Concrete Solutions That Go Beyond The Surface.

Test Your Form Oil – Do It Yourself Concrete Form Release Agent Testing

Written by: George Baty and Rick Reynolds, Updated February 4, 2014

How do you tell if the Form Release Agent you use or want to use meets meaningful standards for spraying in winter and summer, for producing architectural concrete, for minimizing concrete build-up on the form, and for other quality benefits? No ASTM or ACI or AASHTO standards exist to differentiate among the many proprietary brands.

But tests do exist for making meaningful comparisons. By using these subjective tests, which you can run yourself, and by carefully interpreting the data you can consistently produce excellent results. Basically, the secret means running a control test every time you run an evaluation test.

This series of 10 tests is for evaluating concrete Form Release Agents. Though only a few tests are written, periodic updates will complete the 10 in the next several months. We solicit your comments on these tests and any you have developed on your own. Please e-mail comments to cresset@cresset.com.

1. Cold weather spraying:
Fill three untextured glass jars about 75% full. Tighten a cap on each. Put one sealed sample jar into another, larger empty glass jar with a tight cap. Seal the second sample jar into another, larger empty glass jar with a tight cap. (The reason for a jar in a jar is that odors from some oils, especially diesel oil, will escape from plastic containers or a single glass jar and contaminate the taste of any food in the refrigerator.) Put one sample in the refrigerator. Put another sample in the freezer. Save the third sample in a safe place at room temperature. (Typically a refrigerator is 35° to 40° F and a freezer section is 0° to 5° F.)

After 2 hours remove the samples. Make two observations: a) Look for small light floaters in the liquid and on the bottom of the jar. The best release agents are clear…for both samples. Unfortunately, some inexpensive form oils will pass this test but not pass some of the other tests. The floaters are the active ingredient. b) Tilt the jar back and forth. Compare the refrigerator and freezer samples to the room temperature sample. The better release agents will show very little increase in "thickness" with the freezer sample. Ideally, you want no increase in "thickness"…but most VOC compliant oils will "thicken" a little. Solvent based form oils may or may not thicken, depending on the specific blend of oils. The worst form oils will thicken in the refrigerator. Optionally you can drop a marble into each of the samples. The time it takes to reach the bottom is directly proportional to the "thickness", but the jars must be identical to get comparable results.

Spraying quality is directly related to the "thickness" of the oil. (New 30 weight motor oil, at room temperature, is four times the maximum "thickness" recommended for producing a good spray pattern.) If the cold specimens are thicker than the room temperature 30 weight oil specimen then you will probably have problems producing architectural concrete.

At cold, ambient temperatures Crete-Lease Release Agents still produce an excellent spray pattern. This helps you produce architectural concrete even under adverse conditions and you will substantially reduce your material costs.

2. Release Agent Odor:
Take a teaspoon or so of diesel based form oil. Rub it onto your hands as if you were washing your hands in the form oil. Smell your hands. With soap and water wash your hands. Smell them again. Do the same with Crete-Lease 727-Xtra, Crete-Lease 880-VOC-Xtra or Crete-Lease 20-VOC-Xtra. Imagine going home to loved ones or eating with the diesel oil smell on your hands.

3. Non-dusting and non-staining:
Obtain some standard forms…we suggest 18 inch square, steel patio block forms. (Steel forms promote reproducible results because the steel does not absorb form release agents like wood does.) Wipe the test release agent onto the form in a thin film. Dip a cotton flannel rag into the test form release agent and wring it dry. Now wipe out the form again. You should have an ultra thin film of form release agent covering the inside of the metal form.

To another identical form pour in an excess of form release agent, say about 1/16 inch thick. Swish it around to cover the whole form.

Place concrete, from the same batch, into both forms. With a shovel carefully place concrete into the form until it is completely full…do not pour it into the form. Strike off excess concrete and vibrate each exactly the same. Store until hard.

If the forms are about 80% or so full you will see some differences when you carefully remove the forms. The ultra thinly coated form with Crete-Lease 20-VOC-Xtra, Crete-Lease 880-VOC-Xtra or Crete-Lease 727-Xtra will strip very cleanly and easily. The concrete surface will be hard, stain free and not dusty. It will take on exactly the surface characteristics of the form. Other form oils may have some difficulty in releasing and or cause dusting and or staining.

If the forms are too full the excess concrete around the edge does contribute to increased difficulty in stripping…try it.

The thickly coated forms come off just a little bit harder. The concrete will be full of bugholes…except the water-based Crete-Lease 20-VOC-Xtra. Note that the concrete surface, though full of bugholes, is not stained nor is it very dusty. These forms require slightly more clean-up than the "ultra thin" forms. This is a severe test and it really shows the dusting and staining effects of most form oils.

For your information, there is a huge cost savings in applying release agents in ultra thin films. In this example, you applied 125 times more release agent in the thick film test than in the ultra thin film test. Hopefully, you don't apply release agents that thick, but even if you applied the thick film 0.008 inch thick (about 1/128 inch thick) you are using almost 16 times more release agent than in the ultra thin film test.

View the CCS photographs to see how thick you may be applying your form release agent.