

Film Application – Manual vs. Automatic Film Applicators

When it comes to the development of products; such as paints, varnishes, cosmetics, or glues for example; manufacturers will typically test various properties of their product to ensure they know exactly how it will perform when used by customers. Some of the properties manufacturers will test for could include gloss, hiding power (in other words how well the product covers over something), resistance to sagging from gravity, or visually comparing the differences between two different formulations of the same product; among other things.

This is why manufacturers need be able to create repeatable and reproducible sample films of a defined thickness - in order to perform meaningful, comparable tests on their products.

These sample films are typically created using a film applicator.

While there are many different designs of applicator, they all work in essentially the same way. The applicator is placed on a flat substrate – this is often done on a test chart, but it could be applied to a wide range of materials such as metal, glass, or polythene to name a few – then the product you wish to make a sample film of is added either into either the applicator’s reservoir (if it has one) or in front of the applicator. The applicator is then moved across the substrate at a steady speed, guiding the product through a precision engineered gap, which creates a film of a defined thickness.

Now this all looks and sounds very simple, but in order to undertake fair and accurate tests on these films, they all have to be the same, and when creating these films manually, human error can create inconsistencies between films. Differences in how smoothly you complete the drawdown, how quickly you move the applicator, or how much downward force you place on the applicator while moving it, can all affect the resulting film. And these are differences that could come from just one person creating the films, let alone different people.

So, in order to remove that human error, and ensure repeatable and reproducible films are made, every time; a motorised, automatic film applicator can be used.

But it’s not enough to just have a motorised film applicator. The motor has to be smooth, and housed within a heavy base unit, with a sturdy, rigid design, that minimises vibrations. If not, your films can end up with “vibration ridges” in them, which are unwanted variations in the film thickness. This variation could only be as little as a micron, but when you’re producing a film that’s only 5 microns thick, that’s 20% of your target thickness.

This is where the Elcometer 4340 Motorised Automatic Film Applicator comes in.

With a precision engineered aluminium table that’s 5 times flatter than glass, and mounted on a heavy base unit designed to minimise vibrations and produce high quality samples without “vibration ridges”; the Elcometer 4340 Automatic Film Applicator provides total consistency and reproducibility when applying films on various substrates - including contrast charts, steel sheet, glass, and more.

The sturdy, rigid design, which can provide up to 15 years of standard use, not only eliminates the variation in samples usually caused by human error, but also eliminates the variation that comes from smaller, more lightweight motorised film applicators, that are susceptible to “vibration ridges”.

The Elcometer 4340’s larger size not only helps with the quality of your samples, but the quantity too, as the large testing table makes it possible to test 2 charts simultaneously. Not only that, there’s a choice of tables available. In addition to the standard flat table, where you simply clip the substrate to the testing table, there’s a choice of two vacuum tables. The perforated vacuum table is

ideal for a wide range of test pieces including glass, plastic sheets and contrast charts, including thicker more substantial test pieces; while the double channel vacuum table, is designed for thinner test pieces such as polythene for example, as the table creates a vacuum from the edges rather than through perforations, keeping the thin material flat and secure without creating irregularities. Not only are all of Elcometer's vacuum tables engineered to be flat and precise with little variation, but they are powered by a separate vacuum pump. By keeping the vacuum separate from the main unit, this again helps keep vibrations down to a minimum.

The Elcometer 4340 can also be fitted with an electrically heated table, so you can simulate the application of your film in hotter climates, from ambient room temperature up to 200°C.

With 11 pre-set transverse speeds, from 5 to 100mm per second, and the ability to set your transverse length, the Elcometer 4340 makes it easy for you to repeatedly create precisely the films you need in order to test your product.

As for what samples you can create, the Elcometer 4340 works with a full range of Elcometer Film Applicators and Spiral Bar Coaters, and it's even possible to use up to three film applicators at the same time.

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.

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