

LIMESTRONG BUILD™

HIGH PERFORMANCE POZZOLAN + LIME

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Plaster Tools and Equipment

THE FOLLOWING IS A GUIDE to the tools and equipment you will need to gather in preparation for mixing, applying, and curing Limestrong Build™.

TOOLS

SQUARE POINT SHOVEL. Also known in the masonry and plaster trade as a No. 2 Square Shovel. This common shovel can be found at plaster supply and big-box home stores. Unlike a curved and pointed digging shovel, a square shovel is designed to move loose material—like sand. The flat bottom allows you to get at the sand at the bottom of the pile without cutting the ground sheet and/or scraping up the dirt beneath. The upturned edges allow you to load the shovel with a consistent mound of sand (or other material).

You'll want at least two square point shovels on the job—one stays with the sand pile^[XR1]. The other is used to move mud from wheelbarrow to mud tub/box, mud board, or bucket.

FIVE-GALLON BUCKETS. If you are mixing small batches of plaster^[XR2] (like LSB Finish), you'll use a five-gallon bucket to mix it in. Five gallon buckets can also be used for measuring sand and binder, carrying, lifting, and holding wet plaster, cleaning tools and so on. Don't skimp on having enough buckets on the job.

ONE-GALLON DIPPER BUCKET. Used to consistently measure the water for each batch.

WATER BARREL. A large, open-top plastic barrel is ideal for holding the mix water, allowing you easily fill the measuring bucket. The combination of a measuring dipper bucket and a water barrel will allow you to more efficiently and accurately get consistent mud batches.

MUD BOARD AND STAND. A mud board is a thick, 3-foot by 3-foot board^[1] that sits waist-high on a mud-board stand^[2]. The mud board is loaded with a mound of newly-mixed plaster from the wheelbarrow, from which the plaster applicator scoops the mud as needed from board to hawk.

MUD TUB. Also called a mortar tub or mortar box, a mud tub is useful when you need wet plaster handy to use where a wheelbarrow cannot go—like up on scaffolding. Or when a wheelbarrow is needed elsewhere and cannot serve as the tub. Some tubs even come with cart wheels attached.

Mud tubs are also ideal when working with a plaster sprayer, as the sides will contain the mud as you scoop-fill the sprayer hopper.

WHEELBARROW. Get the six-cubic-foot contractor's wheelbarrow, not the shallow, light-duty garden variety. Maybe get two. You'll have a choice between a tubed

AT A GLANCE

TOOLS:

Square Point Shovels
Five-Gallon Buckets
One-Gallon Dipper Bucket
Water Barrel
Wheelbarrow
Mud Tub
Mud Board and Stand
Hawk and Trowels
Scratcher
Corner Tools
Floats
Scoops
Darby
Scrub Brush
Water Hoses
Tank Sprayer
Personal Protection
Vinegar
Plaster/Stucco Tape

EQUIPMENT:

Mortar Mixer
Texture/Stucco Sprayer with Compressor
Scaffolding
Pulley System



FIG 09 - Spray-applying LSB Binder leveling coat over keyed scratch coat.

FOOTNOTES [0]

[1] A square of 3/4-inch plywood coated with a water sealer of some kind (to prevent the dry wood from sucking water out of the mud) works well.

[2] A folding X-shaped pipe or wooden stand with a length of chain to limit spread when open.

CROSS REFERENCES [XR]

[XR1] See LSB Publication: **Sourcing Sand**

[XR2] See LSB Publication: **Mixing Limestrong Build Plasters**

pneumatic tire or a foam-filled flat-free tire. Some claim pneumatic tires provide less rolling resistance; others prefer to not be fixing flats and airing up tires. As necessary, acquire wide planks to serve as ramps to facilitate safe, efficient movement of mud-laden wheelbarrows between mixer and walls.

TROWELS. Plaster or **stucco trowels** are long rectangles with square corners and some flex to the blade. The handle is aligned with the length of the trowel. They come in various sizes, but a 10-to-12-inch long by 4-to-5-inch wide version is typical^[FIG 01].

