MANUALLY OPERATED
INTERLOCKING BRICK MAKING MACHINE
CONTENTS

Set Up of Production Line - Page 1
Soil Types - Page 2
Preparation - Page 2
Mixing - Page 2
Set Up Procedure - Page 3
Different Brick Cement Ratios - Page 3
To Produce One Brick - Page 4 to 6
Curing of Bricks - Page 6
Finishing - Page 6
Disclaimer - Page 6
1. **SETUP OF PRODUCTION LINE**

Once you have established where you are going to make your bricks, it is a good idea to set up your production site in such a way as to have a free flowing production line in order to minimize labour, time and cost.

It is a good idea to have your machine and mixing area all under some shade. You also want your water supply at your place of mixing and curing – either by tap or water tank.

You must level out where you are going to put your machine/s so that the machine is sitting level.
2. **SOIL TYPE**

When looking for the right soil type, you should use soil from the subsoil, so as to avoid any organic matter. The best soil type is sandy loam (more sand than clay). Your optimum ration is 70% sand to 30% clay silt content. The reason for this is too much sand causes difficulties in handling, and too much clay causes the brick to shrink and in doing so they crack.

If your soil has too much clay you can add sand to get the right ration.

3. **PREPARATION**

Once you had dug your soil for your brick making, it is a good idea to sieve it, as this will remove large lumps and stones. A sieve with holes between 5mm and 10mm should be used.

4. **MIXING**

Your cement to soil ratio can be anywhere from 5% to 12% cement. Once you have determined what ratio you are going to use, you can then start your mass mixing.

The easiest method for preparing your mixture is to have a container that holds the same amount as a bag of cement. The cement must come level with the top of the container so that measuring one part cement will be the same as one part soil.

Here are some example of different mixing ratios:

- 5% Mix = 1 bag Cement : 20 parts Soil
- 8% Mix = 1 bag Cement : 12 Parts Soil
- 10% Mix = 1 bag Cement : 10 parts Soil
- 12% Mix = 1 bag Cement : 8 parts Soil

When mixing it is advisable to only mix one bag of cement at a time so you get an even mixture. Start by mixing your soil and cement until mixed thoroughly. Then add water – this must be done slowly and evenly, ideally using a watering can.

You need to make sure you add the right amount of water to your mixture. Too dry mixture will make your brick crumble when handled and too wet will make your brick lose shape and crack. Ideally you want a mixture which when you squeeze it in your hand it sticks together and when you push your thumb into it, it will break into a few pieces. When you compress your brick there should be no visual sign of water on the top of the brick or on the lid and sides of the machine.
5. **SET UP PROCEDURE**

Remember the less soil you put in the chamber, the less dense the brick will be, so setting up the machine is important.

When the machine leaves the factory the chamber is set to compress approximately 3”. The amount of compression one can get will vary from soil type to soil type, and it is important that you get it right.

If when compressing your first brick the handle does not go over the centre to the end of its travel, you are trying to compress too much soil and the piston has not got to its fully extended position, and the brick that you will get will be thicker than 4 ¼”. If this happens the adjustment nut will have to be turned anticlockwise to make the chamber smaller, which will reduce the compression chamber slightly so that the brick can be compressed to its proper size – which is 4¼” or 110mm.

If on the other hand the brick that you get is the correct size but soft to the touch then the adjustment nuts should be turned clockwise to make the chamber slightly larger, thus increasing the compression chamber.

Once you have got this adjustment correct you should not have to alter it again unless you are getting your soil from a different location.

6. **DIFFERENT BRICK CEMENT RATIOS**

It is a good idea when building a house to think about different soil and cement ratios. If you are not going to plaster the outside it might be worth considering using a higher cement ratio up to or above a meter or so to avoid damage caused by the elements such as rain splash.
7. **TO PRODUCE ONE BRICK**

1. Open the lid and fill compression chamber unit level. Use a straight edge to scrape off excess soil mixture.

2. Close the lid and pull handle up onto lid arms as in the picture

3. Lift lock for over-centre cam and pull handle
4. Pull handle until it reaches its maximum travel.

5. Lift handle back and out of the lid arms to the position in the picture below.

6. Open the lid and pull handle down, thus pushing the brick out of the compression chamber.
7. Remove the brick by hand and lift handle back up so that the piston is resting on the adjustment nut so as to repeat the process.

PLEASE NOTE
When filling compression chamber pour in mixture and level off with straight edge. DO NOT press down with hand or anything else. It is advisable to have a right size container so as to fill the chamber with the same quantity of soil mixture every time, and in turn get the same compression on each brick.

8. CURING OF BRICKS
Once you have made your bricks you need to cure them for at least 21 days to ensure a good strong brick.
Level out an area close to where you are making your bricks, lay down a sheet of plastic to stack your bricks on. Do not stack more than five bricks high as this will damage the bottom bricks. The width you stack them will depend on the width of your plastic cover. You should also be able to reach the centre bricks from either side with a watering can so as to be able to water them.

Once the bricks are made and stacked they should be covered immediately to stop them drying too quickly. They should then be watered once every day for between seven and 10 days. They should then be left for up to eleven days under plastic. This will ensure a good, cured brick.

9. FINISHING
If you are not plastering the walls or pointing them, then use a soil/cement mixture to fill the joints or any chips that have occurred while building. This will leave your wall looking neat. A sealant may be a good idea to put on the inside and out, as this will also protect your walls better, and will make it easier to paint.

10. DISCLAIMER
Ndume Ltd cannot guarantee the quality or strength of bricks made with this machine. Quality and strength of bricks is entirely dependent on soil type, ratio of mix, water content and curing technique. Ndume therefore accepts no responsibility for brick quality