

Mix is setting too slowly

This is most likely due to a cool location or using cold water. If the object you are working on is portable, carry it into a warmer location. Next time use a warmer location, use warm water, or be patient.

If the surface of concrete in contact with a metal mould surface is not setting, this can sometimes be a chemical reaction with copper alloys in the metal, slowing down the set time. Spraying a release agent on the mould, or coating it in plastic film or packing tape, will prevent this. If the concrete is in contact with an unpainted wood surface in a mould, water can be pulled out of the mix so the cement does not cure properly.

Air bubbles on the surface

Some air bubbles are unavoidable when casting. Air gets trapped during the mixing. Vibration helps to float the bubbles out. Tap the outside of the form after filling the mould. I sometimes use an electric engraver to vibrate small jewellery moulds. A palm sander can be used for castings up to 24" or so. For very large cast-in-place work you can rent a concrete vibrator. Caution: too much vibration will separate the aggregate from the cement, so be careful.

Cracking

The first thing to consider if the concrete develops cracks is that you used too much water. This leads to excessive shrinkage. The second thing to consider is the quantity of aggregate. If you don't use enough aggregate, or if the concrete is too rich with cement, you will have excessive shrinkage. Remember that aggregates don't shrink, but cement paste does.

Cracks will sometimes develop where you use one type of mix on top of another. A smoother mix may have less aggregate in it and shrink more than the layer underneath, creating hairline cracks.

Surface cracks can also develop where the cured concrete is exposed to severe temperature changes, and is too thick. See the **STRESSES** chapter.

Cracks that are deep and develop long after the concrete has cured could be due to insufficient or improperly placed reinforcing. Stresses will crack concrete over time, unless the reinforcing is appropriate. Make sure the rebar surface is sufficiently rough.