

OVERVIEW: Outdoor concrete in a cold climate

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Air Entrainment

When ordinary concrete gets wet and then freezes, the ice crystals can cause surface chipping, or even more serious fracturing. All outdoor concrete in Canada, even by code, should be what we call air entrained. This means that there are microscopic air bubbles in the concrete that, because of their size, can only fill half full with water -- leaving room for freezing water to expand without damage to the concrete. Until recently air entrained concrete was only available from concrete delivery trucks. Finally King Packaging brought out their 'high strength concrete' called PSI 6000, and it does become air entrained when mixed in ordinary mixers or well mixed with a shovel. Although a bit more expensive, if you want any outdoor concrete project to last without spalling or cracking in a cold climate, don't use anything else.

Unfortunately in 2016, this clearly marketed packaging no longer exists but this excellent product is still available. Packing and names change with time but when I searched for this product in 2025, I found the same product (still made by King Packaging) being sold at Home Depot under the name Sakrete PSI 6000. This link has a great and through installation video -- not to miss.

If you are pouring pillars in Sono-Tubes for decks, truck delivered concrete should also be air-entrained, but smaller batch mixed jobs can use pillar and fence post concretes that may not remain beautiful but will remain strong.

The OdJob

For those small jobs around the house there is a great little barrel mixer called the OdJob. It is a plastic barrel just made for one sack of concrete. It has fins on the inside that do the mixing when you roll it on the floor. Always follow the instructions to the letter as to how much water to use. Too much water will seriously weaken concrete.

Forms

Here we are simply pouring the concrete into forms, that once the concrete is partially set, are pulled up and they leave a fancy section of walkway or patio behind. Never smooth off concrete too much, it will weaken the top.

Push the concrete into a form, jab it with a stick to pack it well, but don't polish the top. You may even want to finish off the top with a rough broom just before it gets hard to give you a non-slip surface.

Steps

If you are fixing steps with surface patching materials like Top & Bond there are two tips to a lasting job in a cold climate. Of course remove everything that is loose. Then use a bonding agent -- purchased right next to the patching material itself. While the bonding agent is still sticky, apply the patch.

Use a wooden form if needed for vertical faces. Then cover the whole thing in plastic to keep it wet for three days. Keeping concrete moist for long curing times is what makes it strong. Working on the vertical face and the concrete wants to sag? There are special quick set materials just for that job.

If you are filling in massive holes in concrete, like beam sockets, check out Patching Massive Concrete. Follow this link on using left over concrete to avoid taking that left over mix to the dump, or

even trying to store bags without them going hard over the winter.

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