DRY MORTAR SILO GUIDE

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TILLICOULTRY QUARRIES
MORTARS & RENDERS LTD.

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1.INTRODUCTION

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As Scotland's only independent dried mortar producer, Tillicoultry Quarries Mortars & Renders ltd. provides the most diverse range of products within the industry combined with the best quality and back-up service, as part of Tillicoultry Quarries.
This silo guide will provide all the information you will need to prepare your site accordingly.

1.1 What are the main characteristics of dried mortar?

Increased Productivity
Less time mixing and more time applying
Quality assured
All products manufactured under a registered ISO 9001 Quality System
Environmentally Friendly
Large silo capacity means fewer deliveries throughout the duration of the project
Less pollution compared to using traditional mixes and methods Minimal or no waste

1.2 What are the advantages of silos?

- Completely sealed – the ultimate Health & Safety solution
- "On-tap" use as required, with little to no waste
- Very little space required
- Efficient transport
- After training, supports operation efficiency

1.3 What are the main benefits of dried mortar?

- Improved productivity on site
- Guaranteed quality of mix
- Minimal or no waste
- Optimum safe practices
- Environmentally friendly

2. PRE-PLACEMENT REQUIREMENTS FOR SILOS

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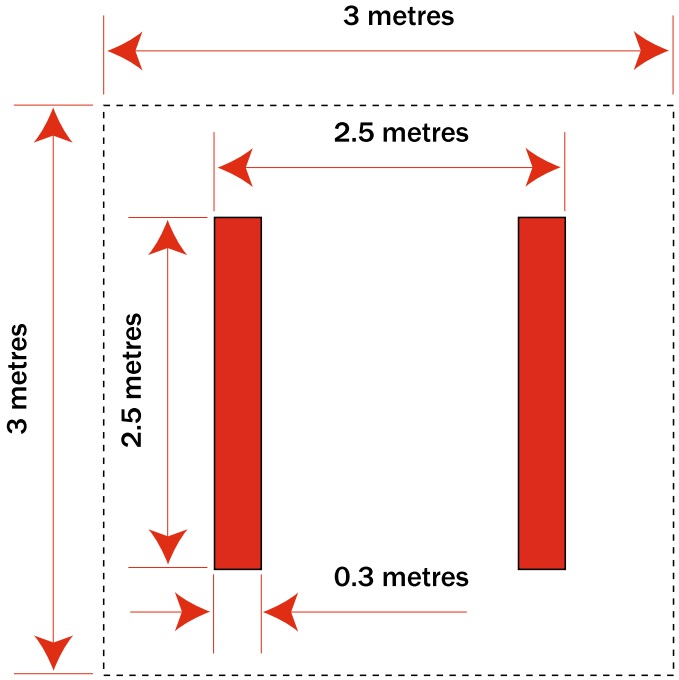
2.1 Site Survey

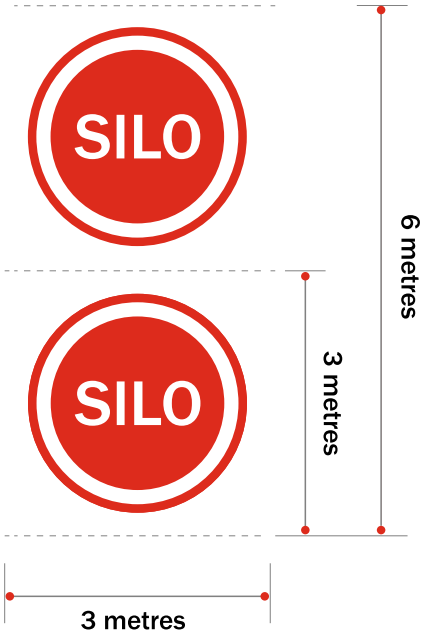
Tillicoultry Quarries Mortars & Renders ltd. will provide the site with the requirements for the delivery and use of the silo ensuring suitable access for all placement and delivery vehicles is in place.
Customers are responsible for designing a suitable site base whilst taking site safety into consideration.
Silos cannot be provided to sites that do not comply with these requirements.

FOUNDATION

Customers are responsible for designing a suitable site base. Please take site safety into consideration.

- Maximum Weight Filled = 40.0 tonnes
- Weight of Empty Silo = 2.2 tonnes
- Weight of Empty Silo + Mixer = 2.7 tonnes





2.2 The Support Base

All bases should be a minimum of 150mm above ground level.
The area must be free from the effects of running water and erosion. Prior to placing the silo, the following should be considered:

- Adverse Ground conditions
- Areas exposed to extreme weather conditions, i.e high winds

In addition

- No movement of the silo must be carried out after placement without permission and support of the Tillicoultry Quarries Mortars & Renders ltd. team
- Access to the silo must be maintained at all times in areas controlled by site
- The site is responsible for provision of safe access for deliveries and collections and all signage in relation to this
- If required seek further advice from a structural engineer to comply with the above
- The customer is responsible for the safe access for delivery, collection of the silo, refilling and taking note of all safety signage on silos.

