

Determination of the Behavior under Freeze-Thaw Cycling According to DIN EN 12091

to determine the resistance to freeze-thaw cycling

Dimensions of test specimens:
500 mm x 500 mm
200 mm x 200 mm

Field of Application

The measuring method is applicable to homogeneous and approximately homogeneous as well as layered test specimens (insulating materials, floor structures and coverings).

Testing

To simulate freeze-thaw cycling the test specimens are exposed to 300 cycles of alternating temperatures of 20 °C and -20 °C for a period of one hour respectively (see Fig. 1).

For testing the test specimens are put in a basin, until they are completely immersed in water during the one hour lasting exposure to 20 °C. To prepare the test specimens for the subsequent freeze, the water in the basin is automatically removed by a pump. As soon as this procedure is completed, the climate chamber starts to drop the temperature to -20 °C and to keep it for one hour (see Fig. 2). Afterwards, the temperature is raised to 20 °C again and the basin is again filled with water.

After the test specimens have run through the 300 cycles, they are investigated for damages, e.g. cracks or bubbles, and the resistance to indentation is compared in the wet and dry state to the untreated original product.

Fraunhofer Institute for Building Physics IBP

Nobelstrasse 12
70569 Stuttgart
Germany

Department of Hygrothermics
Test laboratories of thermal characteristics
www.ibp.fraunhofer.de/pruefstellen

Dipl.-Ing. (FH) Andreas Zegowitz
Phone +49(0)71 1/970-3333
Fax +49(0)71 1/970-3340
andreas.zegowitz@ibp.fraunhofer.de

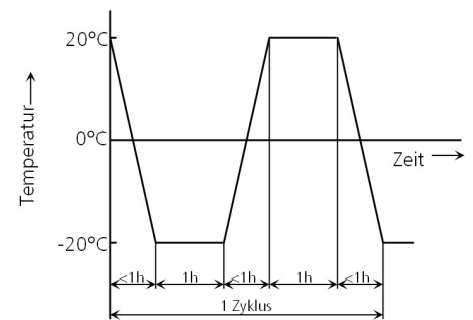


Fig. 1:
Temperature gradient during a cycle of the freeze-thaw cycling test

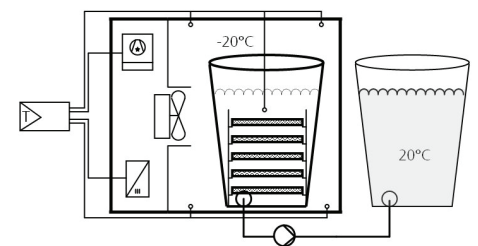


Fig. 2:
Drawing of freeze-thaw climate chamber during the freeze period