

FREEZE THAW TESTS ON STORMDRY

The objective of this short piece of work was to determine how Stormdry Masonry Cream influenced the frost resistance of brick and sandstone.

In order to do this a freeze-thaw test regime was devised where test pieces of treated and untreated brick and sandstone were frost tested. The test pieces were placed face-down in water which was then subjected to freezing to -20C and thawing at +20C. The freezing part of the cycle was carried out overnight (16 hours duration) and the thawing part during the day (8 hours). As the pieces were in contact with water, this represents a situation with a high rainfall water exposure.

Test Details

The substrates used were Fletton bricks and York sandstone.

1. A 50mm x 100mm sample was used in each case.
2. Each sample treatment was applied by brush
 Stormdry - 200g/m²
 Recipe R – 200g/m²
 Standard Water Repellent – 400g/m² (in 2 coats)
 Control - Untreated
3. The samples were allowed to dry for 2-3 days and then the edges were sealed with an acrylic solvent based sealer.
4. The samples were allowed to cure for 1 month before testing.
5. Each sample was labelled and placed coated face down in a tray of water, so that it was to a depth of 1cm.
6. Each Freeze thaw cycle consisted of 16 hours in a freezer at -20 deg C and 8 hours at room temperature 20 deg C.
 The test ran for 18 cycles before completion.

Results

The results obtained are shown in the table below.

a) Fletton Brick

Number of cycles	Stormdry Test 1	Stormdry Test 2	Recipe R	Standard Repellent	Control
0	OK	OK	OK	OK	OK
6	OK	OK	OK	OK	OK
12	OK	OK	OK	slight cracking	slight cracking
18	OK	OK	OK	cracking	cracking

b) York sandstone

Number of cycles	Stormdry	Recipe R	Standard Repellent	Control
0	OK	OK	OK	OK
6	OK	OK	OK	OK
12	OK	OK	OK	OK
18	OK	OK	OK	OK

Conclusion

The finding of this work is that the application of Stormdry improves the frost resistance of Fletton brick. This observation can be understood in terms of the water uptake and degree of saturation being reduced by Stormdry. The extent of saturation of stone and masonry is known to influence frost failure.

With the sandstone substrate, there was no observed difference between the frost resistance of the treated and untreated material

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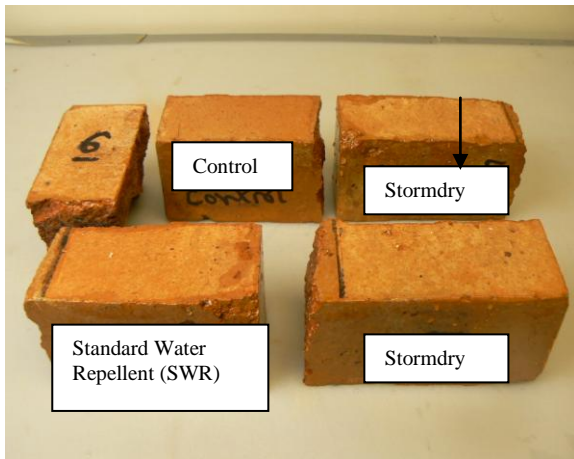
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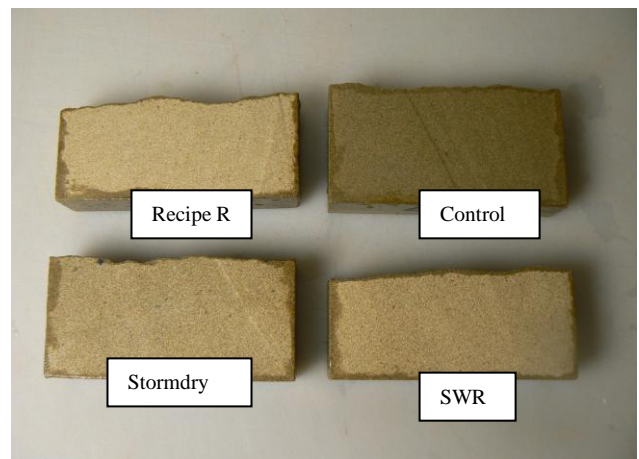
Photographs of Test Specimens

After 1 cycle – Pictures of the treated face after 1 cycle of frost testing

Fletton brick

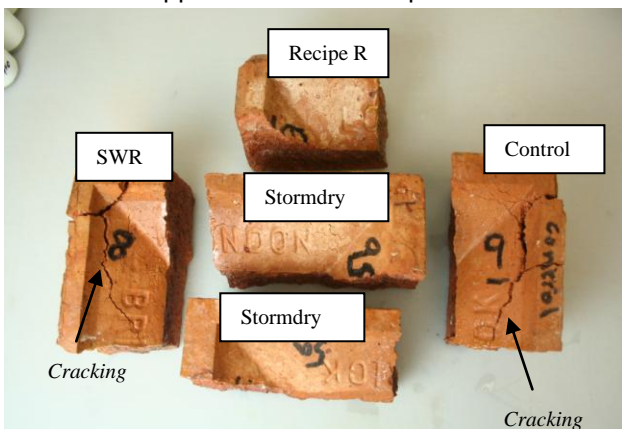


York sandstone



After 18 cycles

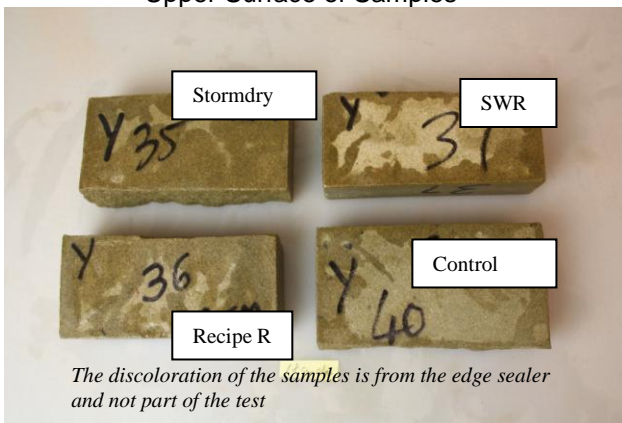
Upper Surface of Samples



Lower Surface of Samples



Upper Surface of Samples



Lower Surface of Samples



Temperature profile in the freezing part of the frost cycle

