

When old meets new

Sabine Lemke, Elcometer GmbH, reports on the use of modern technology on classic cars.

Herr Wanner and his wife have been big fans of the Oldtimer classic car for many years and have been collecting them for some time. As a result of their passion, in April 2006, they founded a museum dedicated to Oldtimers.

The Wanner Classic Center Teck, based in Dettingen Teck in Germany, is a 3000m² museum exclusively dedicated to exhibiting Oldtimers. The museum, with its granite floors and antique furniture, provides a luxurious surrounding for these special cars. Owners of Oldtimers are able to exhibit their cars at the museum for a monthly fee.

Herr Wanner also offers a restoration service and is always buying and selling these classic cars in order to keep the exhibition new & interesting.



He wanted a quick and easy way to check that the bodywork of the cars he was purchasing were in good condition. Contacting Elcometer for a solution, he purchased the Elcometer 311 FNF Refinishing Gauge. These gauges have been specifically designed for the automotive industry and are pre-calibrated for use on both steel and aluminium substrates. Measuring from 0-500µm (0-20mils), this lightweight, easy-to-use gauge is ideal for quick quality checks, meeting Herr Wanner's requirements perfectly. For more information on the Oldtimers museum, visit www.classic-centre-teck.de

Elcometer E-Award



Prasan Bachhawat receiving his E-Award from Mr Sellars

In the July / August edition of **elconews** e-zine, the winners of the Elcometer E-Awards were announced.

Elcometer's distributor in India, Prasan Bachhawat from Komal Scientific Co was presented with his award by Elcometer's Managing Director Mr Sellars at Elcometer's head office in Manchester, UK.

Prasan won the award for the Largest Annual Sales Growth (percentage).

The export team from the UK were there to join in the celebrations.



Prasan pictured with the export sales team

Chile donation

Marcelo Cancino of APV Ltda, Chile, tells us how Elcometer equipment has aided the testing industry in Chile.

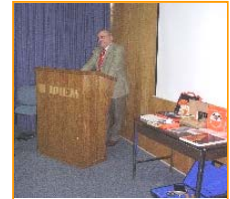
Elcometer Instruments, through APV Ltda – their distributor in Chile, have donated instruments and technical literature to IDIEM.

IDIEM is the Research and Material Testing Institute of the Mathematical and Physical Sciences Faculty of the University of Chile in Santiago. This non-profit organisation provides the most important and prestigious technical reference centre for the coatings industry in Chile.

The equipment included the Elcometer 456 Coating Thickness Gauge, Elcometer 270 Pinhole & Porosity Detector, Elcometer Dewpoint Meter and a selection of gauges to test surface profile, calibration and adhesion. Publications were also provided, including both Spanish and English versions of the Protective Coatings Inspection Manual.

Bladimir Santacruz, Inspection Manager IDIEM said "The donation will allow an improvement of services with these state-of-the-art instruments. This donation is of great significance to us, and the University can be confident that they are using the best equipment available."

Oscar Henriquez, Technical and Marketing Director for APV said "It is a great pleasure to contribute through Elcometer to this prestigious organization and position the brand Elcometer, as the technical reference in Chile".



Oscar Henriquez, Technical & Marketing Director, APV Ltda, addresses the audience



Mr Bladimir Santacruz, Inspection Manager IDIEM, talks with Claudia Rivera, Elcometer Specialist for APV

product of the month

Elcometer 138 Bresle Kit & Patches

The Elcometer 138 Bresle Kit provides an accurate test for the level of contaminants on a surface prior to application. This ensures that the coating meets the specification and does not fail prematurely resulting in costly re-coating and high maintenance costs. Each kit is supplied in a carry case with everything required to complete the testing in accordance with the standards



ISO 8502-6 or ISO 8502-9. Refills for the case can also be purchased separately.

For further information on the Elcometer 138 Bresle Kit or any of our other products, please visit our website www.elcometer.com or contact BAMR at sales@bamr.co.za.

Steel thickness

Steel structures are coated to protect them from corrosion. If this protection fails, the metal turns to rust which has no strength.

