PHYSICAL TESTING ANALYSIS REPORT

Description: Determination of Frost Resistance

Test Method: In House Method based on prEN772-22

Lucideon Reference: UK214376-30182

Client:
Macey Building Products Ltd
Unit 8 Motley Mill
Weyhill
Andover
SP11 0PP

For the Attention of: Mr. Scott Rawlinson

Date Logged: 14-Oct-2021

Date of Tests: 15-Dec-2021 to 06-Jan-2022

Report Date: 11-Jan-2022

Purchase Order No.: mc001 / BACS

The sample was deviating and as a result, the test result(s) may be invalid.

Please find attached the results for the sample(s) recently submitted for analysis.

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Manager

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DETERMINATION OF FREEZE/THAW RESISTANCE OF CLAY MASONRY UNITS
Tested in Accordance with DD/CEN/TS 772:22: 2006 – Withdrawn

1 SAMPLES RECEIVED

6 flint faced solid concrete blocks with dimensions of 440 x 100 x 215 mm were received for testing as sampled by the client.

2 TEST PROCEDURE

2.1 Introduction

The test has been carried out in accordance with the European method DD CEN/TS EN 772-22: 2006, which involves subjecting a panel of brickwork to repeated freeze-thaw cycles to simulate naturally occurring conditions, with the exception of flint Faced blocks being tested. From the test the bricks are given a freeze-thaw resistance classification, which categorises the bricks as being suitable to withstand the following conditions:

F2 – Severe Exposure
F1 – Moderate Exposure
F0 – Passive Exposure

These classifications are only relevant for clay masonry units and should only be used as guidance for the samples tested.

The test method is summarised as follows:

2.2 Sample Preparation

Each unit was numbered and any existing defects on individual blocks noted before testing.

2.3 Construction of Test Panel

A panel of blocks consisting of three courses of two blocks in half bond was built to give a panel of approximate dimensions 740 x 660 mm using a 1:4 by volume High Alumina Cement: Sand mortar with bucket handle tooled finish to the joint was constructed. The panel was then left to cure in ambient laboratory conditions for a minimum of three days before testing.

2.4 Freeze/Thaw Cycles

The panel was immersed in water at room temperature for seven days before installation in a freeze-thaw apparatus which subjects the main face of the panel to repeated cycles of freezing and thawing following an initial freeze at an air temperature of -15°C for six hours. The rear of the panel was insulated with a 50 mm thick extruded polystyrene foam board and the sides insulated with a 25 mm thick polystyrene board.

A freeze-thaw cycle consists of 120 minutes (± 5 minutes) of freezing to -15°C (± 3°C) air temperature, heating with re-circulated warm air to 20°C (± 3°C) for 20 minutes and a two-minute flood coat spray at a water temperature of 18-25°C followed by a two-minute drain period. This gives ten cycles every 24 hours and a standard test will continue for 100 cycles.

2.5 Assessment of Freeze/Thaw Resistance

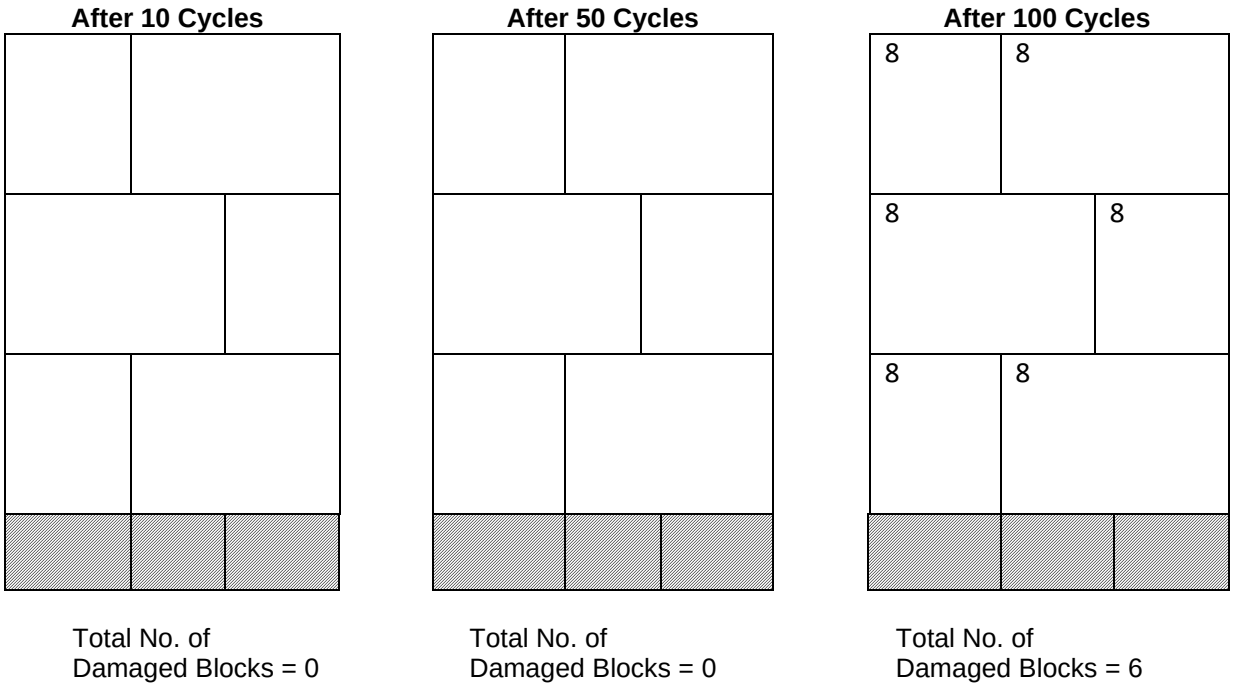
The panel was examined after 10 and 50 cycles. After 100 cycles the panel was allowed to thaw completely, removed from the apparatus and photographed. The panel was then dismantled and individual bricks examined for frost damage as categorised in Table 1.

Table 1

Categories/Types of Damage	Type
None	0
Crater (e.g. lime-burst)	1
Hair Crack ≤ 0.2 mm	2
Minor Crack	3
Surface Crack > 0.2 mm	4
Through Crack	5
Chipping, Peeling, Scaling	6
Fracture	7
Spalling, Delamination	8

2.6 Results

Incidence of Damage



Total No. of Damaged Blocks = 0

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Total No. of Damaged Blocks = 6

Incipient delamination detected by tapping the face of the panel with a metal rod is reported as ***C*** at 10 and 50 cycles if delamination is confirmed at 100 cycles.

3 CONCLUSIONS

From the test carried out, damage greater than type 3 (see Table 1) was observed before 100 freeze-thaw cycles and therefore the units would be classified as being F1 if clay masonry units had been tested i.e. suitable for use in conditions of moderate exposure

Guidance on the type of masonry subject to severe exposure conditions is given in Appendix B3.2 of BS EN 771-1 “Specifications for Clay Masonry Units”. Additional guidance may be offered by the manufacturer and the use of these bricks in specific situations.

4 PHOTOGRAPHS

Panel after 100 cycles

Lost Materials During Testing

END OF TEST REPORT