A **pool trowel** is a large (14 x 5-inch is typical), flexible trowel with rounded-off ends^[FIG 03]. Very useful for applying and working large walls of plaster. Many experienced plasterers do most of their exterior work using a pool trowel.

A **margin trowel** is a small, end-handled rectangular tool used to get into tight spots. Also works great for scraping.

A **pointing trowel** is a kite-shaped, pointy, end-handled tool used to reach places rectangular trowels cannot.

A **Venetian plastering trowel** looks similar to a standard plaster trowel, but a bit smaller and features radius corners and beveled edges. It is used to tighten and burnish a finish coat, typically when working with thin interior finish coats and fine-grained plasters. Rarely used for exterior work.

HAWK. A hawk is a square piece of metal, plastic, or wood (typically 13 inches) with a handle affixed dead center, perpendicular to the surface plane^[FIG 04]. You'll use the hawk, held horizontally, to hold wet plaster (mud), from which you'll load your trowel as you work along the wall.

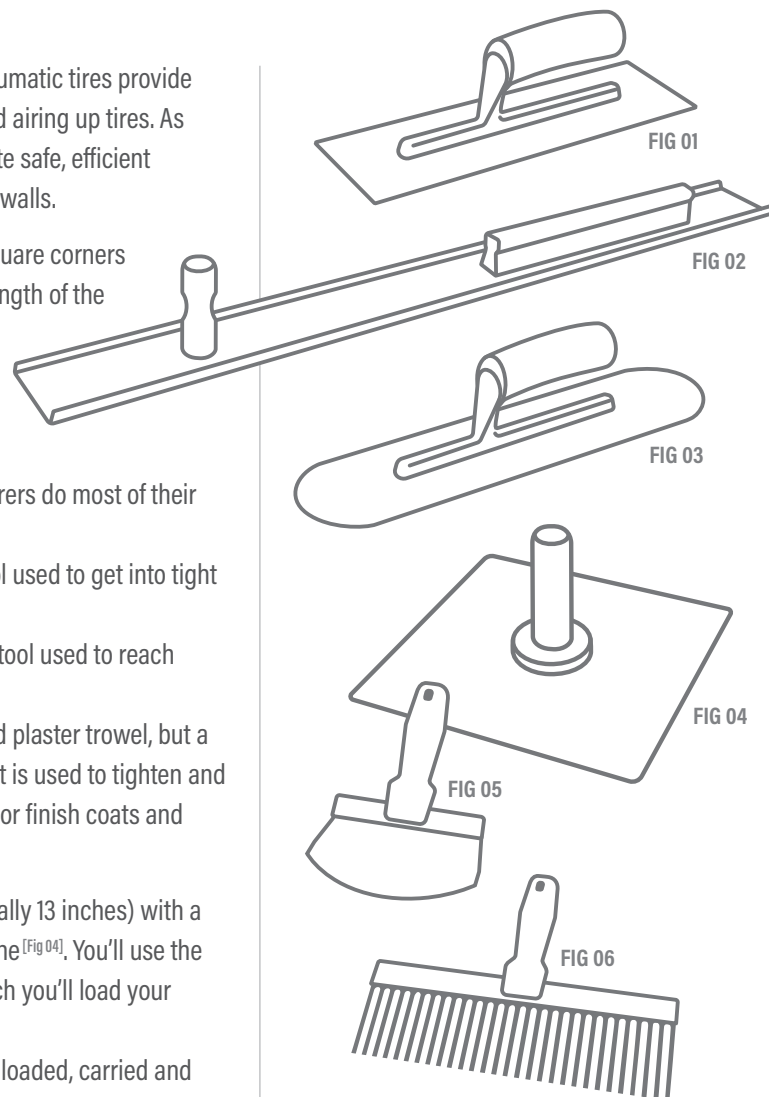
The hawk is easiest to use and balance when the mud is loaded, carried and balanced in the center of the hawk. Tip the hawk into the trowel and skim the mud with the trowel to load the trowel, then transfer the mud on the trowel immediately to the wall.