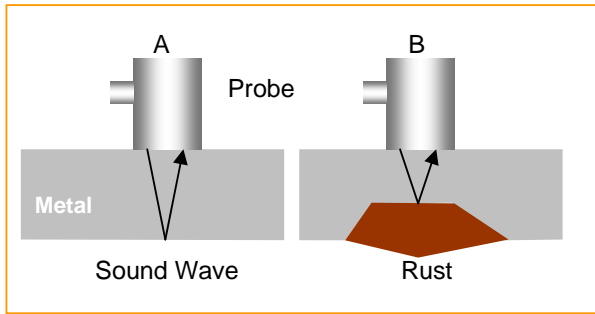
Before the structure is recoated, it is important to check there is enough metal remaining. The thickness should be measured and compared with the original steel thickness.

Destructive tests leave holes that must be repaired but choosing a non-destructive method allows investigation in more places and is a much quicker process.

The Elcometer Ultrasonic Thickness gauges allow the accurate measurement of the effects of erosion and corrosion when only one side of the material can be measured.

THE THEORY

In 'A' the sound wave travels from the probe through the material to its back surface then returns. Coatings, rust or other layers on the back surface 'B' are completely ignored. Only the metal thickness is recorded.



The velocity of sound in steel is approximately $5900\text{m}\cdot\text{s}^{-1}$ but can vary depending on specification.

THE GAUGES

The Elcometer 205 & 206 Ultrasonic Thickness Gauges can measure materials including steel, cast iron, plastic, epoxy resin and glass fibre. The Elcometer 208 Ultrasonic Gauges have been specifically designed with the capability to measure material thickness while eliminating the thickness of the coating on metal substrates. All gauges are robust, fully portable and accurate with data output options and a backlit display for clear readings in the darkest of environments.



Non-destructive testing using ultrasonic gauges, allows accurate on-site tests to be carried out quickly and efficiently.

Elcometer 205 & 206 gauge improvements

The design of the ultrasonic transducer has changed. The wear face of the probe is now level with the end of the probe metalwork, extending the working life of the probe. The new style is a direct replacement for previous style probes.

Prestige cars need prestige gauges

Prestige cars are sold because they offer quality, luxury and are manufactured with attention to the detail. Strong yet light-weight aluminium chassis and components are protected from impact damage and corrosion by anodising before any paint is applied.

This process requires many measurements to ensure quality coverage and requires more than a general purpose gauge can offer. The Elcometer 355 Coating Thickness Gauge in conjunction with the Anodiser's Probe (N4) are the right choice for this application.



After anodising and drying, as the warm components cool, the thickness is confirmed. The long-term stability of the gauge and probe over these variable conditions has been found to be around 2 microns (0.04 mil). This meets the demands of the job specification and the calibration can be trusted over a long period, leaving more time for measuring.

The flat shape of the Elcometer 355 is ideal for placing on the bench, yet can still be handheld during a walkabout inspection.

Prestige cars offer nothing but the best. Their manufacturers demand the best and the Elcometer 355 provides it.

Drinks cans give the slip

Metal used in drinks cans is always coated firstly to prevent corrosion and also to label the product. Surface modifiers such as wax emulsion enhance the coating performance.



The coating on the exterior of cans requires special mobility or slip properties that allow them to move freely and quickly on the high speed production lines. Adding a lubricant to the coating via a surface modifier allows the manufacturers to use a low metal thickness while ensuring there is no unacceptable wear, abrasion or pinhole formation when the cans are in contact with each other through the manufacturing process and during transportation. To ensure the correct levels of surface modifier are used, the cans are tested in the laboratory.



Using instruments such as the Elcometer 1720 Abrasion, Scrubbing and Washability tester, coated metal samples can be tested with a variety of up to 4 tools at a time. The Elcometer Taber® 710 Multi-Finger Scratch / Mar tester is also used to establish the durability of the coating.

