

# ROTRONIC APPLICATION NOTE

Application note: N° F052

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## Spray paint booth

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### Curing and drying:

Curing and drying are two different things. When paint dries, the carrier will evaporate (along with the stabilisers that prevent the paint from drying out). Once evaporated, the curing starts: a process where the paint joins together and forms a protective coating.

## Paint booths in general

Spray painting has existed since the late 1800's. The technique was developed in a bid to accelerate painting times compared to brush painting. Spray painting is a method of painting where paint is atomised onto a surface via a spray gun. The paint is mixed together with a solvent or water (called a carrier) so that it can be applied correctly.

Cars, aircraft, boats and other such equipment is often spray painted in a spray paint booth.

A spray booth is an enclosed room, designed for spray painting. Depending on the

requirements, the booth may be equipped with filtered air to avoid getting dust in the room and an exhaust air system to clear the fumes of any evaporating solvents used during the spray painting process.

Regulations, such as the Occupational Safety & Health Administration from the United States department of Labor have a criteria for design and construction of spray booths state that a spray booth is: a power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapour and residue,

## Why the need to measure humidity?

In order for paint to dry correctly within the paint booths, the relative humidity and temperature levels should be with-

in the following conditions:

- 65 to 75%rh
- 20 to 24°C

Based upon the intake air, there may be a requirement to either dry or humidify the air in order to reach the desired values. From the temperature side, exactly the same thing: the air might need to be cooled or heated depending on the outside temperature.

Additionally, paint booths might have a separate monitoring system inside the booths in which the different elements are painted. In order to ensure that the paint is



Spray paint booth

and to safely conduct or direct them to an exhaust system.

Spray paint booths regulate relative humidity, temperature, airflow and pressure to ensure a quality coating and a perfect curing.

Certain paints contain flammable solvents which release flammable fumes: in this case explosion-proof components are required for all measuring equipment that come in contact with the fumes.

applied correctly to the element to be painted, it is important to ensure that the surface temperature of the element is not too close to the dew point level in the booth.

If the surface temperature of the element to be painted is close to the dew point temperature, then there will be risks of condensation forming on the surface of the element. If this were to happen, the coating will not be optimal and the drying and curing phase will not be completed properly and the results could be catastrophic.

## Paint Dry & Cure Times

Water Based/Latex Paint - Dry Time 1-2 hrs | Cure Time 21-30 days

Oil Based Paint - Dry Time 6-8 hrs | Cure Time 3-7 days

Chalk Brand Paints - Dry Time 30-60 min | Cure Time 30 days

Homemade Chalky Paint - Dry Time 1-2 hrs | Cure Time 21-30 days

Milk Paint - Dry Time 30-60 min | Cure Time 30 days

## What solutions can Rotronic offer?

Rotronic offers a range of products for relative humidity and temperature measurement. For spray paint booths, there is a requirement for transmitters, to control the heating, cooling, humidification and dehumidifi-

cation of the air.

Apart from that, Rotronic also offers a range of loggers for room monitoring.

Finally Rotronic also offers a range of portable devices for surface temperature meas-

urements.

To complete the deal, Rotronic also offers a monitoring software that can be used for monitoring the room conditions .



## Rotronic products:

### Handheld & surface temperature probe:

- **TP22**  
Handheld device for interchangeable PT100 probes.
- **AC1913-A**  
Kapton Foil probe  
-50...120°C  
PT100 class A

### Datalogger:

- **HL-NT**  
47'000 data records /MB  
1..7 interchangeable probes  
Various analogue outputs, buzzer and LED indication  
All psychrometric calculations  
FDA 21 CFR Part 11 / GAMP 4 compliant  
Display...

### Probes:

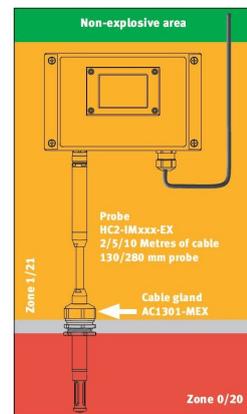
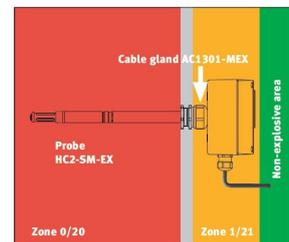
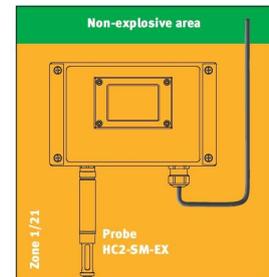
- **HC2-S**  
-50...100°C,  
0...100%rh,  
Ø15mm,  
±0.8%rh and ±0.1K...
- **HC2-IM102**  
-100...200°C,  
0...100%rh,  
±0.8%rh and ±0.1K,  
2m cable,  
Stainless steel housing...

### Transmitters:

- **HF5 series**  
For interchangeable probes,  
2 or 3/4 wire configuration,  
Various analogue and digital outputs,  
All psychrometric calculations available...

### ATEX setup:

- **HF520-EX**  
ATEX II 2(1) G Ex eb mb [ia Ga] IIC T5 Gb  
ATEX II 2(1) D Ex tb [ia Ga] IIIC T80°C Db
- **HC2-SM-EX**  
ATEX II 1/2 G Ex ia IIC T5 Ga/Gb  
ATEX II 1/2 D Ex ia IIIC T80°C Da/Db IP66



## Customer benefits:

### Accuracy:

Choosing Rotronic gives you the best accuracy on the market.

