

## NEFF kitchens stand the test of time

*Markus Biess, Elcometer Germany, tells us how Elcometer helped NEFF to maintain their quality standards.*

Established by Carl Andreas Neff in 1877, NEFF are regarded as a leading company in the European kitchen appliances market. NEFF, who are based in Germany, provide a variety of products including oven hoods, dishwashers and hobs as well as refrigeration and laundry appliances. They endeavour to supply the highest quality products.



Over the years, NEFF have been responsible for a significant number of breakthrough products and concepts for kitchen devices including CircoTherm®, a hot-air system, which was introduced more than 30 years ago and revolutionised the oven cooking of food.

At NEFF, quality is never compromised, therefore it is extremely important that their high quality standards are maintained throughout the life of their products. This applies to the appearance of the product surfaces as well as their operation. To enhance their rigorous quality control testing, NEFF contacted Elcometer Germany requiring a product that could produce repeatable and accurate results in quality testing. They subsequently purchased an Elcometer 1720 Abrasion, Scrubbing and Washability Tester, which fitted their quality test requirements perfectly.

Specifically designed to test the washability, brushability and abrasion resistance of a wide range of materials, the Elcometer 1720 will allow NEFF to test materials under defined and controlled conditions.

The versatility of the Elcometer 1720 allows up to four samples to be tested at the same time. Each test lane is isolated to enable wet and dry testing to be carried out simultaneously. The ability to use liquids is ideal for monitoring the effects of cleaning fluids for example, as well as the overall durability of the products.



Able to test paints, lacquers, inks, plastics, printed materials and much more, the Elcometer 1720 can be used in conjunction with various international standards.

By simulating wear and tear, NEFF can further develop robust materials that can withstand the punishments of everyday life, enabling NEFF kitchens to stand the test of time. For more information on NEFF products visit [www.neff.de](http://www.neff.de)

## Concrete in Tasmania

*Paul Jenkins, Phillro Industries Australia, reports on the success at the Australasian Corrosion Association annual conference.*

The Australasian Corrosion Association held its annual conference in Hobart, Tasmania over three days in November. During the Conference themed 'Steel in Concrete, Nothing Lasts Forever', Australian Principal Distributor, Phillro Industries showcased the Elcometer Concrete Inspection products at a Trade Exhibition.

The new Elcometer 331<sup>2</sup> Covermeter and Half-Cell Gauge attracted a lot of attention with its powerful data logging and reporting abilities demonstrated to many of the 283 delegates who attended.

Phillro's Business Development Manager, Paul Jenkins reported that the annual conference was extremely well



organized by the ACA and many enquiries were made regarding the new products.

Over the three days an average of 30 guest speakers and 9 eminent speakers covered topics including Concrete, Protective Coatings, various forms of corrosion, Corrosion Control, Asset Management and Corrosion Testing.

Next year, the Conference and Trade Exhibition will be held at Sydney Exhibition Center at Darling Harbour.

## product of the month

### The Elcometer 6014 Shade and Opacity Meter

The Elcometer 6014 is a new low cost, 2-in-1 gauge which can measure shades of paints, inks and coatings as well as the opacity of coatings, plastic films and paper samples.

Features include large angled display for easy reading, move and read – ideal for large areas, statistical analysis of readings as they are taken, long battery life allowing up to 3,000 readings between charges and up to 200 readings can be stored in the gauge for download to PC.



For further information on the Elcometer 6014, or any of our other products, please visit our website [www.elcometer.com](http://www.elcometer.com) or contact your local Elcometer distributor.

### Measure opacity and shade with a single gauge

Shade and opacity meters are used to assess either the shade of a surface or to calculate the opacity of a coating, plastic film or paper sample. They provide a simple indication of colour based on the lightness or darkness using greyscale and not the gloss of a surface.



Traditionally two gauges would be required to measure shade and opacity but the new Elcometer 6014 Shade and Opacity Meter is able to measure both in a single gauge.

