

Test Report P15-137.1e/2024

## **Determination of the Hemispheric Emissivity of a Interior Wall Coating**

Product: »COLOURS Reflection«  
Coating thickness 100 µm

Client:  
Aperto Homestyle Company S. L.  
Scharnhorststr. 3  
65195 Wiesbaden  
Germany

Stuttgart, April 24, 2024

## 1 Scope of Work

On March 6, 2024 the Aperto Homestyle Company S. L. commissioned the Fraunhofer Institute for Building Physics IBP, Stuttgart, to determine the thermal emissivity of an interior wall coating called »COLOURS Reflection« following the thermal measurement principle according to [1]. The emissivity describes the radiation behavior of a surface for thermal radiation. Standard building surfaces usually have emissivity values in the order of 0.9.

## 2 Material Under Test

The following test specimens were forwarded to Fraunhofer IBP to perform the tests:

Designation*:	Interior wall coating »COLOURS Reflection«
Type of sampling:	Delivery at the instigation of the client on April 18, 2024.
Construction:	Sample coating, colour white, on cardboard, background black/white.
Number, dimensions:	1 specimen, coated area 90 mm x 190 mm. coating thickness 100 µm*

\*) Information of the manufacturer

## 3 Determination of the emissivity

### 3.1 Test method

The emissivity of the test specimens was determined following the thermal measurement principle. Using this method, the sample surface was partially exposed to radiation through a hemisphere (diameter: 80 mm), which heated to a temperature of 100 °C. The reflected long-wave radiation was then measured by a sensor described in [1]. The measurements were based on the following boundary conditions:

Date:	Calendar week 17, 2024
Place:	IBP Radiation Lab
Measuring device:	Hemispheric black body radiator according [1]
Spectral range:	2.5 µm to 40 µm
Radiator temperature:	Setpoint temp. 100 °C, actual temp. 100.2 °C ± 0.3 K
Lab air temperature:	19.8 °C
Temperature of test specimen:	20.0°C
Number of individual measurements:	1 sample x 15 individual measurements on randomly selected locations
Reference standard:	No. 2012 0036/2 with $\epsilon = 0.016$ and 0.956 traceable to National Physical Lab (NPL)-Standard No. 194/95 and 195/95.

### 3.2 Test results

For the outer surface of the specimens, the following mean hemispheric emissivities  $\epsilon_i$  were determined:

$$\epsilon = 0.60$$

The value represents the arithmetic mean of the above-mentioned individual measurements, which were evenly distributed over the samples provided. The calculated standard deviation over all measurements was 0.010. An overall measurement uncertainty of  $\pm 0.03$  is assumed for the method.

Since the sample has no transmission in the sensitivity range of the method, the following thermal reflectance results from the measured emissivities with the relationship  $\rho = 1 - \varepsilon$  :

$$\rho = 0.40$$

## 4 References

- [1] DIN EN 15976:2011-07: Flexible sheets for waterproofing - Determination of emissivity; German version EN 15976:2011. Publisher Beuth, Berlin.

Note:

The results presented in this test report refer exclusively to the tested objects.

The present test report comprises 3 pages text.

Stuttgart, April 24, 2024/JL

Deputy Head of Department

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