

Vicat Needle Apparatus for Cement Consistency and Setting Time

Operating Manual

Civil Engineering Test Equipment

Intended use

Determining the normal consistency and the initial and final setting times of hydraulic cement and Class A limes by measuring needle penetration into a paste sample.

Intended users

Trained construction materials testing, quality control and teaching laboratory personnel; students under supervision.

Read this manual completely before first use and keep it with the product. This document provides general operating, care and safety guidance. Where the product is supplied with manufacturer labeling or instructions, those take precedence. For questions, a replacement copy, or a digital copy of this manual, email sales@scimedstore.com.

1. Safety

Safety warnings and cautions

- Wear gloves and eye protection when handling cement. Wet cement is alkaline and can cause skin burns and eye injury.
- Avoid breathing cement dust; weigh and mix dry cement in a well-ventilated area or wear a dust mask.
- Wash skin that contacts cement paste promptly with clean water.
- Handle needles with care; the 1 mm needles are sharp and easily bent.
- Handle the glass base plate carefully to avoid breakage and cuts.
- Place the apparatus on a firm, level, vibration-free bench.
- Lower the rod gently; do not let it drop freely onto the needle stop or the glass plate.

2. Package contents

- Metallic frame with movable rod
- Dashpot
- Brass Vicat mould
- Glass base plate
- Consistency plunger
- Initial setting needle
- Final setting needle with annular attachment
- Spanner
- User manual

Check contents on receipt. Report missing or damaged items to sales@scimedstore.com within 48 hours of delivery.

3. Specifications

Frame	Metallic, with freely movable vertical rod
Movable rod weight	300 g
Dashpot	Fitted, for gentle lowering of needles
Vicat mould	Brass, 70 mm top diameter x 80 mm bottom diameter x 40 mm height
Consistency plunger	10 mm diameter, 50 mm length
Initial setting needle	1 mm diameter, 50 mm length
Final setting needle	1 mm needle with annular attachment, 5 mm outer diameter
Scale	0-50 mm graduated scale
Test methods (per listing)	IS 5513, IS 4031 Parts 4 and 5, ASTM C187, ASTM C191, EN 196-3, BS 4550

4. Unpacking and setup

- 1 Unpack and check all parts against the package contents list.
- 2 Place the frame on a firm, level bench free from vibration.

- 3 Check that the movable rod slides freely in its bearing and that the dashpot works smoothly.
- 4 Clean and lightly oil the inside of the mould and the glass base plate so the paste does not stick.
- 5 Fit the required needle or plunger to the rod and tighten it with the spanner.
- 6 Lower the needle onto the glass plate and set the scale indicator to zero (or to the reference point required by your test method).

5. Operation

Normal consistency test

- 1 Fit the 10 mm consistency plunger.
- 2 Prepare cement paste with a trial quantity of water, following the mixing procedure in your test standard.
- 3 Fill the mould resting on the glass plate, smooth the top level with the mould rim and place it under the rod.
- 4 Lower the plunger gently until it touches the paste surface.
- 5 Release the rod quickly so the plunger sinks into the paste.
- 6 Read the penetration on the scale.
- 7 Repeat with fresh paste and adjusted water content until the penetration meets the value given in your test standard. Record that water content as normal consistency.

Initial setting time

- 1 Prepare paste at normal consistency and note the time water was added.
- 2 Fill the mould and place it under the rod with the 1 mm initial setting needle fitted.
- 3 Lower the needle gently to the paste surface and release it.
- 4 Read the penetration and record the time.
- 5 Repeat at the intervals set by your test standard, using a fresh spot each time and cleaning the needle between readings.
- 6 Record the initial setting time when the penetration reaches the value specified in your test standard.

Final setting time

- 1 Replace the needle with the final setting needle with annular attachment.
- 2 Lower the needle gently onto the paste surface at the intervals set by your test standard.
- 3 Record the final setting time when the needle marks the surface but the annular attachment does not, as defined in your test standard.
- 4 Keep the test specimen in the temperature and humidity conditions required by your standard throughout the test.

6. Cleaning and disinfection

- Remove paste from the mould, glass plate and needles immediately after testing, before it hardens.
- Wash parts with water and a soft brush. Do not use abrasive tools on needles or the glass plate.

- Dry all parts thoroughly and apply a light film of oil to steel parts to prevent rust.

7. Maintenance and storage

- Store the apparatus in a clean, dry place with needles removed and stored in their holder.
- Check needles regularly for bending, wear or damage and replace them if they are not straight.
- Check the rod weight, needle dimensions and mould dimensions periodically against your test standard.
- Keep the rod and dashpot clean and free moving.

8. Troubleshooting

Problem	Likely cause	What to do
Rod does not slide freely	Dirt or hardened paste on the rod or bearing	Clean the rod and bearing; do not force it.
Readings inconsistent	Bench vibration, uneven paste surface or needle reused at same spot	Use a stable bench, level the paste and test at a fresh spot each time.
Needle bent	Rod dropped onto a hard surface or set paste	Replace the needle; lower the rod gently.
Paste sticks to mould	Mould not oiled	Clean and lightly oil the mould before filling.
Zero reading drifts	Needle loose in the rod	Tighten the needle with the spanner and reset zero.

9. Disposal

- Allow cement waste to harden and dispose of it as construction waste in accordance with local regulations. Do not wash large amounts of paste into drains.
- Dispose of metal and glass parts in accordance with local regulations.

10. Warranty and support

Products are covered by SciMed's standard warranty (12 months from purchase unless a different period is stated on your invoice). Warranty terms: scimedstore.com/pages/warranty.

Support, spare parts and additional copies of this manual: sales@scimedstore.com. Please include your order number and a photo of the product or issue.

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