How to Measure Climatic Conditions using the Elcometer 319 Dewpoint Meter

If a coating is applied in the wrong climatic conditions this can affect its performance, resulting in flaws, problems with coating adhesion, and ultimately coating failure. This is why key climatic parameters should be monitored before and during application, to ensure conditions are suitable for painting.

For a long time this was and still is done using a whirling hygrometer, also known as a sling psychrometer, which measures the wet bulb and dry bulb temperature of the air, in order to then calculate the relative humidity and dewpoint temperature. Typically, you'd then use a separate thermometer to measure the surface temperature, in order to calculate the Delta T.

The Delta T is the surface temperature minus the dewpoint temperature, and is the primary climate parameter within the coatings industry. It is generally accepted within the industry that the Delta T should be at least 3°C (5°F) or higher for the coating to be applied, otherwise there could be condensed moisture (or dew) on the surface that would negatively affect the coating's performance if it were to be applied on top of it.

But with multiple pieces of equipment, and the need to use conversion tables and calculations to obtain your results, surely there's a more effective way to monitor climatic conditions than this.

There is: the Elcometer 319 Dewpoint Meter.

Before we get started, for the full details on all the climatic parameters, why we measure them, and the different methods of doing so, make sure you check out our introduction to climatic testing video – but if you just want to know about the Elcometer 319 Dewpoint Meter, then keep watching.

Whether using as a handheld dewpoint meter, or as a remote data logging monitor, the Elcometer 319 can monitor and record all of the key climatic parameters simultaneously, telling you if conditions are suitable for painting.

The Elcometer 319 is equipped with an air temperature and humidity probe, a surface temperature probe, and a K-Type connector, which allows you to connect additional external probes such as magnetic surface temperature probes or liquid temperature probes.

That means this single gauge can measure and record:

- Surface temperature (Ts), the temperature of the surface to be painted;
- Air temperature (Ta), the temperature of the air surrounding the surface to be painted;
- % Relative Humidity (RH), the amount of humidity present in the air compared to the maximum possible, expressed as a percentage;
- Dewpoint (Td), the temperature at which moisture condenses on a surface, calculated from the air temperature and % Relative Humidity;
- Delta T (TΔ), the difference between the surface temperature (Ts) and the dewpoint temperature (Td);
- Wet bulb temperature (Twb), calculated from surface temperature and relative humidity;
- And Dry bulb temperature (Tdb), equal to air temperature.

The gauge is dust and waterproof with fully sealed sensors, equivalent to IP66, and can safely be used in a wide range of climates. And unlike the whirling hygrometers, which you have to spin around to obtain measurements, the Elcometer 319 can be held against the substrate, or even

attached using the integrated magnets, allowing you to measure the climatic conditions of the localised area around the substrate being painted, so you can obtain more relevant readings.

To inspect using an Elcometer 319, simply switch on the gauge, and, just like you need the thermometers of a hygrometer to acclimatise to an environment, allow the sensors of the Elcometer 319 some time to acclimatise to your environment - especially if the gauge has been brought from a cold environment to a hot environment (say, from an air conditioned office out into direct sunlight for example), or vice-versa.

Be sure to keep your fingers away from the sensors at the top of the gauge at all times to avoid your body heat affecting the results, and when using the in-built surface temperature probe, hold securely against the surface until the Ts reading has stabilised. How do you know the reading has stabilised? Typically when the arrow next to the Ts reading disappears. In fact if any of the parameters trend up or down, the gauge clearly displays this using these arrows, so it's easy to keep track of how the environment is changing, or indeed, not changing.

While measurements are taken for all climatic parameters at all times, you can customise the main screen of the gauge to display up to five parameters of your choice, so only the data you need is on-screen. Then it's just a simple case of checking the readings are within your specification; with the Elcometer 319 allowing you to hold the measurements on-screen to allow you to make a note of them; or, even better, save them into internal memory.

While it's important to monitor the conditions before you start painting, it's equally important to continue to monitoring whilst the job is ongoing, as conditions change throughout the day. That's why the Elcometer 319 Model T can continuously monitor and record the conditions as you paint using its Interval Logging feature, taking a reading automatically at rate of your choice between 1 second and 24 hours. If you wish to continuously log the surface temperature, we recommend using an external surface temperature probe with this feature, so it remains securely attached to the surface without needing to be held.

What's more you can set high and low limits on any and all parameters, so the Elcometer 319 instantly alarms whenever a parameter exceeds specification.

And, once the inspection is done, every reading of every climatic parameter can be transferred via USB or Bluetooth to ElcoMaster®, Elcometer's free data management software for Android and Apple mobile devices, or PC, allowing you to further analyse the data and create professional inspection reports instantly.

Thanks to ElcoMaster® it's even possible to remotely monitor the Elcometer 319 live, while it's logging the conditions, creating a mobile climate station. And by setting limits within ElcoMaster®, the moment one of the parameters falls out of specification, as long as you're connected or within Bluetooth range, you'll be able to see instantly.

For more information on the Elcometer 319 Dewpoint Meter, simply visit Elcometer.com or click on one of the links on-screen.

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