


C - 12: Calcium Chloride: A Concrete Accelerator

In cold weather, the usage of concrete accelerators increases substantially. Calcium chloride is the most commonly used accelerator. The following guidelines describe its proper use.

1. Calcium chloride should not be used where sulfate resistant concrete is required.
2. Calcium chloride has been found to increase the expansion caused by cement alkali-silica reactions, so should not be used where this reaction has a likelihood of occurring in concrete.
3. Do not use calcium chloride to lower the freezing point of water in concrete.
4. Calcium chloride precipitates most air-entraining agents and some water reducing agents when mixed in the same solutions. Therefore, it is important that the material be kept in separate solutions and introduced separately into the concrete mixer.
5. Using calcium chloride in one section of concrete, but not using it in an adjacent section of concrete, can cause variations in concrete color.
6. Calcium chloride should not be used in pre-stressed concrete because of its potential for accelerating the rate of pre-stress steel corrosion. Use a non-chloride accelerator in this application.
7. The presence of chlorides has been associated with galvanic corrosion between galvanized and plain steel, when galvanizing is used on permanent forms for roof decks or embedded parts. Calcium chloride should not be used for such construction.
8. The upper limit for the addition of calcium chloride to a concrete mixture is 2% by weight of the Portland cement content.
9. Concrete containing embedded aluminum (for example, conduit) should not use calcium chloride as an accelerator since serious corrosion of the aluminum can result.
10. Calcium chloride should be avoided in concrete floor slabs intended to receive a dry shake metallic finish.
11. Calcium chlorides should not be used in hot weather or in massive concrete placements.

When properly used, calcium chloride can be very effective in increasing early strengths and reducing setting times. 

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