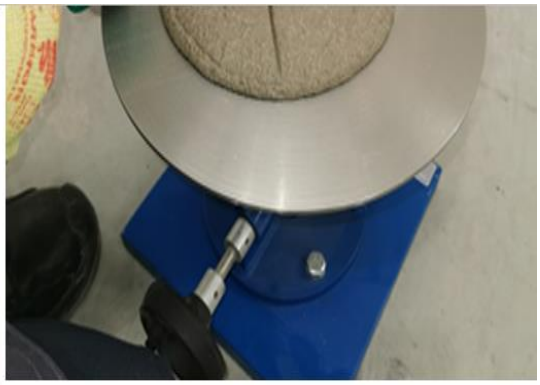
Kilsaran KPRO MASONRY

GUIDANCE **DOCUMENT**

Site Sampling & Testing of Masonry Mortars



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MASONRY MORTAR – Site Sampling & Testing

Background

Kilsaran KPRO masonry mortars are designed masonry mortars, manufactured in accordance with I.S. EN 998-2:2016 *Specification for Mortars for Masonry – Part 2: Masonry Mortars*. Our masonry mortar products hold third party factory production control system 2+ certification and should be used in accordance with EN 1996 *Eurocode 6 - Design of masonry structures* and SR 325 *Recommendations for the design of masonry structures in Ireland to Eurocode 6.*

The current documented procedures for testing mortars is I.S. EN 1015 *Method of Test for Mortar for Masonry* and consists of 21 parts. Whilst a number of these test methods are undertaken by the mortar producer, a limited number are practicable on the construction site. For day to day routine testing, construction sites and associated personnel typically monitor the flexural and compressive strength of the mortar.

It is important to note that the products fresh and hardened characteristics declared by the manufacturer are based on laboratory conditions and cannot always be directly compared with the characteristics obtained under site conditions (Ref: section 5.1 I.S. EN 998-2:2016).

When determining the flexural and compressive strength of mortars there are 3 factors that can directly affect the test outcome. These are sampling, making of test specimens and storage of test specimens.

- Sampling – I.S. EN 1015 Part 2
- Determination of Consistence by Flow – I.S. EN 1015 Part 3
- Making of test specimens – I.S. EN 1015 Part 11
- Storage of test specimens – I.S. EN 1015 Part 11

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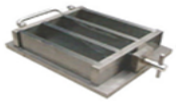
1. Equipment Required

The following is a list of equipment required to successfully sample and test masonry mortars on site, in accordance with current standardised methods,

	Metal or rigid plastic receptacle/scoop with a capacity ≥ 1 litre
	Metal trowel/float
	Clean, dry non-absorbent container with close fitting lid and a capacity to hold 10kg of fresh material
	Flow table, conical mould and tamper in accordance with EN 1015-3 specifications
	Non-absorbent tamper with circular cross section of 40mm and approximately 200mm long, with a mass of 0.250kg ± 0.015kg
	Metal 3 gang prism mould for making 160 x 40 x 40 test specimens
	Non-absorbent tamper with square cross section of 12mm ± 1mm, with a mass of 50g ± 1g.
	Sealable polythene bags capable of holding filled prism moulds

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2. Sampling

When sampling from a Kilsaran silo, sample the mortar at the silo discharge point by passing the receptacle/scoop through the stream of mortar taking not less than 3 increments to collect a representative bulk sample.

When sampling from a KPRO 25kg bag of material, fill a clean non-absorbent container with the required amount of clean potable water (as noted on the reverse of bag). Then mix the entire contents of the bag using a suitable paddle drill by adding it gradually to the mixing water to obtain a representative bulk sample.

When sampling trowel ready mortar from a Kilsaran mixer truck, sample the mortar at the truck discharge chute by passing the receptacle/scoop through the stream of mortar taking not less than 3 increments to collect a representative bulk sample.

Once the sample has been obtained, mix the increments together and place the entire sample in a clean dry container and secure the lid.

Immediately after collecting/obtaining the bulk sample, using the receptacle/scoop combine and thoroughly hand mix the increments on a flat non-absorbent, rigid surface. Reduce to sample to produce a bulk test sample of not less than 10kg by taking scoopfuls from random positions throughout the mixed material.

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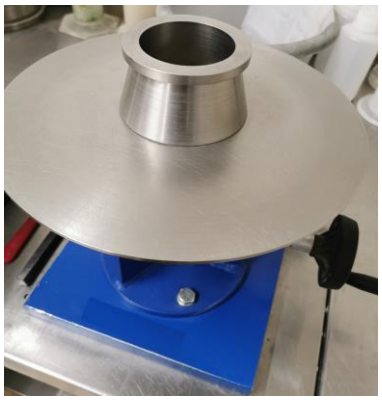
3. Determination of Consistence by Flow

As per the requirements set out in Table 2 of I.S. EN 1015-2 (*Sampling*) the consistency of the mortar for testing must have a flow value of 175mm ± 10mm. Test method EN 1015-3 sets out the procedure and is as follows,

Step 1

Place the conical cone centrally on the plate of the flow table.



Step 2

Fill the cone in approximately 2 equal layers compacting each layer 10 times (round cross-section tamper)

Step 3

Once the cone is filled strike off the excess and after approximately 15 seconds lift the cone.

Step 4

Jolt the table 15 times and measure the flow/spread of the mortar in two directions to the nearest mm. Record your result.

Step 5

If the material is outside the 175mm ± 10mm discard the sample, adjust the silo water settings and take a new sample.

MASONRY MORTAR – Site Sampling & Testing

4. Preparation of Test Prisms

The flexural strength of mortar is determined by three point loading of hardened moulded mortar specimens to failure. The compressive strength of the mortar is determined on the two parts resulting from the flexural strength test. The test specimens shall be 160mm x 40mm x 40mm prisms. 3 specimens should be provided. The 3 specimens shall be tested for flexural strength which involves breaking them in half. The compressive strength test is carried out using the 6 half prisms. Test method I.S. EN 1015-11 sets out the procedure as follows,

Step 1

Assemble the clean and lightly oiled 3 gang prism mould ensuring it is secure and ready for the test.

Step 2

Half fill each mould and compact with 25 strokes of the 12mm square tamper.

Step 3

Fill the remainder of each mould (total of 2 layers) and compact with 25 strokes of the 12mm square tamper.

Step 4

Strike of the excess with a clean trowel to leave a smooth level surface.

Step 5

Record all relevant test data such as date and time of sampling, sample source, sample flow value etc. on the specimen test record.

Step 6

Place the prisms (in the mould) into a sealed polythene bag to store prior to testing (see section 5)

*** Note:** A minimum of 3 prisms are required for 28 day testing. If early strength prisms are required these should be in addition to the three 28 day specimens.

5. Storage of Test Specimens

Once the test specimens have been prepared their storage is of critical importance. I.S. EN 1015-11 sets out the storage conditions required per mortar type. The below table reaffirms these conditions.

Type of mortar	**Storage time at a temperature of 20 °C (+3 °C/-2 °C) in days**		
	Relative humidity		
	95 % ± 5 % or in polyethylene bag		65 % ± 5 %
	in the mould	with the mould removed	with the mould removed
Mortar with hydraulic binders	1-3	Until a total of 7 d in the storage chamber or polyethylene bags	21
Retarded mortars	7	-	21