MORTAR: STRENGTH TESTING & PRISM PREPARATION

The procedure for the preparation of mortar and render prisms is set out in I.S. EN 1015-11 'Methods of test for mortar for masonry – Part 11: Determination of flexural and compressive strength of hardened mortar'. See our step-by-step guide below.

Roadstone Flomix and Trowel Ready mortars and renders are accurately batched in our purpose-built plant to I.S. EN 998-1 & 2 'Specification for mortar for masonry – Part 1: Rendering and plastering mortar & Part 2: Masonry mortar', under a registered Quality Management System to I.S. EN ISO 9001. The traditional mix designs used are as set out in the National Annex to Eurocode 6, I.S. EN 1996-1-1 'Design of masonry structures – Part 1-1: General rules for reinforced and unreinforced masonry structures (Including Irish National Annex Table NA.3)' and S.R. 325 'Recommendations for the design of masonry structures in Ireland to Eurocode 6'. All Roadstone mortars are CE marked products and are tested to ensure they comply with Roadstone's exacting quality standards.

SITE vs LABORATORY

I.S. EN 998-2 states the following: "The characteristics of mortar are specified under laboratory conditions and cannot always be directly compared with the characteristics obtained under site conditions". While it is a simple process to prepare the mortar prisms, the laboratory storage conditions can be difficult to replicate on site. These storage conditions are essential for optimal cement hydration and mortar strength gain. Laboratory trials have demonstrated that correctly stored mortar prisms can achieve 50% greater compressive strength versus incorrectly stored mortar prisms.

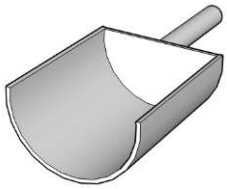
PRISM vs CUBE

As per I.S. EN 998-2 mortar compressive strength is now specified and assessed with 40×40×160mm prisms and the 100mm cube is no longer valid. In accordance with the withdrawn I.S. 406 'Masonry mortars' the prism and cube compressive strength of the standard prescribed mortar mixes available may be compared as follows:

Mortar	Proportion of Constituents by Volume		Strength (N/mm^2)	
	Cement:Sand	Cement:Lime:Sand	Prism	Cube
M4	1 : 5 to 6	1 : 1 : 5 to 6	4	2.5
M6	1 : 3 to 4	1 : ½ : 4 to 4½	6	4.5
M12	1 : 3	1 : 0 to ¼ : 3	12	11

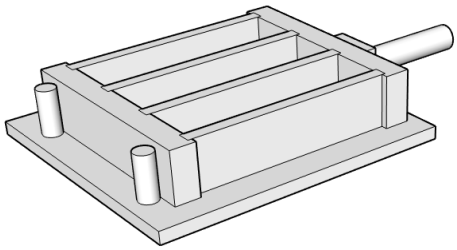
APPARATUS

BUCKET

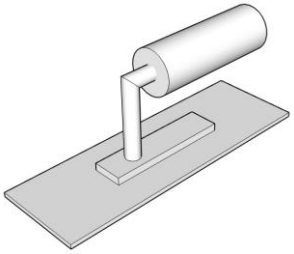


SCOOP

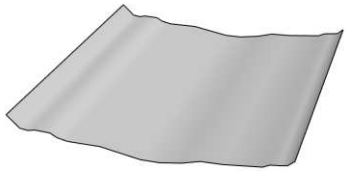
10MM TAMPER BAR



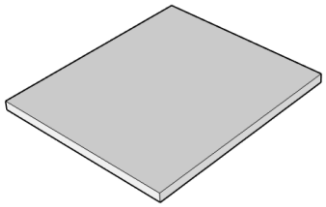
3-GANG PRISM MOULD



TROWEL



POLYTHENE



FLAT PLATE

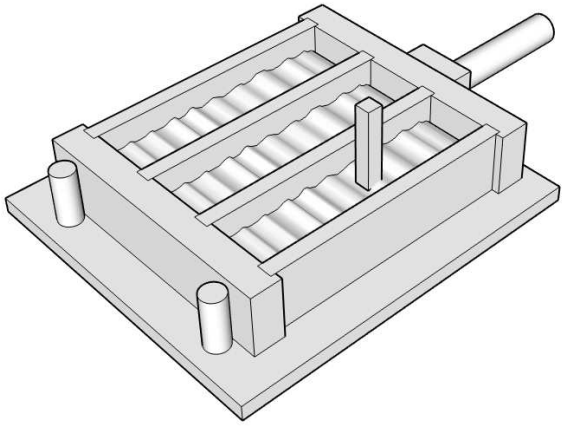
ZIP-LOCK BAG

PROCEDURE

Follow the procedure below when preparing mortar prisms. Ensure that appropriate PPE is worn when handling mortar. For more information see our Material Safety Data Sheet on **www.roadstone.ie**

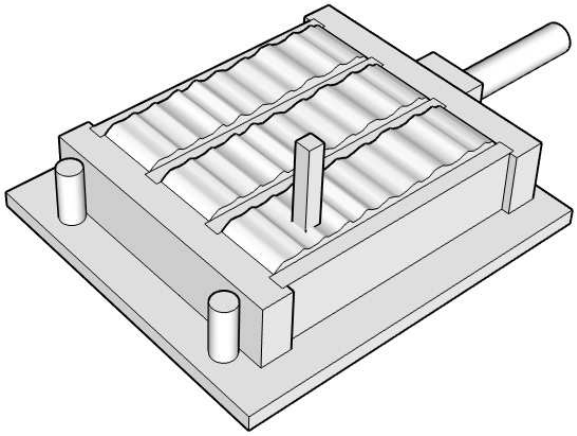
STEP 1

- Sample the mortar while it is being discharged by the ready-mix truck or Flomix mixer
- To ensure that the sample is representative at least 6 scoopfuls should be taken, evenly distributed throughout the load
- Combine in a bucket and mix thoroughly



