

How to create a sample film using the Elcometer 4340 Automatic Film Applicator

When it comes to developing products such as paints, varnishes, cosmetics, or glues for example; it's typical to test their properties part of their development. It's important therefore to ensure that consistent, repeatable and reproducible films can be made in order to undertake fair and accurate tests. This is where the Elcometer 4340 Motorised / Automatic Film Applicator comes in.

In this video we're going to show you how to create a film using a film applicator with the Elcometer 4340. While there are a wide range of film applicators available, of varying designs, they all work in pretty much the same the way. Alternatively, if you want to find out how to create a film using a spiral bar coater with the Elcometer 4340, make sure you check out our separate "how to" video on that.

And before we get started, for a full introduction to film application and the Elcometer 4340, make sure you check out our introduction to Film Application video, and our Applicators Explained video, detailing the full Elcometer Film Applicator range.

To begin, place the supplied bubble level on the table, and adjust the feet of the unit, until the table is level. Next, switch the Elcometer 4340 on using the switch at the back of the machine, followed by the green button on the control panel.

Now you can set your carriage speed – in other words, how quickly the film is applied. Simply set the dial from 1 to 11, to choose your desired speed. This should only be done when the carriage is stationary, not while the carriage is moving.

With the speed set, you now set the carriage start and stop positions, which defines the length of your film. This is set using two knobs on the back of the machine. To adjust the start position, press the carriage start button, and the carriage will move to the end position. With the carriage now out of the way, you can unscrew the starting position knob, adjust its position, and then retighten.

To adjust the stop position, press the carriage return button which returns the carriage to the start, and then adjust the end position knob as before.

With the applicator's speed and distance set, now you can mount the substrate to the table. Regardless of what kind of table you are using make sure the table and underside of the substrate are both clean.

On a standard table, mount the substrate securely using the spring clamp. This clamp can be attached at two locations on the table; one for A3 size substrates, and the other for A4 size substrates.

On our vacuum tables, which are powered by a separate vacuum pump in order to reduce vibrations in the unit that could affect the quality of your film, it's slightly different.

When using a perforated vacuum table position your substrate as shown, attach the vacuum pump using the hose to the connection on the left side of the machine, select the substrate size on the vacuum control (select ON for A3 substrates, and OFF for A4 substrates), then switch on the vacuum pump. The substrate will then be drawn onto the table and held firmly. Any areas of the vacuum table not covered by the specimen should be covered using Scotch tape or a similar removable thin tape, to prevent any of your product getting into the vacuum table, and to ensure the maximum amount suction provided by the vacuum table is applied to your substrate. If you don't have any suitable tape available, don't worry, as strips of paper can also be used to cover the holes.

When using a double channel vacuum table, designed for thin substrates, the table is connected and started in the same way, but it only works with A3 size substrates that completely cover the channels that run around the outside of the table. As the double channel table creates a vacuum from the edges rather than through perforations, this keeps the thin material flat and secure without creating irregularities.

With your substrate mounted, now it's time to add your chosen applicator to the carriage. There are three types of carriage: a film applicator carriage, a spiral bar coater carriage, and a combined film applicator and spiral bar coater carriage. As the Elcometer 4340 comes with a combined carriage as standard, we will be looking at testing with one of those in this video, but full instructions for each carriage type are available in the Elcometer 4340 instruction manual on the Elcometer website.

To use the majority of film applicators, rotate the carriage to the raised position, fit the applicator pushing bar into position using the knurled screws, place the applicator on the substrate until it's touching the pushing bar ensuring the pushing bar is the correct height (this can be adjusted using the screws), and when using a lightweight applicator such as the Baker, place the supplied weight onto the two locating pegs, ensuring the applicator remains firmly in contact with the substrate.

With your applicator in-place, pour your test sample in front of your chosen tool, ensuring it is evenly spread across the width of the applicator. Try to avoid getting your product in front of the feet of the applicator, if the one you've chosen has them, as this can cause the applicator to become uneven and affect the consistency of your film. Then with the machine on, press the carriage start button, and your film is created, with the carriage stopping automatically at the stop position.

Upon completion of the film, remove your applicator immediately, to avoid any excess product dripping on the substrate. One way of making this process easier is to place a thin sheet of paper under the end of your substrate and ensure the stop position of your carriage goes beyond the length of your substrate. This way all of the excess coating is pushed onto a sacrificial piece of paper, which you simply remove once the film has been created, avoiding any spillage onto the substrate or test bed underneath.

You should also clean your chosen applicator as soon as the film has been created, to avoid your product drying onto the applicator, which could affect its performance.

Then press the carriage return button, and you have your completed film. Simply repeat this process as many times as required, with the Elcometer 4340 ensuring you get the same film every time, allowing for consistent, comparable testing.

For more information on the Elcometer 4340 Automatic Film Applicator, or Elcometer's full range of applicators, simply visit Elcometer.com or click on one of the links on-screen.

And please, don't forget to subscribe to the Elcometer channels to be notified of any new videos.