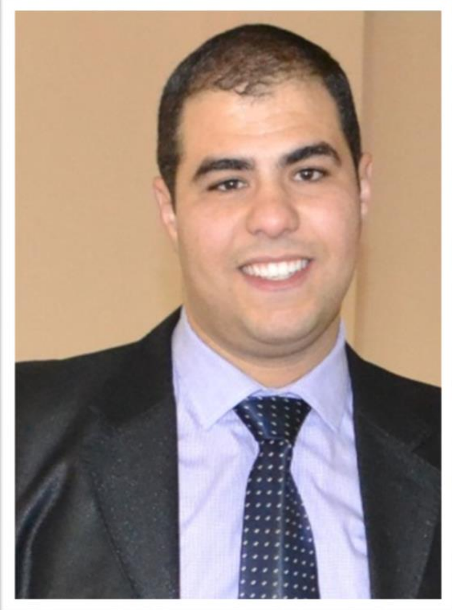

EXPERIMENTAL STUDY ON THE EFFECT OF THE EXTERIOR TEXTURE ON THE INTERIOR THERMAL COMFORT

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The building envelope is the first receiver of solar energy, it can be used through its materials and design elements to reduce energy consumption and improve indoor thermal comfort. Exterior siding is often used for aesthetic reasons. The texture of exterior cladding can be used to providing a solution for intrior thermal comfort. This study presents an experimentation on the effect of the exterior texture on the interior thermal comfort, the objective of this research is to evaluate the texture of the coating of the exterior envelope and its influence on interior thermal comfort, using the international standards like (ISO 9869) and the estimating the indoor thermal comfort by the operative temperature index -OT-. There are very few studies in the literature reviews which have mentioned and addressed the subject of the texture of the exterior envelope and its effect on the interior comfort of the building.

This study was carried out in the summer; the experiment consists of making test cells with different textures of exterior coatings. This survey opens up research for other similar studies for trials in different climatic zones.

KEYWORDS

Test cells, Coating texture, Thermal comfort, Solar radiation, Surface temperature, ISO 9869, Operative temperature.

PROBLEM

- How can we assess the indoor thermal comfort of the building through the texture of the coating of the exterior envelope.
- How can we make a measurement protocol that can evaluate this parameter through an experimental study.
- Which standard can help estimate indoor thermal comfort through the texture of the exterior cladding.
- What kind of building envelope strategies can best manage occupants' thermal comfort.

HYPOTHESIS

- The texture of the coating of the outer envelope has an effect on the interior thermal comfort of buildings.
- This effect can be identified through a measurement and field experimentation protocol.
- The standard (ISO 9869-Part 1: 2014) can help estimate interior thermal comfort through the texture of the exterior cladding.
- Indoor thermal comfort can be estimated by the operating temperature index -OT-.

OBJECTIVE

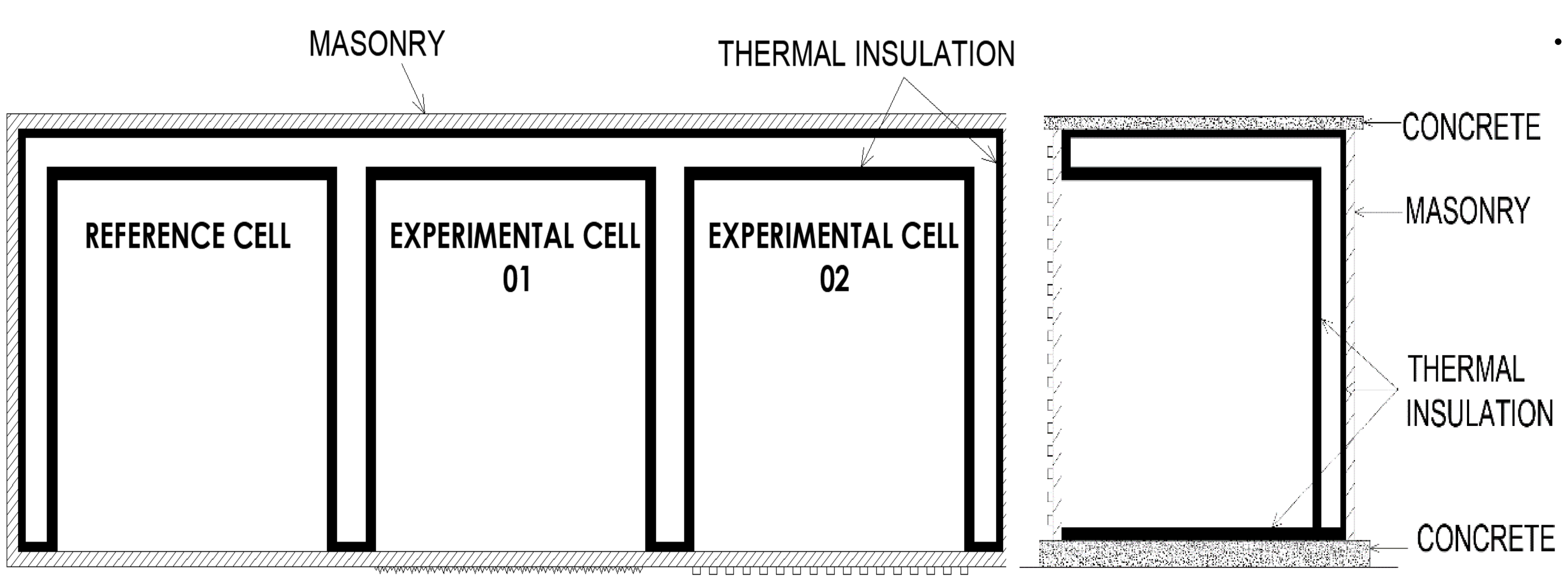
The objective of this study is to assess the thermal performance of walls with different textures of exterior coatings and its effect on interior thermal comfort using the average method developed in standards (ISO 9869-Part 1: 2014). and estimating the indoor thermal comfort by the operative temperature index -OT-.

