

Cast Hemcrete Process – Small works equipment list

This list is intended as a guide – it is not definitive – if there are elements you feel we should have listed here - please let us know!

PPE

Minimum requirements – to be reviewed by the H&S supervisor in combination with CoSHH information, risk assessments and method statement. The main irritant is the binder and avoiding contact is the key issue hence;

1. **Barrier cream - hands and forearms – all team members**
2. **Gloves – plastic with knitted elasticated wristbands – all team members**
3. **Goggles and face mask - those in close proximity to the mixing – best solution is a full face respirator with filters suitable for lime dust as shown below. These are available with rechargeable batteries which provide a flow of air keeping the mask clear. Goggles and disposable masks don't work as well, are not comfortable and get discarded.**



Consider clothing as well – long sleeves are better than short sleeves, long trouser rather than shorts. Sleeves should go over the gloves to prevent filling the inside of the glove and same logic when wearing wellingtons – avoid getting your boots full.

Plant - A fork lift is not essential but you have to take a delivery and store it, feed the mixer and move a lot of material, particularly the vertical lift to the higher shutters. Moving the mixer set up can make for a much easier delivery of mixed material to the shutters on the opposite side of the building and this is not easily done without a forklift. Very much depends on the project.

Water gauging – water dosing is critical for consistent material and whilst it can be done with buckets, a tank with a pump and flow meter is easier, faster and more accurate.

Mixer - This should be mounted safely at suitable height to discharge directly into buckets or barrows. For most house-sized projects, the only viable mixer is a 800l capacity pan mixer. The capacity of the mixer is important as one bale of hemp is 200 lts and this needs twice that volume of space in the vessel to mix efficiently - most new build projects find a 2 bale mixer works best, hence 800l capacity is required.



Pan mixers can have various power sources –

1. diesel power pack - most flexible as it is self contained but needs fuelling (red diesel acceptable)
2. 415v 3 Phase electric motor_ obviously this requires a suitable supply, which you need to resource.

3. Directly driven from a PTO shaft when tractor mounted. There are a number available in the farming community.
4. Hydraulic gearbox - these can be powered from the hydraulic feeds on a site forklift, provided it is the compatible type of connections and ratings. This has the advantage of being able to deliver the material at various heights, as well as locations, if the site arrangement allows

As far as we are aware, there are few in existing hire fleets. Of those that are available, some have grinding wheels to reform existing plasters or mortar and this type is not suitable and most others have a very small capacity and are intended for small batches of material, not bulk.

Normal rotary drum mixers do not mix the material as well and they tend to “ball” the binder producing a variable rather than consistent mixed material. They are only capable of producing small quantities, which may be acceptable on certain, specialist projects. They cannot take a whole bale and consequently require volumetric batching of the binder and the hemp which is a further process and adds to the inefficiency of using small drum mixers.

Shuttering.

This can take any of many forms and the load on the shutters is much, much less than for concreting works. They can be made from 9mm OSB with a light frame of softwood but we have not yet found anything as convenient as the proprietary lightweight plastic system called Geopanel. There may well be other alternatives available. The Geopanel system has a simple twist bolt system and comes in a variety of sizes.



Small Tools and ancillaries – assuming you have the basic hammer, saw, measuring tape etc

Screws of suitable length to fit shuttering requirements. Spare driver bits to fit screw type.

Impact driver is the preferable tool but ordinary screw guns will work.

Horizontal battens and screws – to be fixed to the main frame as work proceeds every 600mm

Make up pieces of timber and ply for specific awkward areas.

Propping pieces for lintel support

Long and short levels, stringlines and plumb bob.

Tubs (35lt) and barrows for moving material from mixer to shutter.