

An Easy Way to Measure Density in the Field

When producing cellular concrete one of the most critical aspects is ensuring that material density is kept within specification. Material that's too light can end up with lower compressive strength than required, and even worse, could collapse before it's even set. If your material is too heavy, you're losing yield, which is equivalent to losing money. Also, if your material is too heavy it's putting increased hydraulic loads on the walls, pipes, forms, etc.. that it's being used to fill in and around, which can lead to structural problems. Additionally if the material is too heavy, it won't be easily excavated at later time should the need arise.



Regardless of your equipment or process used to produce cellular concrete, samples of the material should be taken as close to the point of placement as possible for checking density. Typically contractors will use a container of a known volume, (3X6 cylinders are commonly used because they're specified by ASTM 495 for making cylinders to be

used in compressive strength testing), and then weigh the net weight of the material which is then converted to pounds per cubic foot (PCF). While 3X6 cylinders are convenient because they're already on-site and need to be filled, they're not very convenient to check density. To convert the net weight to PCF, you need to divide the net weight by .0245. While the calculation is simple, ensuring that the proper personnel can remember it, and then punch it into a calculator while in the field with hands that are either covered in slurry, or gloves, in the midst of everything else, can be a little more challenging. Cheat sheets and charts for the containers you're using can ease things, assuming you remember to bring them to the job, or haven't lost them.

The easiest method that eliminates formulas, cheat sheets, or doing calculations, simply requires a 1/10th ft³ pot, and a digital scale that will measure to the tenth of a pound. Once you've tared out the scale (for the weight of the pot) and then filled the pot, the net weight will be 1/10th of the material density in PCF. So, if the net weight of the material reads 3.3 pounds on the scale, by moving the decimal one place to the right, you can see the material density is 33 PCF. To ensure accuracy it's important to use a quality scale and pot with the correct volume.

To make things even easier Richway can provide a Field QC Kit, which includes a 1/10 ft³ unit weight pot, a rugged, waterproof scale with built in battery and recharger. The kit also includes a scoop for filling the pot and a toolbox to ensure all components are kept together and ready to head to the field.