SCRATCHER / SCARIFIER. A multi-pronged tool used to make grooves in the initial scratch plaster coat^[FIG 06]. The roughened surface that results from lightly pulling a scratcher over the still-wet scratch coat provides mechanical grip, or tooth, for the brown (second/leveling) coat.

CORNER TOOLS. Corner shaping tools are used to achieve clean-looking freehand corners and curves. Straight-angle corner tools give a sharp, 90-degree corner. Rounded corner tools put a radius on the corner. Tools are made specifically to work either inside or outside corners.

FLOATS. Plasterers use a variety of floats to meet various purposes.

A **hard rubber float**, for instance, is used to float the brown coat. Using a circular motion, the lime plaster is compacted to minimize cracking and increase surface strength^[XR2]. The float surface allows for compaction while minimizing the chance of slicking (too smooth, too many fines brought to the surface, adversely affecting mechanical bonding of the finish coat) or burnishing the finish.



ILLUSTRATIONS:

- 01 • Plaster Trowel
- 02 • Darby
- 03 • Pool Trowel
- 04 • Hawk
- 05 • Scoop
- 06 • Scratcher
- 07 • Hudson-type Sprayer

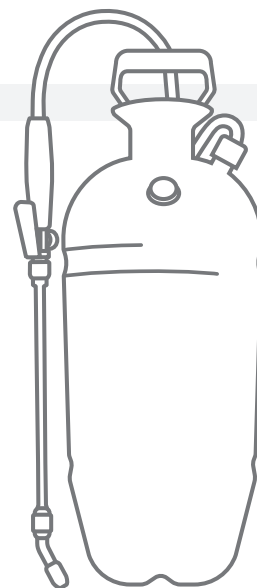


FIG 07

Sponge floats of different types and textures (designated by color) are used to feather edges and work wet mud into dry plaster when doing patches. They also provide certain types of finish textures, and even aid in cleaning the surfaces of other tools.

Plastic floats are used to create specific texture-finish types.

SCOOPS. Scoops of various types are used to transfer wet plaster (mud) from a wheelbarrow, mud tub, mud board, or bucket to the plaster's hawk. Scoops come attached to short handles or long handles (for deep buckets) and several scoop shapes, including those with a rounded face or leading edge to fit the inside curve of a bucket^[FIG 05].

DARBY. A darby is a 3-plus-foot-long by 3.5 inch flat metal bar with a pair of handles, one on each end^[FIG 02], with raised edges along the long sides for extra strength and durability. Darbys are used for leveling the plaster when a super-flat surface is wanted. In such cases, casing beads are also used, providing a surface for one end of the darby to ride on, bringing the plaster level and on-plane with the casing beads and control joints (if used). Plastering a straw bale house? You won't be needing a darby.

SCRUB BRUSH. A long-handled scrub brush is great for cleaning off tools and keeping your hands out of the wash water, which quickly grows alkaline as you wash lime plaster from the tools.

WATER HOSES. Get enough hose on the job to easily reach all points of the wall surface so the walls can be cleaned and/or moistened as needed between coats.

TANK SPRAYER. A portable, pressurized garden sprayer is ideal for gently misting the plaster (keeping it damp) as it cures. The basic Hudson-type sprayer^[FIG 07] consists of a tank with a pump handle on the top to pressurize the tank once it's filled. The wand at the end of the hose should have an adjustable tip that can be twist-set to spray a fine mist that will not etch the plaster surface. A back-pack-type sprayer works as well, especially when a lot of wall needs to be tended in hot and/or windy weather.

VINEGAR. White vinegar can be used to neutralize the caustic effect on lime on skin. Have a gallon available at the job site at all times.