2.3 Electrical Requirements

Three Phase Mains

The silo will arrive ready for connection to an industrial 3-phase 5 pole switched socket provided by the site. This socket must be 16A 5 pin weatherproof (supplied from a 16A 3-phase motor rated MCB type C or D).

The electrical supply to the silo must also be protected by a 30mA RCD exclusively for the silo. This should be placed within 5 metres of the silo legs. The link cable, plus and socket should be of a suitable rating and mechanically protected (SY type).

The plug and socket should have an IP rating of no less than 67 to prevent water ingress. It is the responsibility of site to provide these items and ensure they are protected from damage and the elements when not in use.

Single Phase Mains*

The connection from the mains requires a 32A single phase 3-pin industrial socket, which must be provided from a 32A motor rated MCB type C or D.

The electrical supply must be protected by a 30mA RCD exclusively for the silo.

3-phase mains is always recommended, so please check with our team for availability of single phase if there is no other option at your site.

It is the responsibility of site to provide these items and ensure they are protected from damage and the elements when not in use.

Generator

Where no power is available, a 3-phase generator with a minimum capacity of 12kVA (fitted with a 16A 5-pin industrial socket from a 16A 3-phase motor rated MCB. type C or D) is also sufficient to run the silo.

It is essential when this is used the control panel isolator is switched off before the generator is shut down. Failure to do this will result in costly repairs to the electric components of the control panel. Likewise, the generator must be started before the control panel isolator is switched on.

2.4 Water Requirements

A standard ½" tap located within 5 metres of the silo is required and the integral water pump on the control panel will provide the necessary pressure for the mixing unit. If the direct pressure from the mains supply is sufficient it can be fed via a 25mm hose. Where poor pressure is experienced a 60 litre storage barrel controlled by a ball cock can be fitted to provide a steady flow of clean water.

Silos can be run off a bowser. Our representative can advise of this and the relevant connections.

3. DAILY USE AND RE-ORDERING

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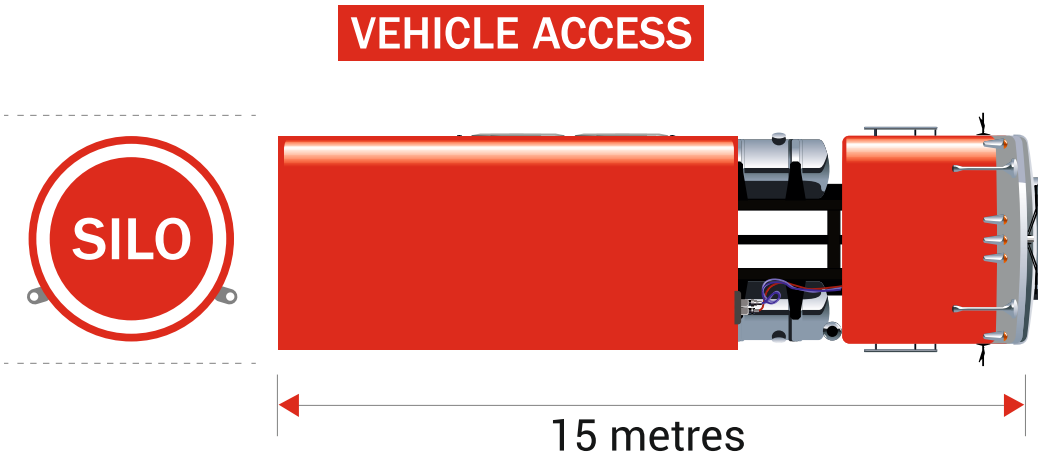
3.1 Delivery

The silo will arrive containing 12 tonnes of material and will be refilled by rigid or an artic tanker.
To prepare for delivery there should be:

- Unobstructed access to the silo at all times
- A concrete level base capable of carrying a gross weight of 40 tonnes
- Headroom of 4.2 metres
- Minimum width of 3 metres
- Conforming to site rules to avoid any delays

All unreasonable delays will be chargeable under the terms and conditions of the hire.



