



# Successful Concrete Compaction

*- An Overview*

**ARMCON**  
CERTAINTY: IN CONCRETE

# Successful concrete compaction:

## Top Tips

- Use the right method for your job
- More vibration is better than less
- Follow the rules for best results
- Proper compaction improves your concrete

## Overview

What is compaction?

Fresh concrete always contains air and the amount varies depending on the consistence class. Slump class S1 can contain up to 20% air and S2 slump class can contain as much as 5% air.

The purpose of compaction is to remove this unwanted air from the fresh concrete.

Why remove the air?

- Every 1% air reduces the strength of the concrete by 5%
- Air voids increase the permeability of the concrete and reduce the durability and protection to reinforcement.
- The bond between the concrete and reinforcement will be poor.
- Blemishes and blowholes will spoil the appearance of the finished surface.

How do we remove excess air?

The best way to remove air is by using some form of vibration. This can be applied directly **into** the concrete using a vibrating poker or **externally** using a vibrating table.

Vibrating pokers

These come in a variety of sizes to allow access into congested reinforcement but the bigger they are the more effective they are. Typically for an Armcon Surefit block a 50-75mm poker will work best giving a radius of effect of 200-350mm depending on the consistence of the concrete.

The poker should be inserted **vertically** at spacings of about 500mm centres and should penetrate about 100mm into the previous layer to ensure a good bond between layers. Leave the poker in the concrete until air bubbles stop appearing at the surface. Each layer should be no more than 500mm thick.

Remove the poker slowly to allow the concrete to flow back into the space left by the poker. Pay particular attention

to the sides of the mould to ensure good surface finish. When you see cement fat at the edge of the mould you know you have done enough vibration.



*Compacting the top layer in an Armcon Surefit block mould*

### Vibrating tables

The vibrating table is an essential tool for the pre-caster aiding the production of high quality concrete products. The force of vibration needed varies depending on the

weight of product being compacted and the Armcon variable speed vibrating table allows the operator to set the correct speed to give the optimum vibration for each product. As an example a fence post weighs about 50kgs and will need more force than a slab weighing 15kgs. If the table is set right for a post mould when you put a slab mould on it after the post the slab will bounce all over the place, by reducing the speed of the vibrator the operator can get perfect vibration on the slab and ensure all the air is removed quickly and effectively. The mould should sit on the table without bouncing as this will give the best results.



*Armcon variable speed vibrating table*

#### External vibration

Sometimes vibrators are bolted to the outside of formwork to aid compaction however this is limited to special jobs and requires very strong formwork. Another form of external vibration is the use of a moveable vibrating beam on pre-stressed concrete moulds to aid compaction; in this case it is essential to ensure the beam is tightly clamped to the mould to provide the full effect.

#### Over-vibration

Problems associated with under-vibration are far more serious than those arising from over-vibration.

It is almost impossible to over-vibrate a well designed and properly proportioned concrete.

#### Re-vibration

Assuming concrete is still workable there is no detriment to re-vibrating it again indeed this may be beneficial in some instances to remove blowholes from complex formwork.

## Safety

Exposure to vibration can cause long term health problems.

- Avoid contact with vibrating equipment or moulds
- Always wear ear protection
- Always ensure moveable vibrating equipment is firmly clamped before operating
- Always wear eye protection
- Never hold moulds to stop them bouncing