#### HOW IT WORKS

The Elcometer 6014 contains a light source, a light detector and a system of lenses. A converging beam of light illuminates the surface from directly above the sample (0 degrees). A light detector is set at 45 degrees to the incident light and this measures the light reflected at this angle.



The shade and opacity readings are calculated by the gauge and displayed as a percentage.

In Shade Mode: The measured value can be used to grade surfaces from black (0% reflectance) to brilliant white (100% reflectance).

In Opacity Mode: The sample must be drawn down on or measured over a substrate with black or white portions. The instrument uses these measurements to automatically calculate the hiding power or opacity of the sample from 0% (transparent) to 100% (totally opaque).

The Elcometer 6014 can also store up to 200 readings in its memory. The gauge also performs statistical analysis of these readings to give an instant indication of batch quality. The move-and-read feature enables large surfaces to be checked quickly and accurately.

Each gauge is supplied complete with Novo-Soft™ Software. The software allows readings data to be transferred from the gauge to the PC and to adjust some of the features of the gauge. The gauge can also be used in conjunction with Opacity Test Charts.

#### WHERE SHADE & OPACITY METERS ARE USED

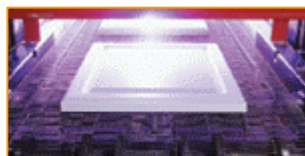
- Testing shades of paints, inks, coatings etc
- Fading of textiles and plastics
- Chalking of paint
- Efficiency of detergents and bleaching agents
- Whiteness of recycled paper
- Cleanliness & oxidation on metal surfaces

The low-cost, accurate Elcometer 6014 makes measuring shade and opacity easier than ever before. For further information on the new Elcometer 6014 Shade and Opacity Meter, visit [www.elcometer.com](http://www.elcometer.com) or contact your local Elcometer distributor.

### Radiation curing

Radiation cured coatings, are replacing many conventional types of curing processes in many commercial operations. Radiation curing (or Radcure) uses electron beam (EB), ultraviolet (UV) light or visible light to polymerize a reactive and usually solvent free coating.

Radcured coatings are often superior to other coating systems and can cure in seconds, but until now were not seen as economically viable for many applications due to the high investment and materials cost. The main applications for this type of curing include graphic arts



UV curing of wooden doors

and inks, plastic coatings, metal coatings, optical coatings and are widely used on coatings on wood.

Increased adhesion is the main aim for using UV lacquers on wood used for furniture and flooring. The main difference between coatings on wood and those on metal or plastic is that wood is porous. When applied, the coating is partially absorbed into the wood. This means that the coating will only be cured if there is sufficient UV energy. Any uncured coating can cause loss of adhesion and sweating of the cured coating.

To ensure the wood is receiving the correct amount of UV energy is important. Too little UV light leads to poor adhesion whereas too much UV light is a waste of resources.

The Elcometer 107 Cross Hatch Cutter provides an instant assessment of the quality of the bond of the coating to the wood. Due to its rugged construction, this gauge is ideal for thin, thick or tough coatings on both flat and curved surfaces.

The Elcometer 107 provides a simple test and cuts the coating into small squares. For the coating to pass the test, none of the squares should fall off, even when pulled with adhesive tape.

This low cost gauge has easy to change cutters each with four faces, ideal for testing a wide variety of coatings with a single gauge.

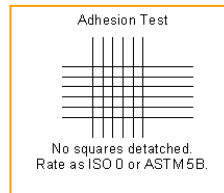


There are two kits available, the basic kit and the full kit.

Basic kit includes: robust handle, cutter of your choice, allen key, storage case, instructions and Classification of Adhesion Test Results chart.

Full kit includes: everything supplied with basic kit, an eye glass, brush, ASTM or ISO adhesive tape in a carrying case.

For more information on Elcometer adhesion testers or any of our products, visit [www.elcometer.com](http://www.elcometer.com) or contact your local Elcometer Distributor.