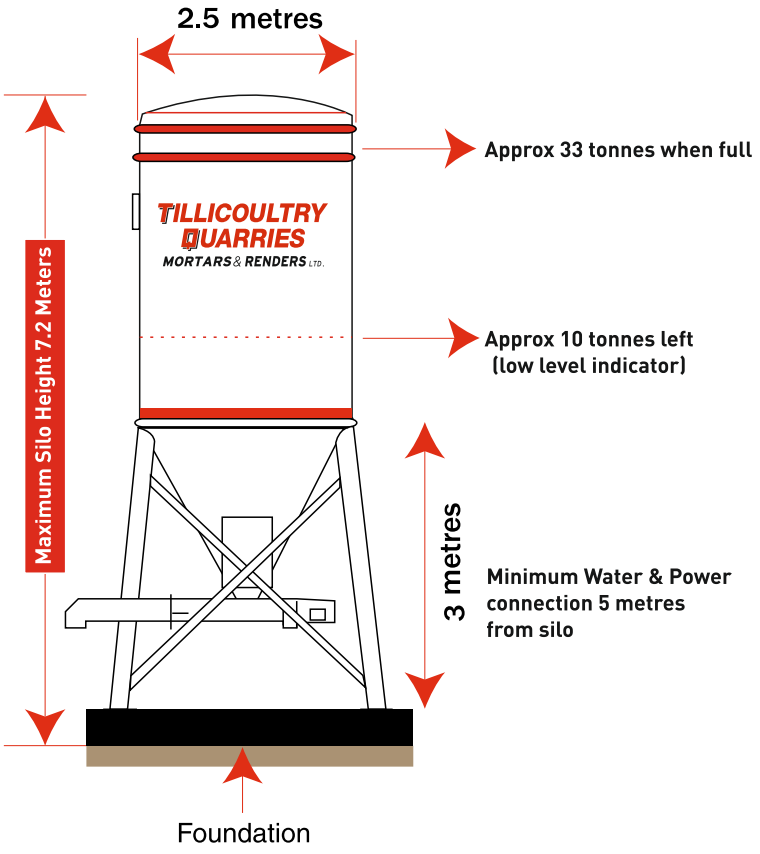
3.2 Re-ordering

When re-ordering, please provide us with:

- Your site location
- Your silo number e.g. K2219
- Your name and contact number
- The date delivery is required (subject to lead times at the time of ordering)
- Any changes to the site set-up

It is the responsibility of site to order within the quantities of an official order. Any material ordered beyond that will be expected to be paid for through an amendment or re-issue of the original order.
Your silo will require to be checked regularly for the level of mortar within it and learning how to carry this out will be part of our Operator Training (see section 3.4).

You can also monitor this over time by calculating your tub use. Each 0.25m³ tub contains approximately 340kg of mortar, so 10 tubs is approximately 3.4 tonnes used.
It is the responsibility of site to monitor these levels through their Trained Operatives. Any material which is over-ordered cannot be credited and may incur disposal charges.



3.3 Operator Training

All nominated personnel will be trained by our Engineers and a Training Certificate will be issued to all those trained.
Only these authorised individuals should operate the silo to ensure safe and efficient working practices.
It is the site manager responsibility to notify Tillicoultry Quarries Mortars & Renders ltd. of any additional training requirements

The full induction procedure covers:

- Familiarisation and Function of Silo Mixer Components
- Operation of the Electrical Control Panel
- Silo Mixer & Electrical Panel Isolation & Lock off Procedure
- Reset of silo electrical panel breakers & function of breakers
- Operation of silo water pump box and winter storage
- Silo set up and safe operation
- Silo daily wash out procedure
- Silo Mixer Weekly Clean out Procedure
- Silo Mixer Rebuild Procedure
- Silo breakdown procedure
- Silo Housekeeping Procedure

3.4 Vehicle Waiting Time

For all mortar and render silo placements/uplifts and bulk tanker deliveries waiting time charges may apply.

4. USING YOUR SILO

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The silo should not be used until it is fully commissioned and Operator Training Certificates have been issued.
THE SILO MUST BE ISOLATED AND MAINS POWER REMOVED WHEN NOT IN USE AND BEFORE ANY MAINTENANCE OR CLEANING TASKS ARE CARRIED OUT

4.1 Start Up

When using for the first time and every subsequent use
- Place the tub under the discharge tube
- Connect power cable and switch the control panel on
- Connect the water
- Run the mixer to check the direction is OK
- Run the mixer
- Open the butterfly valve on the silo
- Adjust the water as required

The mixer works mostly off a timed run started by pressing the green button. It will stop automatically after the set time.
Please ensure there is sufficient space in the tub to ensure the mixer outlet does not choke.

