



# Appleton Sandstone

## **Technical Data Sheet**

### **Appleton Sandstone**

Appleton Quarry

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This data sheet was compiled by the Building Research Establishment (BRE). It is based on data from current tests at BRE (2000). The data sheet was compiled in May 2000. The work was carried out by BRE as part of a Partners in Technology Programme funded by the Department of the Environment, Transport and the Regions and Marshalls Mono Ltd. and does not represent an endorsement of the stone by BRE.

### **General**

Appleton quarry has produce a variety of stone from the late 1800s formerly under the name of Greenmoor rock and Grenoside. For a short period prior to the 1980s it was primarily worked for the clay deposits in the quarry and in 1983 stone extraction began again. There are good reserves of stone. Material varies in size from 1.2 – 1.7 m in height to 0.75 – 0.9 m in height depending on the location within the quarry. The larger size provides good lengths up to 3m . The larger size is traditionally used for paving and dressings, whilst the smaller size is used for dressings and roof slates.

### **Petrography**

Stone from Appleton quarry ranges from a fawn colour to a darker mottled brown, fine grained sandstone from the Coal measures of Carboniferous age.

### **Expected Durability and Performance**

It is important that the results from the individual tests are not viewed in isolation. They should be considered together and compared to the performance of the stone in existing buildings and other uses. Sandstone is traditionally acknowledged as generally being a very durable building and paving stone and has been used extensively in many towns and cities in the UK. Appleton sandstone appears to be a durable stone that will have good resistance to acid rain or air pollution. The negligible weight loss in the sodium sulphate crystallisation test indicates high resistance to salt damage. The moderate weight loss in the harsher saturated sodium sulphate crystallisation test

indicates a slight susceptibility to very harsh salt environments (for example in coastal locations or from de-icing salts). From the frost test the stone should have good frost resistance. The compressive and flexural strength of the stone is high for a sandstone. The high density and compressive strength indicate that the stone should be suitable for use in heavily trafficked areas.

Overall, Appleton should be suitable for use in most aspects of construction including flooring, paving, load bearing masonry and cladding. The stone is traditionally used for paving.

**Test Results – Appleton Sandstone**

<b>Safety in Use</b>		
Slip Resistance <sup>(Note 1)</sup>	73	Wet. Values > 40 are considered safe.
Abrasion Resistance <sup>(Note 1)</sup>	22	Values <23.0 are considered suitable for use in heavily trafficked areas (based on data for Greenmoor provided by the producer)
<b>Strength under load</b>		
1) Compression <sup>(Note 2)</sup>	143.2 MPa	Loaded perpendicular to the bedding plane ambient humidity

2) Bending <sup>(Note 1)</sup>	18.3 MPa	Loaded perpendicular to the bedding plane ambient humidity
	Not tested	Loaded parallel to the bedding plane ambient humidity
<b>Porosity and Water Absorption</b>		
1) Porosity <sup>(Note 3)</sup>	10.9%	
2) Saturation Coefficient <sup>(Note 3)</sup>	0.63	
3) Water Absorption	2.9% (by wt)	
4) Bulk specific gravity	2384kg/m <sup>3</sup>	
<b>Resistance to Frost</b>		
Flexural strength after Freeze/Thaw Test <sup>(Note 1)</sup>	12.6 MPa	Loaded perpendicular to the bedding plane ambient humidity

<b>Resistance to Salt</b>		
Sodium Sulphate Crystallisation Test (Note 3)	-0.64% Mean wt loss	
<b>Resistance to Acidity</b>		
Acid Immersion Test <sup>(Note 4)</sup>	Pass	

(Test methods Note 1 = EN1341, Note 2 = EN 1342, Note 3 = EN 1341 /BRE 141, Note 4 = BRE 141)

Tests were carried out at BRE in 2000