## Cement goes green

With pressures to become more aware of ecological issues and to be more environmentally friendly, cement manufacturers have taken up the challenge with their cement manufacturing processes.

Traditional Portland cement is produced using limestone (78%), clay (16%) and silica sand (2%). Ecocement is produced using a much smaller proportion of limestone (52%), municipal incineration ash (39%) and sewage sludge (9%). By replacing clay and silica sand with various wastes and reducing the amount of limestone used the carbon dioxide emissions overall (including the waste incineration) are greatly reduced.

Ecocement is available in two forms, ordinary and rapid hardening. The ordinary cement has virtually the same performance as Portland cement and can be applied to reinforced concrete structures as well as being used as a soil stabiliser or sewage sludge solidifier.

Rapid hardening Ecocement is used in the non-reinforcing concrete market. Incineration ash contains minerals that are essential for producing the cement, however the high chloride content makes it unsuitable for use in reinforced structures.



Environmental contributions do not end at using waste. To prevent cement clinker from heavy metal contamination, heavy metals contained in the incineration ash are separated from the flue gas in the form of metal chloride. These metal chlorides are then concentrated and purified so they can be reprocessed as useful metals in refineries. In this way, the Ecocement process saves metal resources, protecting the environment even further.

Features of Ecocement:

- Can be used as a direct replacement for Portland Cement.
- Makes contaminants in incineration ash harmless.
- Uses a zero-emissions production process.
- Protects the environment by recovering heavy metals and purifying flue gases.
- Prolongs the life of landfill sites and contributes to towards recycling.
- Reduces carbon dioxide emissions compared to Portland cement.

The trend towards using Ecocement in countries that incinerate their household waste is now growing more than ever and makes perfect sense for both the economy and the environment.

If you know of any projects using Ecocement, e-mail [editor@elcometer.com](mailto:editor@elcometer.com) with the details and some pictures and we will publish them in the next edition. We look forward to hearing from you!

## Calibration certificates

A measuring instrument with a fixed calibration can be checked and certified as making measurements that are traceable to a national standard. But what can be done with a device with a variable calibration, who's setting is not fixed, such as a coating thickness gauge?

The short answer is: nothing. By definition, a fixed calibration is not the same as one that is not fixed. But that does not mean variable calibration devices are worse gauges, they usually read perfectly with one setting and read something else perfectly with another. You cannot write all this down on a certificate for them, there is no room for hundreds of different settings and the results. So how do we prove the gauge is still correct?

### TRACEABILITY

Let us go back to first principles, the reason for the calibration certificate is to satisfy the ISO 9000 Quality System, which requires measurements to be traceable to a national standard. A coating thickness gauge or ultrasonic thickness meter is normally prepared for measurement by setting it to foils or blocks of known thickness. We can make the gauge show the value on the label but is it still a true reference for measurement? Only by comparing it to a certified standard can we be sure.

The concept is that of 'daily' calibration foils to reset the gauge depending on the application and then a 'master' set, which is used from time to time to confirm continuing traceability. With only one set of foils, we would not be able to prove that they had not worn thin or become uneven. We need the second set, which must be kept in good condition.



So variable calibration gauges must have a master reference somewhere. It is either kept in a factory's standards room, in an outside testhouse or in the gauge manufacturer's service facility. Without using this certified master, there may be no compliance with ISO 9000 - by definition. This master set has the calibration certificate, not the variable gauge.

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## Catalogue correction

The surface area of the Elcometer 5100/3 Payne Permeability Cup (part number K0005100M203) is 30cm<sup>2</sup>, not 50cm<sup>2</sup> as stated in the current catalogue. The volume of the cup at 75cm<sup>3</sup> is still correct.





### Pinhole & porosity detectors and testers

One purpose of a coating on metal is to keep what is outside from reaching the metal. Even a small hole linking the two is unwanted and unwelcome so it must be found and repaired. The problem is both its small size and hopefully its rarity, so looking for it by eye is not practical. Electricity helps us locate it very quickly.

