN-EN 771-1:2011       | <i>Specification for masonry units. Part 1: Clay masonry units</i>                                                                           |
| PN-EN 771-2:2011       | <i>Specification for masonry units. Part 2: Calcium silicate masonry units</i>                                                               |
| PN-EN 771-4:2011       | <i>Specification for masonry units. Part 4: Autoclaved aerated concrete masonry units</i>                                                    |
| PN-N-03010:1983        | <i>Statistical quality control. Random sampling</i>                                                                                          |
| PN-EN 1604:2013        | <i>Thermal insulation products for buildings. Determination of dimensional stability under specified temperature and humidity conditions</i> |
| PN-EN 1607:2013        | <i>Thermal insulation products for buildings. Determination of tensile strength perpendicular to faces</i>                                   |
| PN-EN 1996-1-1+A1:2013 | <i>Eurocode 6. Design of masonry structures. Part 1-1: General rules for reinforced and unreinforced masonry structures</i>                  |

### Test reports, classifications and assessments

- 1) Study no. 00848/14/R05NK. Part I. *Identification properties, operating parameters of the product and freeze-thaw resistance of joints* along with Test Report no. LK01 -00848/14/R05NK. Building Research Institute. Department of Structures and Building Products. Warsaw, July 2015.
- 2) Study no. 00848/14/R05NK. Part II. *Technical opinion on technical properties of walls built with thin bed polyurethane mortar* along with Test Report no. LK02- 00848/14/R05NK. Building Research Institute. Department of Structures and Building Products. Warsaw, July 2015.