How to measure wet film thickness using Elcometer Wet Film Wheels

There are two main methods of measuring wet film thickness in the field - wet film combs and wet film wheels.

Whilst wet film combs have teeth which are used to determine the coating thickness; a wet film wheel has two circular, smooth outer wheels, which rest on the substrate - and a central eccentric wheel which is accurately ground from zero (the same level as the outer wheels), to the maximum thickness range in half a rotation (180 degrees).

Before taking a measurement, check for any damage to the inner and outer wheels, by running your finger over them to feel for bumps or dents. If you feel any, replace the wheel.

If there is any dry paint on the wheel from previous tests, this should be carefully removed using a thinner. Do not use sandpaper or scrape the wheel with a knife as this will damage the wheel and affect its accuracy.

Hold the wheel by its central spindle, using either a finger and thumb or a wet film wheel handle.

When placing the wheel into a wet film, it should be placed down evenly, with the maximum scale reading positioned closest to the substrate.

Gently roll the wheel along the coated substrate, either through half a rotation (180 degrees), or one complete rotation (360 degrees), depending on the standard being used, and remove from the surface.

When the central wheel reaches the thickness of the coating, it touches the paint and is “coated”. To determine the wet film thickness, locate the first point of contact of the paint on the central wheel, which is closest to the wheel’s maximum value, and read the thickness from the scale on the outside of the wheel.

When placing the wheel into a wet film, it should never be placed down with the zero closest to the substrate; as the coating film tension will pull the paint up the wheel, resulting in an inaccurate reading.

Once the wet film thickness has been recorded it can be used to predict the dry film thickness once the coating has cured.

To calculate the dry film thickness you need to know the ‘solids to liquids’ ratio, also known as the volume solids content, which can be found on the coating’s data sheet.

If this ratio is 50:50, or 50%, then a wet film thickness of 100 microns will mean that the dry film thickness is 50 microns, once the liquids have evaporated.

Clean the wheel, making sure that any solvent-based coatings or cleaners are disposed of responsibly, and repeat the test as required.

The Elcometer 3230 Wet Film Wheels are available in a wide range of scales - from the 0-25microns (0-1mils) thin coatings wheel; to the thick coatings wheel which measures wet film thicknesses up to 1mm (40mils).

In addition to the standard wheels, Elcometer also offers a number of wet film wheels specifically designed for in line wet film measurements.

The Elcometer 3230 Coil Coating Wet Film Wheels have knurled outer wheels, which minimise skipping - thereby allowing measurements to be taken on fast moving substrates.

So remember:

- Clean the wheel with thinner and check for bumps or dents before testing;
- Place the wheel down evenly at the maximum scale value;
- Roll through 180 or 360 degrees depending on your standard;
- And read the thickness from the scale on the outside of the wheel.

For more information about Elcometer standard or coil coating wet film wheels, click on one of the links on-screen, or visit elcometer.com; and please don't forget to subscribe to the Elcometer Channel to be notified of any new videos.