#### TECHNIQUE

The simplest technique for finding small holes, often called pinholes, is using a wet sponge and some electricity. If water can reach the substrate, this is bad, but we use this method for testing. When the hole in the coating is filled with water, it completes an electric circuit connected to an alarm. Early systems were simply a high voltage radio battery and a doorbell but this was gradually improved and the test standardised. Of course, the coating must be non-conducting (non-metallic) and on a metal or concrete substrate.

For thicker coatings, multi-layer, with small holes or cracks, the wet sponge technique is not effective. Instead, a high voltage is used to produce a spark in the air inside the hole.

#### TYPES OF GAUGES

##### Elcometer 270

The handle contains a power unit that generates the test voltage according to the Standard: 9, 67.5 or 90 volts DC. A connection is made to the substrate metal and the sponge moistened with water. Moving the sponge in a line over the surface and then back again allows any air bubble in the hole to be displaced. A little soap or surfactant in the sponge water often helps wet the surface better. The alarm sounds when the water connects the sponge and the substrate. Then the hole is located exactly using the corner of the sponge.

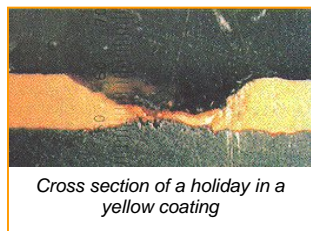


*Elcometer 270 Pinhole Detector*

On larger surfaces, a Roller Probe (part no. T27016960) is more convenient and a longer handle (part no. T27016998) can be connected to reach further.

The Elcometer 270 is often used on single layer coatings up to about 300 microns thick.

##### Elcometer 236



*Cross section of a holiday in a yellow coating*

A battery-powered high voltage generator is the basis of the Elcometer 236 system. The output can be adjusted up to 30 kilovolts DC, which can cause a spark up to jump up to 10mm, depending on the humidity of the air.

That is why this unit is sometimes referred to as a 'spark tester' or 'holiday detector' (it finds a discontinuity or flaw).

Normally, the coating is a good insulator and prevents the spark. But where there is a hole, a crack, a thin area, an inclusion or burst air bubble, the insulation is much reduced and a spark jumps through. Of course, the voltage must not be set so high, it burns through a good coating and not so low, it will not cause a spark from the top of the coating to the substrate. For this reason, very thin coatings



*Elcometer 236 Holiday Detector*

are not tested; they are often not strong enough to withstand the stress. Standard tables relate probe voltage and coating thickness for this porosity test.

Various probes are available to speed up the testing by touching a large area. Straight, right angle probes from 250-1000mm wide can be connected to a telescopic probe handle for large flat surfaces. There are probes for the inside and outside of pipes too, depending on their diameter. And for the non-standard diameters, there is a kit (part number T23615579) for making an electrode of any size to test the external coating of a pipe.

The Elcometer 236 is used to find flaws in single or multilayer coatings about 250 microns to 8mm thick.

#### CONNECTIONS

Both techniques form an electrical circuit and so require a connection to the substrate, for example, at an edge or corner of a panel. You may need to remove some coating to do this. In the case of concrete, connect to a rebar or a fixture. A pipeline must have at least one connection to a metal rod driven 60-90cm into the ground. The detector is connected to this too, using the return (earth) lead. An alternative is to connect to some 10m of bare wire lying on the ground (but not on dry sand).

#### CONCLUSION

A hole (only) in a coating is found by applying water from a sponge. A hole or weak spot is found by applying a high voltage, which sparks through there, but does not damage the good coating. Both are Standard Test Methods.

*In the next issue of elconews e-zine we will be looking at measuring thickness of materials using ultrasound.*

If you would like to make a contribution to the **elconews** e-zine or is there is a subject you would like to see covered, e-mail us at: [editor@elcometer.com](mailto:editor@elcometer.com)