NEW PRODUCT Elcometer 331² Covermeter now with Half-Cell

After the successful introduction on the Elcometer 331 Covermeter, Elcometer are pleased to announce their latest model – the Elcometer 331² Covermeter with Half-Cell.

This allows users to not only identify the location, orientation, depth and diameter of rebar, but also the potential for corrosion, all in one easy-to-use gauge. The gauges store concrete cover and Half-Cell readings side by side in their extensive memories. The powerful CoverMaster[®] software completes the inspection package making this perhaps the most versatile and cost-effective Covermeter on the market today.



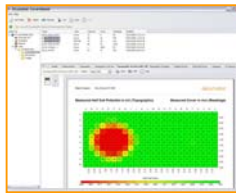
Elcometer 331 with Covermeter search head attachment



Elcometer 311 with Half-Cell attachment

The Elcometer 331² gauges are designed with intuitive menus in multiple languages and are rugged and waterproof to IP65, making them tough enough to work in the harshest environments. Features include:

- Store up to 240,000 readings across 1000 batches of both cover and Half-Cell measurements on the same gauge.
- A backlit graphic display clearly shows grid and linear batches, graphic plots, statistics and numerical readings of cover and Half-Cell, aiding on-site survey progress.
- Fully interchangeable search heads with automatic head detection allows quick changes on site – no need to return the gauge to the factory.
- Half-Cell kits are available as either a copper electrode in copper sulphate solution (Cu/CuSO₄) or silver electrode in silver chloride solution (Ag/AgCl) and come with a 5-year warranty.
- Stored data can be transferred to PC into the CoverMaster[®] software, which provides the ultimate data management tool – store & compare Covermeter and Half-Cell readings along side other associated survey files such as photographs, text documents, spreadsheets, notes and more.
- Stored rebar ranges include Metric, Japanese, Canadian and US Bar Numbers.
- Covermeter and Half-Cell readings from one easy to use gauge – easier to carry and costs significantly less than two separate instruments.



For the new brochure on the Elcometer 331² Covermeter with Half-Cell please visit our website www.elcometer.com or contact BAMR at sales@bamr.co.za.

ASTM Galvanising Standard

ASTM have approved a new standard for the measurement of galvanised fasteners. ASTM F 2329 has been designed to compliment ASTM A 153/A153M *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*. This now brings the ASTM method in line with ISO 1416 which also uses thickness measurement as the primary determination of galvanising measurement, with weight per area (strip and weight) as the method for resolution of disputes.



The thickness method gives lower values than the strip and weigh method in part due to density variances but also because there is always a layer at the interface that is an alloy of zinc and iron and this is magnetic to some degree, giving a false zero under the zinc layer.

For practical purposes this is acceptable as the measured thickness is always a few microns less than the actual thickness and it is the actual thickness that determines the effective life of the galvanised coating.

The Elcometer 355 Coating Thickness gauges provide that accuracy required to meet these standards. The large memory capacity, storing up to 10,000 readings in 200 individually calibrated batches and statistical analysis makes the Elcometer 355 the ideal choice for precision coating thickness measurement.

WEEE directive update

In the January & June 2006 issues of [elconews](http://elconews.com) e-zine the new WEEE (Waste Electronic and Electrical Equipment) directives were outlined.

On the 25th July 2006, the draft WEEE regulations and guidance were published as part of the DTI's (Department of Trade and Industry) planned consultation process. B2B Compliance has been highly successful over the past two years and following the 12 week statutory compliance period, DTI intends to lay the regulations before UK Parliament in November, with the publication of the Final Regulations in December 2006.

From the end of May 2006, Elcometer Instruments Ltd have been members of the GAMBICA B2B Compliance scheme in accordance with these regulations.

Elcometer have published a policy statement at www.elcometer.com/downloads in respect of Elcometer's membership of the B2B scheme.

The DTI's consultation process should be of interest to European distributors as all other members of the EU are ahead of the UK government with their legislation for the WEEE directive.

Other countries are considering similar legislation such as Canada, Australia and China while the USA have formed a task group within ASTM to prepare standards for the USA.