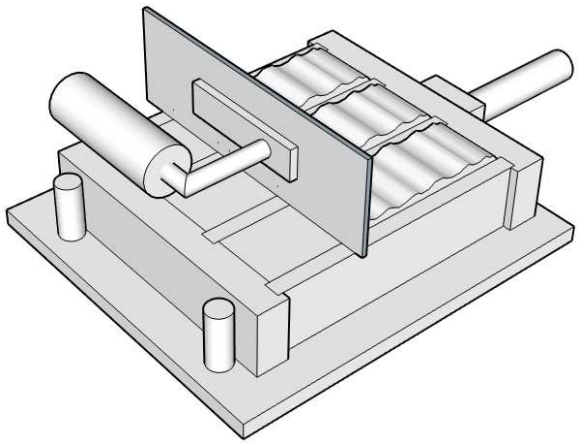
STEP 2

- Ensure moulds are correctly assembled, clean and lightly oiled
- Half fill each mould gang with mortar
- Compact the layer with 25 strokes of the tamper bar per gang



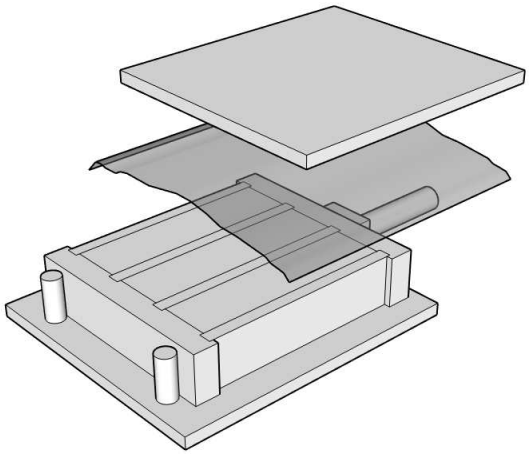
STEP 3

- Fill each mould gang with mortar until it is overflowing
- Compact the layer with 25 strokes of the tamper bar per gang, taking care to just penetrate the layer beneath



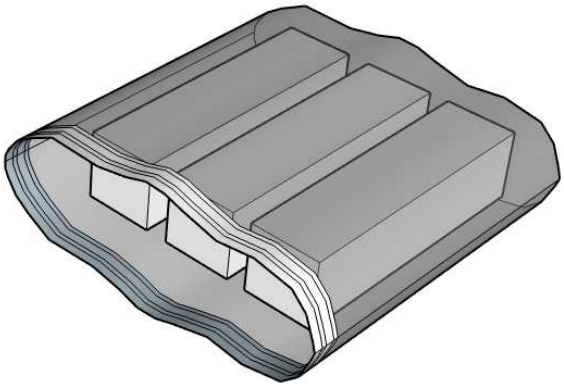
STEP 4

- Remove the excess mortar
- Smooth over with a straight edge trowel
- Wipe clean the mould edges



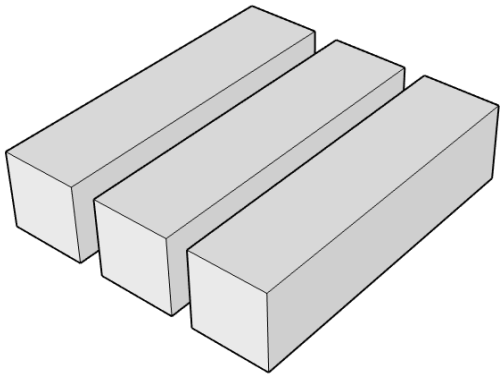
STEP 5

- Cover the mould with a clean piece of polythene
- Place a flat plate on top of the polythene
- Take care not to disturb the fresh mortar and ensure the polythene is adequately sealing the mould
- Store the mould at 20°C for 2 days



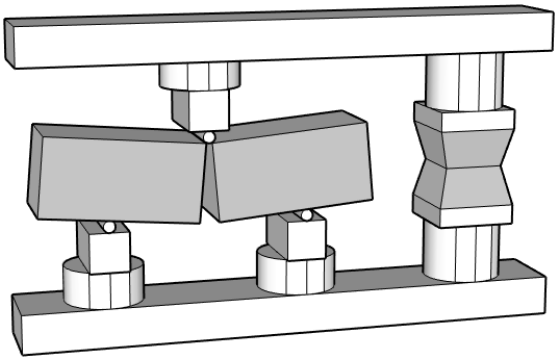
STEP 6

- After 2 days the prisms should be removed from the mould
- The prisms are still very weak at this stage so care should be taken to avoid damage
- Place the prisms immediately in to a zip-lock bag and seal tightly to retain any moisture
- Store the bagged prisms at 20°C for 5 days



STEP 7

- After 5 days the prisms should be removed from the bag
- Store the loose prisms in a humidity cabinet at 20°C and 65% RH for 21 days
- In the absence of a humidity cabinet the loose prisms should be stored at 20°C in a sheltered indoor location away from any direct heat source



STEP 8

- At 28 days the prisms should be tested for flexural and compressive strength
- All 3 prisms should be tested for flexural strength
- All 6 resultant half prisms should be tested for compressive strength
- Average the values obtained

For more information on our range of mortars and renders including product information, technical guidance documents and Declaration of Performance see **www.roadstone.ie**