

## Data Sheet - Dry Shrinkage

CSTB9

### DRY SHRINKAGE

This phenomenon generally affects slender units such as cills, heads and jambs when used mortared into brick and stone walls. It is not usually connected with larger profile units. Cracks are far more likely to occur in long units (over 1.75m) and are unlikely in units of less than 1m.

### CAUSES

Cast Stone, as it cures, shrinks slightly as water is both used up in the Cast Stone curing reactions and also evaporates in the atmosphere.

The problem is more likely on the south facing walls as the sun dries out the Cast Stone rapidly. This shrinkage always occurs to some extent and is a natural phenomenon of Cast Stone or any product made from concrete. The rate at which it occurs and the extent to which it affects different parts of the product governs the way in which this manifests itself.

When used in conjunction with products that have different drying/weathering shrinkage, e.g. clay brick or natural stone, stresses will be set up in the structure that are normally relieved by slight cracks in the mortar. These are entirely normal and will not cause problems. This problem is most common where clay brick is used with Cast Stone items because the brick expands slightly as it weathers. It can also occur in natural stone and concrete product applications where cills, heads, etc. are of widely different ages to the walling product. The United Kingdom Cast Stone Association (UKCSA) normally recommend the use of lime-containing mortars because of their property of self healing of these cracks. However, if too strong a mortar is used, the crack, instead of occurring in the mortar, occurs in the Cast Stone unit. Please refer to the UKCSA Technical manual section 6.0 installation (6.5 Mortars)

### REMEDIAL WORK

Clearly, if the correct mortar has been used the problem is unlikely to occur. Similarly if the cill/head is bedded so that movement can occur relatively freely, this type of cracking should be eliminated.

However, if it does occur, the crack can be repaired by grinding/scraping out the crack, coating the inside of the crack with a suitable bonding agent, followed by filling the cavity with a cement based material identical to that used in the manufacture of the original product. The crack should be filled to stand slightly proud of the surface and then rubbed down with a flat stone to the level of the surrounding area a few days later.

This remedy will not prevent further cracking occurring should drying shrinkage not be complete at the time of the repair. It is recommended that Marshalls Limited is contacted prior to any remedial work being undertaken.

### PRECAUTIONS

To minimise the occurrence of shrinkage cracks:

- Install units only when they are not less than 28 days old
- Use correct grade of mortar
- Introduce horizontal slip membranes between Cast Stone and all other materials
- Bed units in accordance with UKCSA or relevant British Standard recommendations
- Further detailed guidance is available from the UKCSA Technical Manual.