TQC sheen

CurveX Oven Loggers & Accessories

INDUSTRIAL PHYSICS

Protecting Product Integrity

Introduction

Oven profiling allows production sites to monitor their paint cure oven temperatures and provide valuable insights into oven performance and the drying time of coated products. Such insights can improve operations for curing ovens and the production processes around their coated products.

All probes are made of premium grade thermo couple K wire, which guarantees the highest accuracy available. High class magnet and springs are used that do not disintegrate or lose force at high temperatures. The various probe types allow measuring on every part regardless of its shape or size.

Importance of oven profiling

Oven profiling has been fundamental across the coatings industry, and the latest technological developments can provide production managers and engineers powerful information about their production processes.

To guarantee finish quality, it is necessary to collect accurate information about the temperatures being experienced by a coated product throughout the oven curing process. Each powder coating will have a specific cure information (time and temperature values), provided by coating manufacturers.

In order to collect temperature information that the coated product is experiencing, an oven temperature data logger must travel with the product – providing a complete in-process journey, profiling the oven temperatures, its performance with real and accurate data.

Information captured by an advanced oven data logger system can:

- Identify temperature fluctuations
- Reduce fuel costs and save money – by increasing line speeds or lowering oven temperatures
- Optimise production processes
- Have data to prove product quality and meet specification

Information obtained by a oven temperature system allows users to better control, understand and optimize their oven processes, as well as ensure the finest coating quality for their finished products.

Energy savings

Our TQC-Sheen CurveX temperature data loggers provide highly valuable insights into how efficient a customer's industrial oven is running and the drying time of their product.

Such insights can lead to dramatic improvement in the production processes. From reducing the time the coated product is in the oven or reducing the oven temperature to run more efficiently – either way, leading to huge economic and energy savings for business operations.

The oven profiling information obtained by our TQC-Sheen CurveX temperature data loggers allows users to quantify the energy required in the curing reaction of their products. Understanding the oven efficiency and curing reaction time can result in huge improvements to operations.

By either lowering the set temperature of the curing oven or increasing the production speed – both will result in a lower energy consumption per coated product.

Read on to learn more about our TQC-Sheen CurveX oven temperature systems or contact us directly to find out how we can support your coating operations.

Easy Return on Investment – economic improvements to manufacturing processes

Reduce costs – energy consumption and wasted time

Obtain valuable insights into the curing time of your coated product

CurveX 4 Oven Data Logger

The CurveX 4 oven logger offers easy-to-use, high quality temperature data logging for paint curing ovens.

The oven data tracker is fitted with three large buttons for easy operation and three LED giving power, paint type, logging and cure information.

The CurveX 4 provides advanced oven temperature data. Combined with the Ideal Finish Analysis software, this data logger is vital for any paint curing oven – providing insights into oven temperature efficiencies, streamlining operations and reducing operation costs.

The 8-channel temperature data logger built in a sturdy machined aluminium case that fulfils the basic needs for quality control in powder coating applications. Its ease of use and affordable price level makes it the ideal job-coaters instrument.

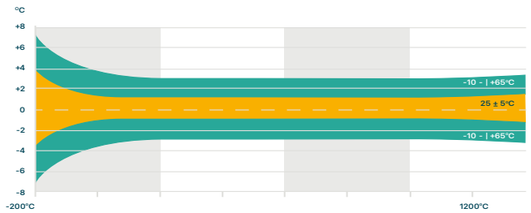
Features

- Advanced software with Curve index number
- Operate through only 3 large buttons
- 8 channels
- Meaningful feedback of multi coloured LEDs
- Factory calibrated for immediate use
- Downloads data through a standard USB port
- Rechargeable battery pack through USB connector
- Large memory of 20x 50.000 readings
- Programmable “paint type” memory for immediate “pass / fail” result
- Compatible with Ideal Finish Analysis software

Ordering Information

CX4005: CurveX 4 Oven Logger

CurveX4 Logger operation measurement



Scope of supply

CX4005: CurveX 4 Oven Logger

- Ideal Finish Analysis Software
- Factory calibrated, calibration certificate (CL0018)
- USB-C Cable (GL0400)
- Plastic Carrying Case (CX3060)

Technical Specifications CurveX 4 Oven Logger

Dimensions:	110 x 85 x35 mm
Battery Life:	35h with rechargable batteries
Measuring range:	-100°C to 1200°C
Operating temperature:	0°C to 60°C
Display:	Three multi-colours LED’s
Memory:	20 batches with 50,000 readings
Interface:	USB-C
Interval time:	1 s to 60 min
Channels:	8
Mass:	190 g / 6.7 oz
Material:	Aluminium
Accuracy:	+/-1°C / 1.8°F
Power supply:	Rechargeable battery

CurveX 4 Oven Data Logger Kit

Profiling an industrial coating oven starts right here with the CurveX 4 Oven Logger Kit. It contains all necessary items, just add the desired magnetic or clamp-type probes to make the oven logger kit complete.

The main component of the kit is the CurveX 4 Oven data-logger which offers easy-to-use, high quality temperature data logging for paint curing ovens. Measurements, analysis levels and report options are fully customizable to provide you with tailor-made information on the quality of your curing processes.

The oven temperature data logger is placed in an insulated box and as it oases through the oven with the work piece and it can measure the temperature in several places on the surface of the product simultaneously. Several probes for measuring the ambient temperature and the temperature of the product can be connected to the data logger. These include magnet, clamp, ringtype and wire probes.

