

Creep ◀ ▶ My Opinion

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Q: On page 3-4 of the Marble Institute's *Dimension Stone Design Manual*, it refers to the term "creep", and defines it as a "permanent structural distortion". I've seen this term used in other manuals as well; isn't this simply the same thing as deflection?

A: Not really, in that creep is considered to be a permanent deformation, meaning it won't recover, at least not fully, when the load is removed. Deflection is generally considered to be an elastic deformation, and would recover if the load were removed.

For a common, everyday example, let's think of a book shelf. Assume you've just installed a new, perfectly flat bookshelf in your office. Then you load it up with design manuals, natural stone galleries, management toolkits, and other must-have publications that you've just purchased with your member's discount from the [MIA bookstore](#). Immediately upon placing the books on the shelf, you note that it bends downward slightly. This would be deflection, and if you were to immediately remove those books, the shelf would spring back to its original flat profile. If you were to leave those books on the shelf for a year (which is the typical interval between dusting of shelves in my office), you will see that it has bent downward significantly. This distortion is much more than that of the original deflection, even though the load (weight of the books) was never increased. You then remove the load, but nearly all of the deformation remains, even with no load on the shelf. So you decide to leave the shelf empty over the weekend, which will allow it to recover to its original flat profile, but when you return on Monday morning

you note that the shelf is still bent. Over time, there has been an accumulative increase in strain within the shelf due to the load, most of which won't be reversed just by removing the load. That would be creep.

Q: I have a client who is looking to use a stone tile for a steam shower, but the specification says it must be compliant with A137.1? Do you have a table or reference that tells me which stones comply with this standard?

A: Unfortunately no stones would comply with that standard, since it is not applicable to natural stone. The specification was either originally intended for a ceramic tile, or it was copied from a project using ceramic tile. ANSI A137.1 is a voluntary standard for ceramic tile, and all of its content is specific to that product. Natural stones are not addressed in this document.

Q: I've reviewed the Marble Institute of America's tech bulletin on marble soundness. I think there are some glaring errors in this document. Many of the white marbles are listed as soundness A or B, which are the exterior grade marbles. These are poor choices for exteriors, as these are the stones that are most likely to develop hysteresis. This document should be corrected.

A: As a very general rule of thumb, soundness groups A and B are the exterior worthy materials, and soundness groups C and D are not, but there are many exceptions to this rule. Determination of a specific material's ability to perform in exterior

environments really requires research of that particular material, and in many cases, a particular lot of that material.

This perhaps could be better clarified in the document, and we can address it in a future release of the bulletin. The issue of hysteresis and weathering durability are different issues. A hysteresis failure of a marble doesn't mean that the marble is not exterior worthy, but rather that the ratio of thickness to panel size was inadequate. This is a design issue rather than a product failure. One can create a failure using virtually any product if used in an inappropriate thickness for the application.



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