

All tests in this report are executed according to the ISO 9001 certified Quality management system of the BBRI.

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## TEST REPORT

<b>Laboratory</b>	<b>BUILDING CHEMISTRY (CH)</b>	<b>O/References</b>	DE-CH-0218 CH-20-106-03 Page 1/4
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<b>Requested by</b>	<b>Hevadex BV</b> Spinnerslaan 6 B-9160 Lokeren		
<b>Date of the order</b>	23/09/2020	<b>Sample registration</b>	S-2020-48-015
		<b>Date of reception of samples</b>	20/11/2020
<b>Date of issue of the report</b>	19/07/2021		
<b>Test carried out</b>	Determination of the CO <sub>2</sub> permeability of a protective coating of the type « <b>Isoproof FR</b> »		
<b>References</b>	NBN EN 1062-6 (2002)		

### Disclaimer

The laboratory is not responsible for the accuracy and completeness of the information contained in this report which has been provided by the customer. The sampling was not carried out by the laboratory and thus the results of this report apply only to the sample as received by the laboratory. The equivalence between the tested product covered by this report and the commercialised product lies entirely under the responsibility of the requestor.

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*No samples*  
 *Sample(s) subjected to destructive test*  
 *Sample(s) to be removed from our laboratories 30 calendar days after sending of the report, save in the case of a further written request.*

Technical responsible  
of the test



Julien Delaet

Responsible  
in charge of the test



E. Cailleux

Head of laboratory



P. Steenhoudt

## 1 INTRODUCTION

At the request of the company Hevadex BV, the laboratory of Building Chemistry of BBRI has determined the CO<sub>2</sub> permeability of a protective coating of the type « **Isoproof FR** ». These tests were performed according to the standard NBN EN 1062-6 (2002) method A.

## 2 RECEIPT OF THE SAMPLES

**Date of reception of the sample at BBRI:** 20/11/2020

**Conditioning after reception:** Climate chamber regulated at a temperature of 23±2°C and at a relative humidity of 50±5%

**Description :** One free film of a grey coating. The sample received the sample number S2020-48-015.

## 3 DETERMINATION OF THE CO<sub>2</sub> PERMEABILITY (NBN EN 1062-6: 2002)

### 3.1 *Methodology*

The test is carried out according to the method A (gravimetric method) of the standard NBN EN 1062-6. It consists in subjecting a film of the tested coating to a measuring gas constituted of a mixture of air and carbon dioxide. The concentration of carbon dioxide in the measuring gas is 10 ± 0.5%.

Before the beginning of the test, the specimens are dried over desiccant to constant mass. The samples are then sealed by means of paraffin to test cells which contain sodium hydroxide (carbon dioxide absorbent).

The test cells are placed in a test chamber (desiccator) connected to the measurement gas. The amount of carbon dioxide diffusing through the film over time is determined quantitatively by regular weighing. The test is completed when a stationary state is reached, namely when the mass increase does not vary over time. During the test, the cells are also maintained in a dry atmosphere with a relative humidity of less than 10 % and a temperature of 23±2°C.

In order to validate the measurements, the carbon dioxide permeability is also determined on a reference coating from the "KIWA Polymer Institute" whose properties are known.

### 3.2 *Preparation of the samples*

The samples (free films) used for the tests were produced by the requestor. The composition of the sample, the application and the drying conditions of the coating were not communicated to us.

Several specimens (coating discs) were cut in the free film provided. After this operation, these were placed from 27/11/2020 to 12/01/2021 in a desiccator containing a desiccant agent.

The dry thickness of each specimen was determined according to the standard NBN EN ISO 2808 (2019) by mechanical measurement following the method A4 (comparator with measuring table). Five measurements were at least performed on each specimen. The average values obtained are given in Table 1.



**Table 1 : Average dry thickness of the tested specimens.**

Specimen number	Average dry thickness ( $\mu\text{m}$ )	Standard deviation ( $\mu\text{m}$ )
CH0218-1	553	54
CH0218-2	623	29
CH0218-3	489	46
CH0218-4	495	60

### 3.3 Date of testing

The dates of the carbon dioxide permeability tests are given in Table 2.

**Table 2 : Dates of the carbon dioxide permeability test.**

Coating	Test dates
« Isoproof FR »	From 12/01/2021 to 25/01/2021
KIWA reference coating	

### 3.4 Results

The average values for the carbon dioxide permeability ( $V$ ), the equivalent air layer thickness ( $S_d$ ) and the diffusion resistance number ( $\mu$ ) determined for the tested coating are mentioned in Table 3.

The values obtained for the KIWA reference coating are given in Table 4. The standard NBN EN 1062-6 considers the measurements to be correct when the diffusion resistance number does not differ by more than 30% from  $1.75 \times 10^6$ , which is the case here.

The classification of  $\text{CO}_2$  permeability defined in the standard NBN EN 1062-1 (2004) is recalled in Table 5.

**Table 3: Results of the  $\text{CO}_2$  permeability tests performed with the coating « Isoproof FR »**

Laboratory number	Coating « Isoproof FR »		
	$\text{CO}_2$ permeability ( $i$ ) [ $\text{g}/(\text{m}^2 \cdot \text{d})$ ]	Equivalent air layer thickness ( $S_d$ ) [m]	Diffusion resistance number ( $\mu$ ) [-]
CH0218-1	3.123	79.6	1.44E+05
CH0218-2	2.436	101.9	1.64E+05
CH0218-3	2.936	84.6	1.73E+05
CH0218-4	3.218	77.2	1.56E+05
<b>Average value</b>	<b>2.928</b>	<b>85.8</b>	<b>1.59E+05</b>
<b>Standard deviation</b>	<b>0.348</b>	<b>11.2</b>	<b>1.24E+04</b>



**Table 4:** Results of the  $CO_2$  permeability tests performed with the KIWA reference coating

Laboratory number	KIWA reference coating		
	$CO_2$ permeability (i) [g/(m <sup>2</sup> .d)]	Equivalent air layer thickness ( $S_d$ ) [m]	Diffusion resistance number ( $\mu$ ) [-]
Reference 1	2.827	87.9	$1.83 \times 10^6$
Reference 2	2.750	90.3	$1.88 \times 10^6$
Reference 3	3.002	82.8	$1.72 \times 10^6$
<b>Average value</b>	<b>2.859</b>	<b>87.0</b>	<b>1.81E 10<sup>6</sup></b>
<b>Standard deviation</b>	<b>0.129</b>	<b>3.9</b>	<b>0.08E 10<sup>6</sup></b>

**4 ANNEX**
**Table 5:** Requirements for the  $CO_2$  permeability classes defined in NBN EN 1062-1 (2004)

Class	Requirement	
	i [g/(m <sup>2</sup> .d)]	$S_d$ [m]
<b>C0</b>	no requirements	
<b>C1</b>	< 5	> 50