4.2 Daily Cleaning

At the end of the day and before collection you must:
- Close the butterfly valve on the silo
- Run out all of the remaining material in the mixer
- Run mixer empty for approximately 5 minutes until clean water is discharged
- Disconnect the water and remove the control panel to overnight store

4.3 Weekly Cleaning

This procedure is essential to avoid repair bills:
- Carry out the daily cleaning procedure
- Isolate from the power source
- Remove the front mixing tube and screw
- Clean thoroughly
- Reassemble to keep dry

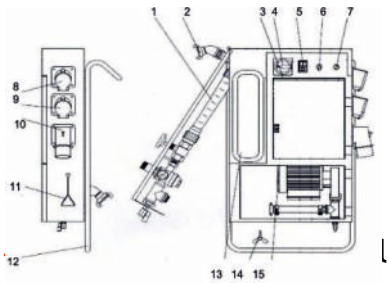
Please note: these procedures must be followed thoroughly to avoid severe damage to components

4.4A Control Panels in Cold Conditions

Freezing water can cause serious damage to the panel and fittings and cause downtime on site.
In addition to storing the panel in a frost-free environment when not in use, please do the following:
- Turn off the water supply
- Uncouple the water supply pipe
- Uncouple the pipe from the mixing chamber
- Open the drain taps
- Turn the control switch to brush position
- Drain the water completely

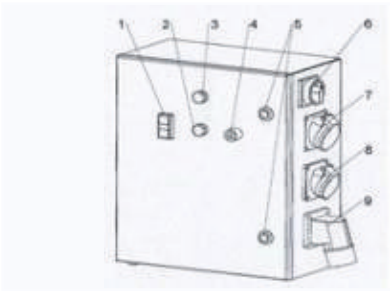
4.4B Control Panels

Your silo will be fitted with one of the two options - here is an outline guide reminder - for 3 phase RED sockets & plugs for single phase BLUE sockets and plugs



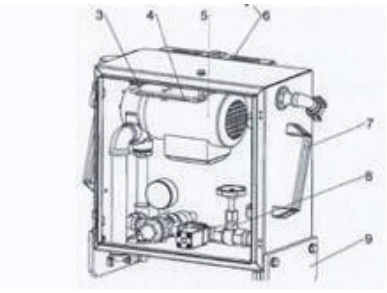
1. Flow Tube
2. Water Inlet
3. Electrical Cabinet
4. Isolator Switch
5. Start / Stop
6. Wash Out Switch
7. Indicator Light
8. Motor Socket
9. Vibrator Socket
10. Power In
11. Phase Change Screwdriver
12. Mounting Bracket
13. Viewing Glass
14. Bleed Valve
15. Water Pump

Please note: the control panel must be kept in warm, dry conditions overnight or when not in use.
Any repairs to control panels damaged by frost will be chargeable - prevention is the key as these repairs can be very expensive.



Electrical Cabinet

1. Start / Stop
2. Trip Indicator
3. Phase Indicator
4. Panel Reset Key
5. Panel Locks
6. Isolator Switch
7. Mixer Motor Socket
8. Vibrator Socket
9. Mains Inlet



Water Pump

3. Pump Bracket
4. Pump Bracket
5. Water Pump
6. Panel Mounting Bracket
7. Lifting Handle
8. Water Control Solenoid
9. Mounting Bracket

5. ADDITIONAL INFO

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5.1 Warm Weather and Lime Mixes

During warm weather there is a possibility the silo material could set quicker than normal, and this may require more frequent flushing of the mixer.

If damage occurs:

- Report all damage or changes to the silos immediately
- Follow the procedures to ensure smooth running
- Work with your contact to avoid chargeable repair

5.2 Use by Recommendations and Soluble Chromium

To minimise the occurrence of chromate-related allergic dermatitis arising from the use of cement, a reducing agent has been added limiting the amount of soluble chromium (VI), when hydrated (mixed with water), to a maximum of 2 ppm (0.0002%) by mass of dry cement.
If used within 6 months from the date of production this level can be maintained. When used after this date it may increase the risk of an allergic reaction. It may also be illegal to use material after this time.
We would recommend that the maximum storage time
of all types of silo based cementitious products, both white and grey does not exceed 6 months from the delivery date for the purposes of soluble chromium control and for general product performance.
The effectiveness of additives, pigments and the durability of the product may be significantly affected if this time limit is exceeded.
Appropriate PPE must be worn at all times, subject to the MSDS.

In addition to the site PPE rules, when handling this silo product the following additional PPE should be considered and reference made to the Material Safety Data Sheet (MSDS)

FFP3 Mask to be worn

Eye Protection to be worn

Face Protection to be worn

Impermeable Gloves to be worn

For all matters relating to orders, training, maintenance or breakdowns

Call 01294 557515 or email mortarsandrenders@tillicoultryquarries.com