Precise humidity measurements can be obtained: meaning that the quality of the painting will remain outstanding with regards to the relative humidity and temperature requirements.

Additionally the accuracy will lead to lower electricity costs based upon the fact that the

air conditioning system will only be used when necessary.

### Communication:

With all of the different communication methods, from RS-485, Wireless to Ethernet RJ45, Rotronic can provide the solution for each installation.

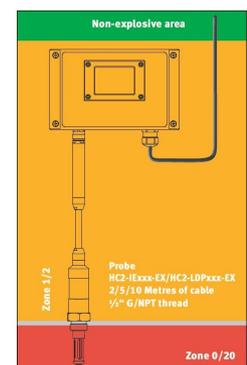
### Long term stability:

A long term stability with a drift under 1%rh per year (depending on the environ-

ment).

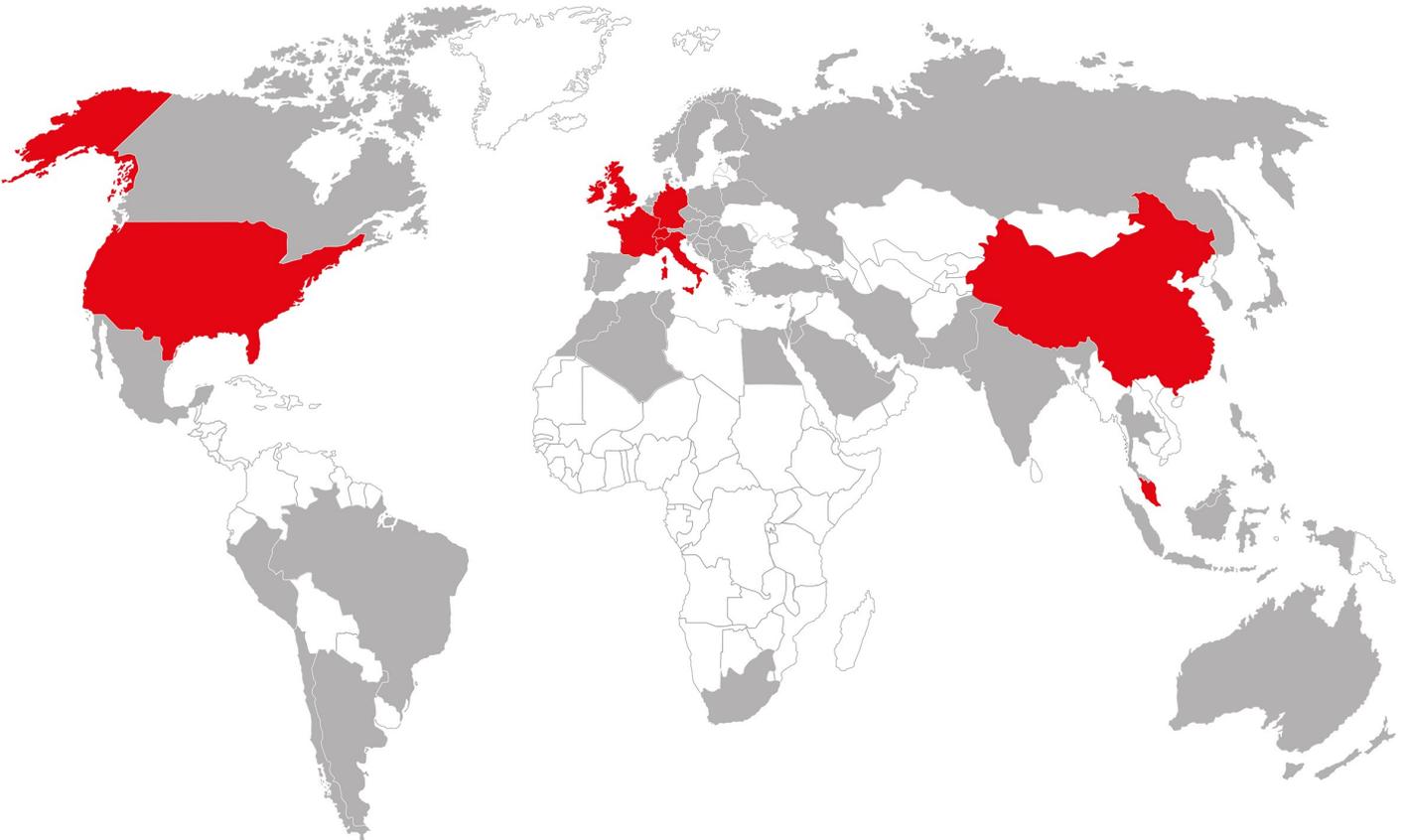
### Calibration and adjustment:

All of the Rotronic products are digital so the whole calibration procedure can be done via a PC, or directly from the device with the help of the Rotronic humidity standards. Rotronic can also offer an ISO-17025 calibration.



## Contact us:

Rotronic is represented in more than 40 countries around the world. An up to date list of all our partners is available at [www.rotronic.com/international](http://www.rotronic.com/international)



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