



## PROPER TESTING METHODS FOR TILE / STONE INSTALLATION

In the field of Tile/stone installation materials strength parameters such as shear bond strength & tensile bond strength are frequently used. That does not mean that they are fully understood. Let us understand each of these and analyse the difference between them.

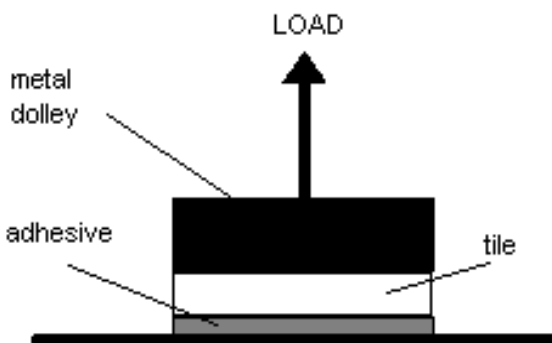


Fig 1

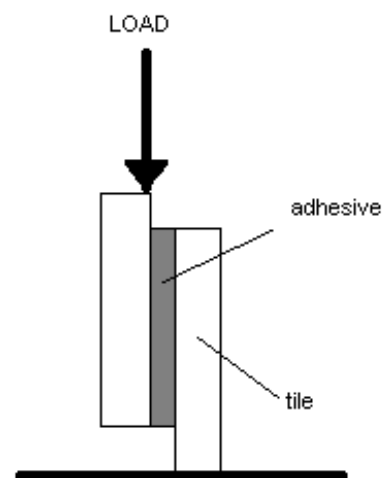


Fig 2

In tensile test, force is applied perpendicular to the tile surface until the adhesive bond fails. (fig 1)

In shear test, force is applied by pushing the tile and whatever it is bonded past each other until the adhesive bond fails. (fig 2)

The tensile type of test is used in BS 5890 and is often used as a site test. The shear type of test is used in ANSI 118.4 and BS 5980 and is difficult to carry out as an in situ site test.

### What are the pros and cons of each type of test?

Most of the forces that an adhesive experiences in situ are in shear. These arise from daily heating and cooling (fig 3) and from changes in dimension of the substrate material (fig 4), most often due to creep and shrinkage.

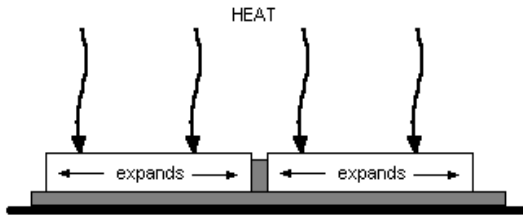


Figure 3

Even where appropriate expansion joints are installed, the forces arising from these types of movement are quite substantial. **Thus, as a measure of the performance of the adhesive, shear strength is by far the most important.** It should be noted that the American ANSI code does not refer to tensile adhesion strength at all for this reason.

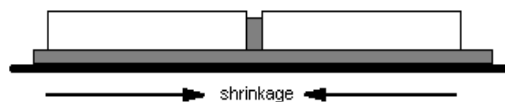


Figure 4

This is not to write off tensile testing. It is difficult to apply a shear force in situ on a building, the tensile type of test is much easier to perform because it is more portable. This makes it convenient for quality control testing to assess workmanship or investigative testing of questionable installations. It is not so suitable, however for determining the performance of the adhesive material used.

### To conclude

- Tensile bond strength is where the load is perpendicular to the tile surface.
- Shear bond strength is where the load is parallel to the tile surface
- Most load at the tile/adhesive interface is in shear
- Shear strength is therefore the critical performance criteria for tile adhesives
- Tensile bond strength is a convenient in situ Quality Control test

Laticrete products are designed to meet most of the international standards such as ANSI, BS, DIN, JS and the recently introduced EN. However, Laticrete mostly follows ANSI standards as they are most comprehensive and widely accepted across the world.

Laticrete R&D lab at Rudraram Factory is equipped with the latest instron UTM for testing of the products according to ANSI and EN.

Testing methods and standards are an aid to judge the good from the bad, hence it is in the best interest of the user to demand test certificates for products used.

To conclude a product cannot be classified as good or bad unless it is proven through proper testing using appropriate equipment as designated and detailed in the standards.