

Experiments on Improving the Water Resistance of Dry Mud

Some samples of compacted dry mud were submitted to Safeguard to see if it was possible to impart water resistance.

Substrates and Preparation

The samples received were small pressed blocks of either mud or mud and straw. Two methods of treatment were tried

(a) Dryzone

In order to see if Dryzone could impart any water proofing, Dryzone was mixed with the mud at 10% weight addition and new blocks were formed by hand pressing between glass plates. The treated and untreated controls were put aside for 28 days to allow any curing to proceed. At the end of this period the samples were divided into two groups. One set was oven dried at 50C for 16 hours and the other was left undried. The point of oven drying was to make sure the samples did not contain any moisture prior to the running the water absorption test

(b) Stormdry

Stormdry is a cream that is applied to masonry surfaces to impart surface water resistance. This cream was painted on some of the mud samples at a rate of 200 g/m². The samples were left to cure for 28 days before water absorption

In both cases (a) and (b) above, water absorption testing was carried out to a method similar to ISO 15148:2002. The samples were placed face down on a wet sponge and the water uptake measured by weighing.

Test Results

Pictures of the samples at various stages on testing are shown on the following pages. The results of the test are in the table below.

Table 1: Water absorption of treated and untreated samples (refer to the key on the next page)

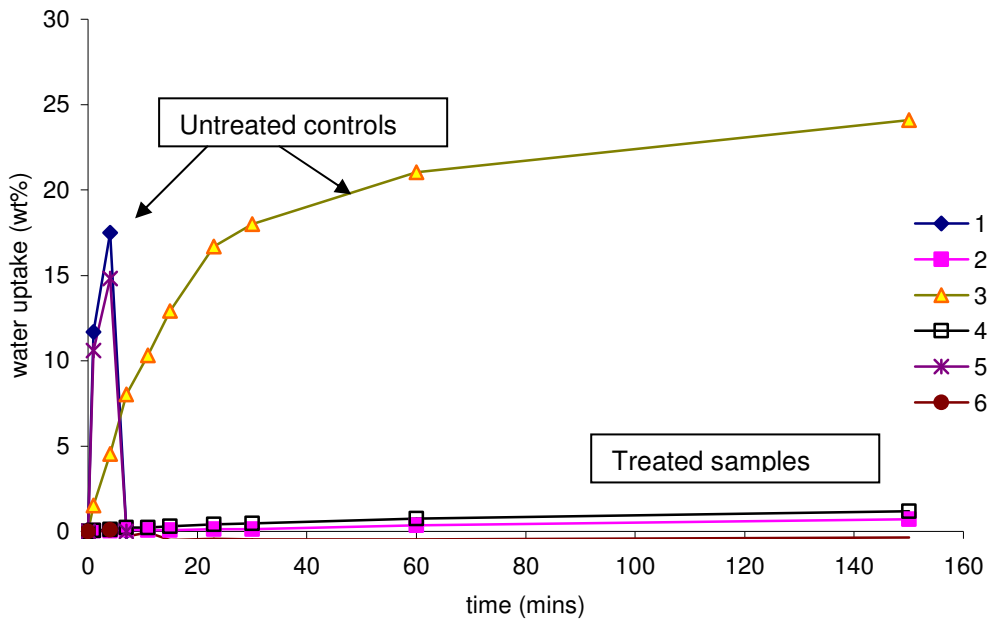
Minutes	Increase in weight by water absorption (wt % of original)					
	1	2	3	4	5	6
0	0	0	0	0	0	0
1	11.68	0.03	1.51	0.06	10.60	-0.05
4	17.50	0.05	4.56	0.11	14.82	0.09
7	fell apart	0.09	8.02	0.22	fell apart	-0.29
11		0.08	10.32	0.22		-0.05
15		0.08	12.92	0.30		-0.51
23		0.12	16.70	0.41		-0.43
30		0.14	18.01	0.47		-0.46
60		0.35	21.04	0.76		-0.46
150		0.70	24.11	1.18		-0.35

Key to Table and Figure 1

- | | |
|-----------------------------------|--|
| 1= Untreated control (oven dried) | 2= 10% Dryzone added to mud (oven dried) |
| 3= Untreated control | 4= Stormdry applied to surface |
| 5= Untreated control | 6= 10% Dryzone added to mud |

The graph below shows a plot of the data

Figure 1: Plot of water absorption data



Conclusions

- Both of the two treatments applied have a significant benefit in improving water resistance.
- Dryzone mixed into the mud at 10% is effective. The mud loses some plasticity after mixing – possibly because of the reaction. Looking at the data, there is a reasonable possibility that lower addition rates will be effective such as 1 and 2% (a reduced influence on plasticity would be expected)
- Based on these results, it would be expected that Dryzone will prevent rising damp occurring in mud based mortar joints
- Stormdry façade cream imparts water resistance to the surface of the mud. After being in contact with water for 60 minutes, the weight gain of the untreated mud is 21% whereas Stormdry reduces the weight gain to 0.8%.

The results are consistent with water resistance being imparted to silicate based minerals in the mud.

Eric Rirsch
4/11/09

Figures 2 and 3

Water droplet on the surface of the mud treated (T) with Stormdry (FC215) compared with untreated (U)



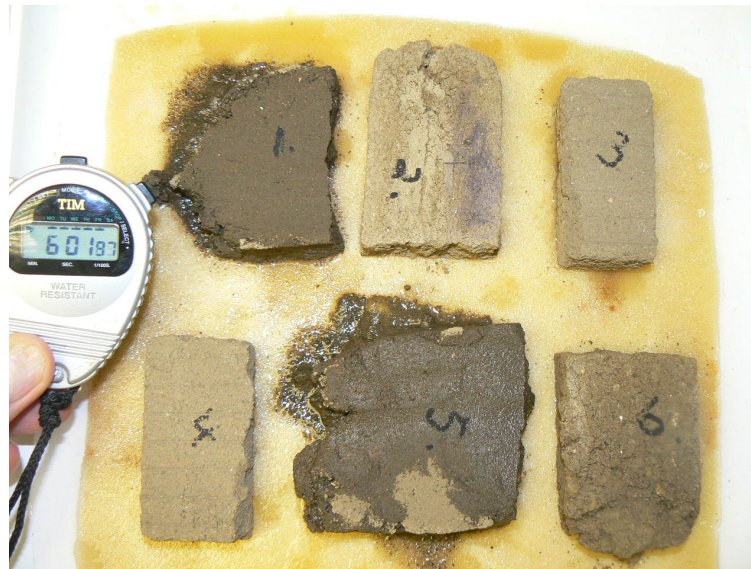
The right hand side sample has Dryzone added at 10% to the mud



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Figures 4-8

Photographs showing the water absorption test after 2,6,21 and 60 minutes.

The water penetrates the untreated samples 1, 3 and 5 whereas the upper surface of the treated samples 2, 4 and 6 remains dry.

Key

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- 2= 10% Dryzone added to mud (oven dried)
- 3= Untreated control
- 4= Stormdry applied to surface
- 5= Untreated control
- 6= 10% Dryzone added to mud