



**CERAMIC TILE INSTITUTE OF AMERICA, INC.**  
12061 Jefferson Blvd., Culver City, CA 90230-6219

## **CTI REPORT 72-2-1 (R-85)**

### **SUBJECT: REMOVAL OF DEAD CEMENT FROM CONCRETE SURFACES**

#### **I. INTRODUCTION**

- A. Dead cement! What is it? It is a layer of cement on the surface of concrete that is detrimental to a bond. When it is present, observation will reveal a powdery surface on the concrete without any of the pores opened to provide a key and to obtain a good bond. The surface can be scratched with a coin or knife blade and a dead layer of cement can be seen powdering away.
- B. There is a definite reason why the dead cement is on the concrete surface. To quote the superintendent of one of the large general contractors, "If I do not kill a layer of cement on a concrete surface, I cannot remove my formboards. Formboards are expensive and we cannot afford to break them up when they are removed because they are adhered to the concrete."
- C. While on the subject of dead concrete, it may be good to include some consideration of all concrete surfaces that are difficult to bond to. Concrete surfaces can have a layer of dead cement not made by formboards or be in other ways improperly prepared to obtain a bond. These can be horizontal floor surfaces and vertical surfaces such as tilt up concrete panels.
- D. The Standards of the tile trade require and state that concrete surfaces shall be sandblasted. It is true that sandblasting is necessary in most of all cases, but, of course, there are minor exceptions to all rules which will be covered in the following comments. Basically, the requirements in the standard for sandblasting are meant for vertical surfaces, but many times both vertical and horizontal surfaces need to be sandblasted or scarified in order to obtain a bond.

#### **II. REMOVAL OF DEAD CEMENT**

- A. A heavy sandblast has been found most satisfactory in removal of dead cement. In doing the sandblasting, there are no written specifications, that we know of, that would define what is meant by heavy sandblast. The sandblasting company should be well aware of what is going to be required in order to provide the proper bondable surface.
- B. Sandblasting shall remove all of the layer of dead cement. The appearance of the heavily sandblasted surfaces should also open small pores and leave a roughened surface.
- C. A roughened surface will result in a complete marriage between the concrete and the bonding material. If test specimens were bonded to and removed from such a rough surface by tensile testing they will pull off some of the concrete and this is the type of bond that is necessary to achieve.
- D. In establishing the Standards of the tile trade, and the requirements for sandblasting concrete, other methods of treating the concrete were considered. They have not been adopted. These include acid etching, washing solutions, and so called bonders. We are also told that there are bond breakers that disappear and leave a bondable surface after the formboards have been removed. We have found this to be erroneous information. The powdery surface will be there and must be removed.
- E. Sometimes the area, where the concrete is located, makes it impossible to sandblast. These areas should then be scarified in another manner. This can be by grinding tools or by a bushhammer.
- F. We often hear of contractors that are going to go ahead and use acid etching or bonders to treat the concrete hoping that it will provide a satisfactory surface. It goes without saying that if they are

failure? They receive no backing from the tile trade because the work would then be done contrary to the Standards of the tile trade.

- G. Can new methods be adopted into the Standards? Yes, they can, but they must prove themselves before the Technical and Job Problem Committee will adopt them.
- H. Experience is teaching that concrete surfaces should be specified to be broom finished for bonding a tile installation. This finish will provide a good bond and then the scarifying can be eliminated. What we need to accomplish is to receive other than a hard troweled rotary finish, which is not satisfactory, regardless of whether it is on a vertical surface such as a tilt up panel or on a horizontal floor surface.

### III. Exceptions To Sandblasting

- A. On a recent tilt up job, the property provided sufficient room so that the tilt up concrete slabs could be poured, without stacking one slab on top of another. Therefore, bond breakers were not necessary and it was possible to give the concrete a steel trowel with a light broom finish.
- B. The broomed finish on the wet concrete panels provided an excellent roughened surface to achieve the necessary bond. This surface was inspected by the tile subcontractor, the architect, the general contractor, and the Ceramic Tile Institute, and all agreed that it was an excellent surface. A small sample panel was installed and a practical test with a hammer and chisel used to verify the bond. It was excellent.
- C. The broom finish will also provide an excellent surface for floors if it is kept free of curing compounds. It shall also be made clear that although we want a broomed finish on the concrete surface, it must be kept straight, level and smooth prior to the brooming.

### IV. Practical Testing

- A. A practical test, of three separate areas on a surface to be tiled, is an excellent way of insuring against failure. These should be six to twelve inch square of tile, bonded to the properly prepared surface, with the actual tile and bonding material that will be used on the finished installation. These should be allowed to cure three to seven days and then removed with a hammer and chisel. If they shear off clean, on any of the surfaces, a proper bond has not been obtained. If, on the other hand, they are difficult to remove, breaking into the concrete, they provide the proper bondable surface.
- B. These sample specimens should be used to test surfaces provided by others, such as a dash coat or scratch coat by the plasterer.
- C. They also should be used to test any procedures that are to be done by the tile contractor.

### V. Conclusion

- A. Sandblasting, bushhammering, or scarifying is necessary to remove the dead layer of cement.
- B. A steel trowel with light finish, over which no bond breakers or curing compounds have been placed, provides a bondable surface.
- C. In all cases, use the practical testing to assure that an adequate bond is achieved.