



From two components to the finished bone cement: Bone cement is produced by polymerisation

'The bone cement is the only implant that we manufacture ourselves.' Professor Rudolf Ascherl

By mixing PMMA powder and MMA liquid, a chemical process is triggered, the polymerisation. Polymerisation is the crosslinking of the individual molecules, thus forming growing chains.

As soon as the two components of the bone cement come into contact, the polymerisation process starts with no possibility of stopping or interrupting.

The mixture starts as a rather liquid dough which becomes increasingly viscous until the dough finally hardens completely to a solid matrix. The speed of the polymerisation reaction and thus the time until the bone cement is hardened depends on external factors:

- **Temperature** (the cooler the room, the prosthesis or the bone cement components, the slower the setting process)
- **Humidity** (higher humidity accelerates polymerisation)
- **Type of mixing** (vacuum mixing accelerates polymerisation reaction)

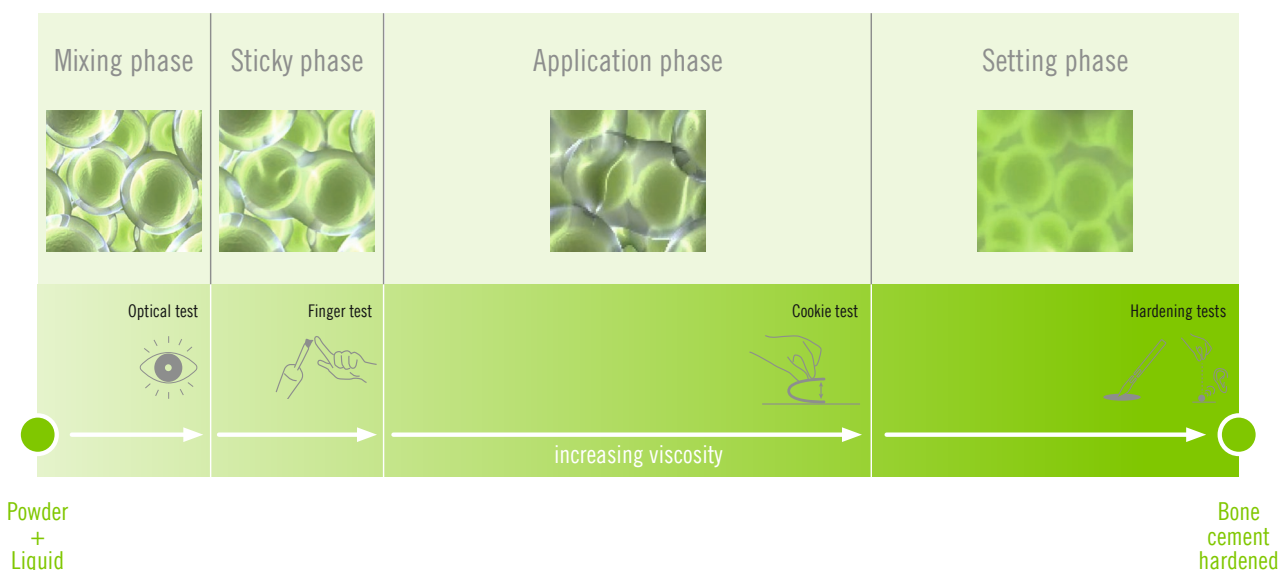
The four phases of polymerisation

The polymerisation of the bone cement occurs in four consecutive phases:

1. Mixing
2. Sticky
3. Application
4. Setting

The whole sequence is characterised by an increase in viscosity of the bone cement dough up to complete setting. Independently from its initial viscosity, every type of bone cement passes through these four phases.

HANDLING PHASES



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