PLASTER/STUCCO TAPE. Stucco tape comes in a variety of colors (with red being common) and has been specifically developed to stick to a variety of surfaces and protect and mask non-plaster areas—windows and doors and trim frames, posts and beams, vents, brick and stonework, painted surfaces—from plaster staining and damage. Good stucco tapes are also rated for how long they can be left adhered before becoming problematic to remove cleanly. Considering the longer cure times necessary for lime plaster, you'll want to use at least the 30-day-rated stuff. Some are also rated as UV resistant. It's important that you use a quality tape. The low-stick blue painter tape is just not up to the job, especially if tasked with holding plaster-splattered paper or plastic sheeting. Be sure to securely tape the drop clothes used to protect floors, concrete, flag stones and pavers as well.

PERSONAL PROTECTION

The lime in plasters and mortars is somewhat caustic (high in alkalinity), and the best way to prevent skin burns and stinging eyes is to wear protective gear^[XR3].

Eye Protection. You're going to want to shield your eyes, especially if you're using a sprayer. The alkalis in the lime and the abrasiveness of the sand are hard on eyes.

Skin Protection. The longer plaster mud stays on your skin, the more damage it does. Wear long sleeved shirts and long pants. A plastic or canvas apron is also a good idea—when mud gets on your clothing, alkalis from the mud soak into the cloth and then transfer through to your skin and often is not felt until the damage is done.

Gloves. Avoid cotton and leather gloves. They get wet and hold the alkalis against your skin. Moist skin burns more readily than dry. Best to keep you hands dry with some kind of waterproof glove. If you simply can't work with gloves, you'll need to rinse (and dry) your hands often. Many plasters keep a bucket of water cut with a healthy splash of white vinegar handy to counteract the bite of lime alkalis on skin and tools.

A thorough shower at the end of the day gets all the alkali salts off your skin.

CROSS REFERENCES [XR]

[XR3] See LSB Publication: **Safe Use Precautions and Treatments**

EQUIPMENT

MORTAR MIXER. Make sure you are renting (or buying) a mortar mixer^[FIG 08], and not a cement mixer^[3]. A mortar mixer has a fixed tub with a bladed horizontal shaft that turns during the mixing process. The entire tub is locked into place during the mixing process. The tub is covered with a screen deck affixed with bag-cutting blade. The mixed plaster (called mud) is then discharged from the mixer by unlocking the pivot hinge, and, with the blades still turning, rotating the tub down to dump the mud into the wheelbarrow.

Mortar mixers come in different batch size capacities. For the most efficient mixing, you want your lime plaster batches to only fill the mixer enough to cover the horizontal shaft—you don't fill it full. Also know that while your typical contractor-type wheelbarrow is sized to hold up to six cubic feet, you don't want to load it completely full either. So, choose a mixer size that meets the needs of your crew and the demands for mud. For a small crew, a single wheelbarrow load at a time is plenty, which means a six or seven cubic foot capacity mixer will do the job.

Typical rental mixers come in 6-cubic foot to 12-cubic foot capacity, sit on an axle so they can be towed, and are either electric or gasoline powered.

If you're renting (or borrowing), ensure the mixer is clean^[4] and in good repair, including tight belts (if so equipped), oil in the transmission (if so equipped), working tub-locks, functioning safety guards, and so on. When you turn on the mixer, the paddle in the mixing tub should turn without scraping. Know that a mortar mixer is the most hard-used (and abused) piece of equipment on the job site. Choose well.

TEXTURE / STUCCO SPRAYER. Stucco/mortar sprayers^[FIG 09] are pneumatic tools (fed by compressed air) consisting of a scoop-shaped hopper with an upper control handle and an air-supply inlet handle at the bottom with a squeeze-bar trigger to blow compressed through the wet plaster mud (consistency of thick milk shake or peanut butter) and out the holes in the bottom face of the hopper. The operator loads the hopper by scooping mud from the wheelbarrow or mortar tub directly into the hopper, points the hopper at the wall, and triggers the compressed air to splatter the mud against the wall. A second person comes along behind and trowel-compacts the mud to the appropriate finish for the coat being applied. For large jobs, a sprayer gets mud on the wall much quicker than someone with a hawk and a trowel, but you must have enough skilled help to keep pace with the follow-up troweling and supplying the mixed mud^[XR4].

