

Video Extensometer AVE2 Testing Considerations

Marking the Gauge onto the Specimen

The most common method of marking uses white or black ink dots. The use of marking jigs for various gauge lengths is recommended to ensure successful marking of dot shape and size. If working to a particular standard, ensure you apply marks with the specified gauge length and gauge width.

When deciding how to mark your specimens, you must consider:

- *The mark material* – ink and tape dots both contain solvents that may affect the strength of the specimen.
- *The mark colour* – the colour of the mark must contrast with the colour of the specimen as seen by the camera, which uses polarised light.
 - In most cases, white marks produce the best results, even on specimens that appear white to the human eye.
 - White marks produce the best results on reflective metal specimens and dark colour plastic specimens.
 - If white causes problems, the best alternative is black, provided it contrasts sufficiently with the specimen background colour, as seen by the camera, which uses polarised light.
 - For most applications, you should not use silver marks as these appear black to the camera, although they may be effective on white specimens if white marks cause problems.
- *The shape and size of marks* – must be compatible with the profile of the specimen.
- *Marks that won't deteriorate* – marks must stay in place and be visible to the camera throughout the test. Marks that fade, flake off, will cause the measurement by the video extensometer to stop mid test.

Marking Tips

Test your specimens as soon as possible after applying the marks to minimise the possible effects of solvent from inks or adhesive on the specimen properties.

If your specimen breaks at the point where the mark is applied, consider an alternative marking method.

If your specimen undergoes long extension during testing, make sure that the marks are still visible at the end of the test.

Dots must be used if you are measuring both axial and transverse strain. Lines can be used for axial measurement only.

Applying Ink Dots

The minimum recommended diameter for ink dots is 2mm. The maximum recommended diameter is 4mm.
The marking jigs provided will produce 3mm dots.

1. Ensure the marking jig is clean and free of residues of the previous used ink colour – this could cause cross-contamination and reduce contrast between the dot and the specimen.
2. Locate the holes in the jig that match your chosen gauge length.
3. Select the appropriate ink colour.
4. Make sure the specimen is clean and free from grease.
5. Lay the specimen on a flat surface and position the jig over it so the chosen holes are located an equal distance from the center line of the specimen. The jig is shaped into sections of different widths to aid positioning on the center line on specimens of different widths. Make sure the jig is positioned so that the printed text on the jig is readable and the countersink on the holes is towards the specimen surface.

6. To apply round, even density dots; keep the pen upright, apply minimum pressure to the pen, apply to the edges before the center, do not disturb the jig, use enough ink so the dot is dense but ink doesn't run.
7. Remove the jig without smudging the marks.
8. Inspect dry ink dots to ensure they are round, opaque with even density and no wicking or bleeding.

Troubleshooting ink dots

Irregular dots

- Too much or too little ink
- Grease or dirt on the specimen surface marked

Smudged dots

- Too much ink
- Careless removal of the jig after marking
- Touching the mark before the ink is dry

Bleeding or Wicking of the ink dots

- Bleeding – specimen surface is abrasive
- Wicking – test specimen is woven
- Use tape dots if bleeding or wicking is a consistent problem

Loss of Detection of ink dots

Cause	Fix
Loss of contrast due to specimen changing colour during test	Different ink colour
Fading of the dot from excessive extension	Use tape dots
Flaking of ink from the specimen	Check ink compatibility with material Test when ink dots are wet
Dot moves outside of field of view of the lens	Check camera position – can it be moved to capture the field required Use lens with larger field of view

Using the Video Extensometer AVE2 with Digital Image Correlation

To use this function image capture must be enabled in the software. When using the digital image correlation software there are two different extensometer modes available – *Mark finding* or *Speckle Only*.

Mark Finding

In this mode the sample must have a speckle coating in addition to gauge marks. An area around the dots must be free of the speckle pattern so that the software can identify the marks. The test will then run as normal and DIC images are saved.

Speckle Only

In this mode the sample must be prepared with a speckle pattern and *video extensometer AVE2 cannot be used as a strain device*, it operates purely as a camera to capture images for DIC. Ensure that you do not create a measurement based on the AVE2, that the AVE2 is not set as a strain source in the test method, and that auto-balance is not enabled on the AVE2.