Mortar binds bricks and blocks together to give strength and stability to a wall. Freshly mixed mortar must be soft and flexible, so that it spreads easily and makes good contact, without becoming too strong in its hardened state. Too strong a mortar may crack and is wasteful, as it is more expensive.

**Selecting materials**

The properties of mortar in both the fresh and hardened states depend to a large extent on the properties of the materials used. This section gives guidance on selecting materials.

**Cement**

All AfriSam Cement products comply with SANS 50197-1 and bear the SABS mark. For instructions on making high quality mortar mixes, refer to AfriSam Cement product brochure for the particular AfriSam product being used.

**Sand**

Sand is by far the major constituent of a mortar mix and has a significant influence on its performance and material cost. The sand should be clean (grass, leaves, roots and other foreign matter are harmful) and it should not contain too much clay. It should consist of hard particles ranging in size from dust up to about 2 mm. Pit sands generally have these characteristics. Dune and beach sands are often too uniform in size (single sized) to give good results.

**Lime**

Building lime should be used if the sand lacks fine material or is single sized, as such sands tend to produce mortar with poor workability. The amount added to the mix may be as much as the amount of cement by volume and site trials is advisable.

Note: The limes used in South Africa do not have cementing properties. They can therefore not be used to replace cement but are used in addition to cement.

**Mix proportions**

The proportion of each material in the mix should suit the type of work being done. Strength classes and corresponding mix proportions are given in AfriSam Cement product brochure for the particular product being used.

In general terms there are three classes of mortar.

**Class I**

Highly stressed masonry

Incorporating high strength structural units, as used in multi-storey load bearing buildings and walls exposed to severe dampness.

**Class II**

Mix A

Exterior/Exposed to dampness.

**Class III**

Mix B

Interior/Dry.

**Quantities**

**Exterior Quantities for masonry units - exterior/damp**

<table>
<thead>
<tr>
<th>Masonry unit type</th>
<th>Masonry unit size (mm)</th>
<th>Masonry units per m² (single leaf wall)</th>
<th>Per 1000 units</th>
<th>Per 100m² of walling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard brick</td>
<td>222 106 75</td>
<td>12</td>
<td>0,72</td>
<td>0,83</td>
</tr>
<tr>
<td>Maxi-brick</td>
<td>290 140 90</td>
<td>13</td>
<td>0,33</td>
<td>0,37</td>
</tr>
<tr>
<td>Common blocks</td>
<td>390 90 120</td>
<td>13</td>
<td>0,53</td>
<td>0,69</td>
</tr>
<tr>
<td></td>
<td>390 140 120</td>
<td>13</td>
<td>0,83</td>
<td>1,08</td>
</tr>
<tr>
<td></td>
<td>390 190 120</td>
<td>13</td>
<td>1,12</td>
<td>1,46</td>
</tr>
</tbody>
</table>

**Interior Quantities for masonry units - interior/dry**

<table>
<thead>
<tr>
<th>Masonry unit type</th>
<th>Masonry unit size (mm)</th>
<th>50 kg bags of All Purpose Cement per 1000 units</th>
<th>Building sand per 1000 units</th>
<th>Cubic metres of building sand per 1000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard brick</td>
<td>222 106 75</td>
<td>2,5</td>
<td>0,4</td>
<td></td>
</tr>
<tr>
<td>Maxi-brick</td>
<td>290 140 90</td>
<td>3,5</td>
<td>0,9</td>
<td></td>
</tr>
<tr>
<td>Common blocks</td>
<td>390 90 120</td>
<td>3,5</td>
<td>0,7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>390 140 120</td>
<td>5,5</td>
<td>1,1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>390 190 120</td>
<td>7,4</td>
<td>1,4</td>
<td></td>
</tr>
</tbody>
</table>

Mortar must not be used after it has started to set, which usually occurs about two hours after it has been mixed. To reduce wastage, it is better to mix a number of small batches as they are required, rather than mixing one large batch.

**Batching the materials**

A builder’s wheelbarrow is a convenient measure for large batches. Its capacity is 65 litres. Steel drums of 20 or 25 litre capacity and buckets are useful for small batches.

To batch, shovel material into the measure and then strike off level with the brim.
Placing the mortar and bricks or blocks

- Bricks or blocks should be laid on a prepared solid concrete slab or foundation. Refer to the AfriSam guide to making concrete for further information on concrete slabs and foundations.
- Start by laying your first course along the concrete slab or foundation.
- Lay one brick at either end, level them and secure the fishing line so that it runs precisely along the back top edge of these two bricks. This will give you a guide for placing the rest of the bricks in this bottom row.
- Load your trowel with mortar and place enough onto the foundation to lay two or three bricks at a time. Drag your trowel along the length of the mortar to make a deep hollow along the middle of the mortar.  
- Prior to placing each brick, ‘butter’ the end of each new brick with mortar and place it firmly up against the previous brick.
- Place your bricks onto the top of the mortar and tap into place until the top edge of each brick lines up exactly with the fishing line.
- Scrape off any mortar that has been squeezed out from between the bricks as you work.
- Once you have laid the first course, begin building up the corners. Stretch the fishing line tightly between the end bricks of each course at the two corners at either end of the wall. For larger scale brickwork, profiles are used for setting up the corners and supporting the fishing line. The back top edge of each brick laid should line up exactly with the fishing line.  
- As you fill in the brickwork between the corners, move the fishing line up one row of bricks (a course) at a time.
- Use the spirit level often to check that the row of bricks is level and that the corners are exactly vertical and not leaning in or out.
- Do not use too thick a layer of mortar between bricks or blocks; this is wasteful and may lead to cracking. Ideally the thickness of the layer should be between 10 and 15 mm. To ensure that the wall is weatherproof, point the joints if the wall is not to be plastered.
- With blockwork, bed only the inner and outer shells in mortar. This reduces water penetration since the water cannot travel along the mortar to the inner wall.
- When building with weak building units, use a weak mortar.

Quantities of materials

See mix proportions for quantities of cement and sand required per 50 kg bag of cement. Quantities required for blocklaying depend on block size and are contained in the product brochures.

Conclusion

Provided sufficient attention is paid to the selection of materials, mix proportions, placing the mortar and bricks or blocks, the results should be strong, durable, look good and last a lifetime. For further assistance in this regard, please contact AfriSam Customer Service.

Every effort has been made to ensure accuracy of data and information presented and no liability is accepted for errors or omissions.

Acknowledgement: “How to make concrete bricks and blocks” published by the Cement & Concrete Institute.

Tools required

Make sure you have all the tools you need to lay bricks before you start. Make sure all your tools are clean and in good working order. You will need:
- A wheelbarrow
- A bucket
- A spade
- A strong grade of fishing line
- A pointed bricklaying trowel
- A straight edge [wood or steel]
- A spirit level [± 900 mm long]
- A set of pointing tools

Acknowledgement: “How to make concrete bricks and blocks” published by the Cement & Concrete Institute.