A powerful **air compressor** will be necessary as well—check the sprayer manufacturer's recommendations for compressor horse-power and CFM.

Take care to securely **mask off**^[XR4] windows, soffits, vent grates, trim, and any other surface where you do not want plaster.

SCAFFOLDING. When plastering tall walls, you are going to need to set up scaffolding. Plastering *should never be done* working from a ladder. Not only is applying plaster from a ladder dangerous, it is incredibly inefficient. Scaffolding can be readily rented from a local equipment rental outfit. You'll want to set up the scaffolding close enough to the wall (but not against it) to comfortably reach the surface of the wall when standing in the inner third-to-middle of the scaffolding deck. Take care to provide adequate base support under the legs so the scaffolding stays stable when loaded and against movement.

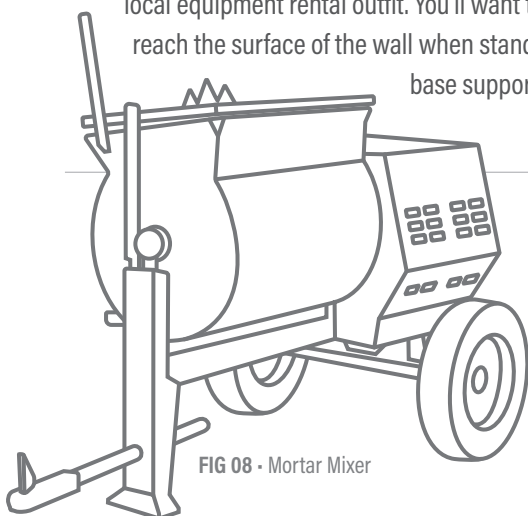


FIG 08 - Mortar Mixer

FOOTNOTES [0]

[3] A cement mixer is a rotating tub with baffles attached to the inside. It relies on large aggregate (3/4-inch stones) and a more fluid mixture overall to work effectively. A cement mixer will not serve to mix lime plaster.

[4] If the mixer has a crusty build-up of dried plaster on the inside of the tub or on the mixing blades, you'll most likely be getting broken-off chunks of it from time to time in your batches—very frustrating for the trowel guy.

CROSS REFERENCES [XR]

[XR3] See LSB Publications: **Safe Use Precautions and Treatments;** Limestone Build **Safety Data Sheet (SDS)**

[XR4] See LSB publication: **Lime Plaster Application Guide**

PULLEY SYSTEM. When you're working off the ground, you're going to need a way to get wet, heavy mud up on the scaffolding deck and into the mud tub. Tying a fat rope onto the bail of a bucket and pulling it up (known as hand-lining) works, but it's not the safest or most efficient method, especially if you're spraying, increasing the demand for more mud more often.

A pulley system consists of a triangular swing hoist arm, a pulley wheel, and an extension bracket to attach the entire assembly securely to the scaffolding. Use at least a half-inch diameter rope, as it's much easier to grip and control. For added safety, use a system with braking built into the pulley mechanism. Know that installing a hoist arm/pulley assembly will alter the load on the scaffolding at that point, so adequately brace for it.

KEEP TOOLS AND EQUIPMENT CLEAN

Cleaning tools and mixing equipment often is an exercise in prevention. It's much easier to remove wet and damp mud from tools rather than trying to chip and knock it off when it is dry and hard. A good practice to follow: thoroughly clean tools and the mixer right before breaking for lunch, then again at the end of the work day^[XR4].

SAFE USE PRECAUTIONS



Limestrong Build™ plasters contain hydrated (slaked) lime, which (because of a high pH) is somewhat caustic. Breathing the powder dust can also cause respiratory irritation. BE SMART. Protect yourself^[XR3]. In all situations, if irritation develops, seek medical attention. Please read the complete **Safe Use Precautions and Treatments** publication for information on protecting and treating skin, eyes, and breathing function.