For further information on the WEEE regulations and guidance, visit www.dti.gov.uk/consultations

Clean and rough surfaces - Part 3

Various techniques can be used to determine how much chemical contamination there is on a surface before the coating is applied.

CHEMICAL CLEANLINESS

Many modern water-bourn coatings will not adhere to a surface that has oil or grease. Compressed air systems to be used for blast cleaning and the abrasive must be completely oil free. When contaminants are already on the surface, washing or degreasing is necessary to remove them. A simple test for oil is with a thin piece of opaque paper such as that from a cigarette or newspaper. When pressed against some oil or grease, it becomes translucent. This change is most obvious when the paper is held against the light. This test does not detect very low levels of oil and grease on a surface so ultraviolet light can be used but it does not always work.

SALTS

Salts deposited as a fine powder are quite easy to remove. Crystals that have grown on a surface are more difficult and they don't dissolve easily. On steel, chlorine atoms have a very strong bond to the iron atoms, which can affect the results of a test, giving a lower reading. Apart from boiling the item (easier said than done), the tests for salts on a surface fall into two groups.



The first includes those requiring some turbulence to help the salts dissolve. A latex patch (Elcometer 138 Bresle Patch) or tube (Elcometer 134 Chlor*Test™) is fixed to the surface to provide a controlled area, to which a fixed amount of water or a special solvent is applied. This liquid is made to move for 1 or 2 minutes to dissolve as much salt from that surface as possible.



The second group of tests includes manual washing with a swab or soaking up the salt solution into filter paper (Elcometer 130 SCM400). These tests take about 2 minutes to complete.

The strength of the collected salt solution is determined by titration or conductivity measurement. A calculation results in the salt density, which is the mass of salt in a unit area. It must be said, each test method has some benefits and some difficulties, so selection should be based on the task. A very rough surface may cause the sample collector to leak, a warm surface may evaporate the solution, the cost per test may be important etc. The tests also have different efficiencies in dissolving the



salt, especially if there are deep corrosion pits on a horizontal surface. So, it is most important to record which method was used as well as salt per area found.

After testing, the surface should be cleaned and then re-tested. You need to be sure the salt was removed not simply transferred. The biggest problems are often on hot vertical surfaces and on horizontal ones; the salt can re-crystallise in the profile valleys.

WASH WATER

The test systems used for the density of salt on a surface can also be applied to test the water used to wash that surface. It would be pointless to put salt back after trying so hard to blast it off!



Ordinary water cannot be assumed salt-free. The quality of mains water around the world varies. What may be all right for making tea or coffee may be too salty for freshly blasted-cleaned steel.

To give an idea of how much salt is involved, water with 100ppm (parts per million) has 100g in 1000kg (1 cubic metre) water. If it washed 100m² and all that salt remained on this surface, there would be 1g/m² or 0.1µg/cm², a very low level according to present day practice. Another example: A high level of 10µg/cm² (100mg/m²) on a surface of 100m² is a total of 10g salt. When power washed with 100 litres of water, this results in a solution of 100ppm.

The wash water should be low in salt because when it evaporates from puddles, pits and profile valleys, it must not leave a high density of salt there. Testing the water before and after washing can be done using the Elcometer 134W, the Elcometer 130 and by the conductivity meter in the Elcometer 138.

Remember to consider the volume of water when calculating parts per million.

As the chemistry of coatings improved and a longer service-life became a reality, the focus moved to salt. Not many years ago, the density of salt on a surface was being restricted to 10µg/cm² (100mg/m²). These days, some specifications have a target of 1µg/cm². Chloride was the first salt targeted, especially in marine environments. Now people are also looking at the sulphate on inland industrial sites and at nitrates on structures on rural sites. Removing salt contamination from a surface before coating is extending the life of coating systems even more.

Quality control relies on good measurements and records to feed back the effects of various changes. This drives improvement. For this reason, salt testing will remain an important part of the pre-coating inspection procedure and an important part of the Elcometer range.

In the next issue of elconews e-zine the product group focus will be on the subject of bend and impact testers.