ORIGINALITY

The first idea of this study started during the first test box already made which shows a difference in result between the different texture of the boxes.

TEST BOX

TEST CELL

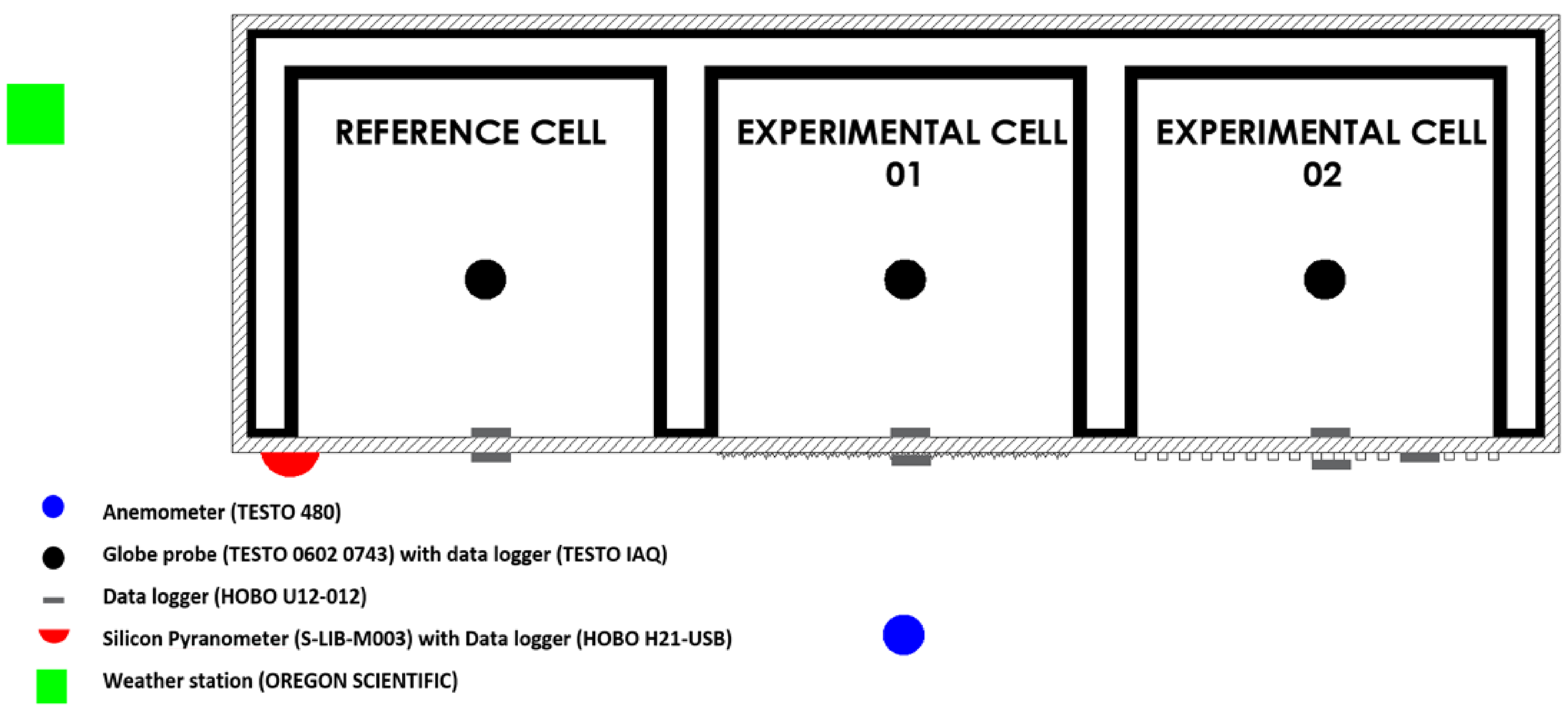


METHODOLGY

In this study, in situ measurements are carried out to assess the thermal performance of exterior cladding. the method specified in the international standard (ISO 9869-Part 1: 2014) is adopted to determine the thermal resistance and thermal transmittance in the different types of texture. The thermal performance parameters were calculated using the Average method developed in standards (ISO 9869-Part 1: 2014). An estimate of the indoor thermal comfort of the cells was calculated by the operative temperature index -Top-..

TEST CELLS AND TYPE OF TEXTURE STUDIED

EXTERNAL AND INTERNAL MEASURES



INSTRUMENTS AND MEASUREMENT PARAMETER

Measuring tool	Reference	Number	Measurement parameter
Multifunction anemometer	TESTO 480	01	Globe temperature Air temperature wind speed Specific humidity
Temperature globe sensors - diameter of 15 cm	TESTO 0602 0743	03	Globe temperature
Data Logger	TESTO IAQ	01	Globe temperature
Temperature and humidity sensors	HOBO U12-012	07	Surface temperature Air temperature Specific humidity
Pyranometers with Data logger	S-LIB-M003 (HOBO H21-USB)	01	Solar radiationre
weather station	OREGON SCIENTIFIC	01	various climatic parameters

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