The CurveX 4 provides advanced oven temperature data. Combined with the Ideal Finish Analysis software, this data logger is vital for any paint curing oven – providing insights into oven temperature efficiencies, streamlining operatations and reducing operation costs.

Suited for industrial oven and laboratory oven temperature profiling. Mandatory test in Qualicoat, QIB, and GSB accredited laboratories.

Features

- High Quailty temperature data logging
- CurveX Oven Logger Kit configured to start oven temperature data logging in paint and powder coating curing oven applications – just add your probes to complete it!
- CurveX 4 data logger includes 8 channels – with Ideal Finish Software
- Insulation box with degassed silicone materials suitable for powder coating applications
- For absolutely silicone free or high temperature applications – select your insulation box
- Document and prove process quality following Qualicoat, GSB, ISO 9001, QIB etc. and create outstanding quality reports with the included advanced analysis software

Ordering Information

CX4010: CurveX 4 Oven Logger Kit

Scope of supply

CX4005: CurveX 4 Oven Logger

- Ideal Finish Analysis Software
- Insulation Box 300°C (CX2005)
- Energy Absorber (CX2011)
- Silicone Seal (CX2071)
- Case (CX3060)

Temperature Profile Insulation Box

Dimensions:	Depth: 255 mm / 10.04 inch Width: 225 mm / 8.86 inch Height: 140 mm / 5.51 inch
Max Temperature:	300°C / 572°F

The CurveX Family Evolution

The CurveX family of products has evolved over the years! We are continually striving to improve and develop our range of CurveX data loggers to ensure that we provide best oven temperature efficiencies and insights on the market place.

Over the years, you can see how we have developed the CurveX models, as well as the Ideal Finish Analysis software that accompanies the logger.

CurveX Oven Data Logger Model	CurveX 1 (1998)	CurveX 2 (2004)	CurveX 2 (2006)	CurveX 3 (2015/2016)	CurveX 4 (2022)
					
	CurveX 1 6 channels			**CurveX 3 Basic** 4 channels	**CurveX 4** 8 channels
					*CurveX 4 Pro coming later this year*
		CurveX 2	**CurveX 2**	**CurveX 3 Standard** 6 channels	
		+ 6 Channel Add-on			
Connection type	 Jack Cable		 USB-B cable		 USB-C cable
Ideal Finish Analysis Software	Ideal Finish Analysis Software Version 4		Ideal Finish Analysis Software Version 7		
			Ideal Finish Analysis Software Version 8		
	Runs on 32 bit systems		Runs on Windows systems including 10 & 11		
Battery type	 E, 9V	 3x AA Batteries		 Lithium-ion	 2x AA Batteries

Temperature Probes For CurveX

CurveX temperature probes are specifically designed to measure oven air temperature and the part surface temperature in an oven.

All probes are made of premium grade thermo couple K wire, which guarantees the highest accuracy available. High class magnet and springs are used that do not disintegrate or lose force at high temperatures. The various probe types allow measuring on every part regardless of its shape or size.

Clamp


CX2020


CX2030


CX2041


CX2046


CX2048


CX2095


CX2097

Magnet


CX2050


CX2055


CX2068


CX2096

Ring


CX2065


CX2085


CX2090

Wire


CX2063


CX2087


CX2094


CX3145

Max Temperature range	Measurement type	Length (mm)	1000	1500	3000	5000	10500	Custom
Max temp 250 degree C	Surface Temperature	Clamp	-	-	-	-	-	-
		Magnet	-	-	-	-	-	-
		Ring	-	-	-	-	-	-
	Air Temperature	Clamp	-	-	-	-	-	-
		Magnet	-	-	-	-	-	-
		Wire	CX3145 set of 6 probes	-	-	-	-	-
Max temp 300 degree C	Surface Temperature	Clamp	-	CX2046 klem 50mm (CX2030)	CX2040	CX2041	CX2045	-
		Magnet	-	CX2050	CX2060	CX2062	CX2061	-
		Ring	-	CX2065	CX2066	CX2072	-	-
	Air Temperature	Clamp	-	CX2020	CX2021	CX2022	CX2026	-
		Magnet	-	CX2069	CX2068	CX2073	-	-
		Wire	-	CX2063	CX2064	CX2067	-	-
Max temp 480 degree C	Surface Temperature	Clamp	-	CX2048	CX2049	-	-	-
		Magnet	-	CX2055	CX2056	-	-	-
		Ring	-	CX2085	CX2086	-	-	-
	Air Temperature	Clamp	-	CX2023	CX2024	-	-	-
		Magnet	-	-	-	-	-	-
		Wire	-	CX2087	CX2088	-	-	-
	Surface Infra-red temperature	Clamp	-	CX2095	-	-	-	-
	Air Infra-red temperature	Magnet	-	CX2096	-	CX2099	-	-
		Clamp	-	CX2097	-	CX2098	-	-
Max temp 1000 degree C	Surface Temperature	Clamp	-	-	-	-	-	-
		Magnet	-	-	-	-	-	-
		Ring	-	CX2090	CX2091	CX2092	-	-
	Air Temperature	Clamp	-	-	-	-	-	-
		Magnet	-	-	-	-	-	-
		Wire	-	CX2093	CX2094	-	-	-

Technical Specifications Temperature Probes for Curvex

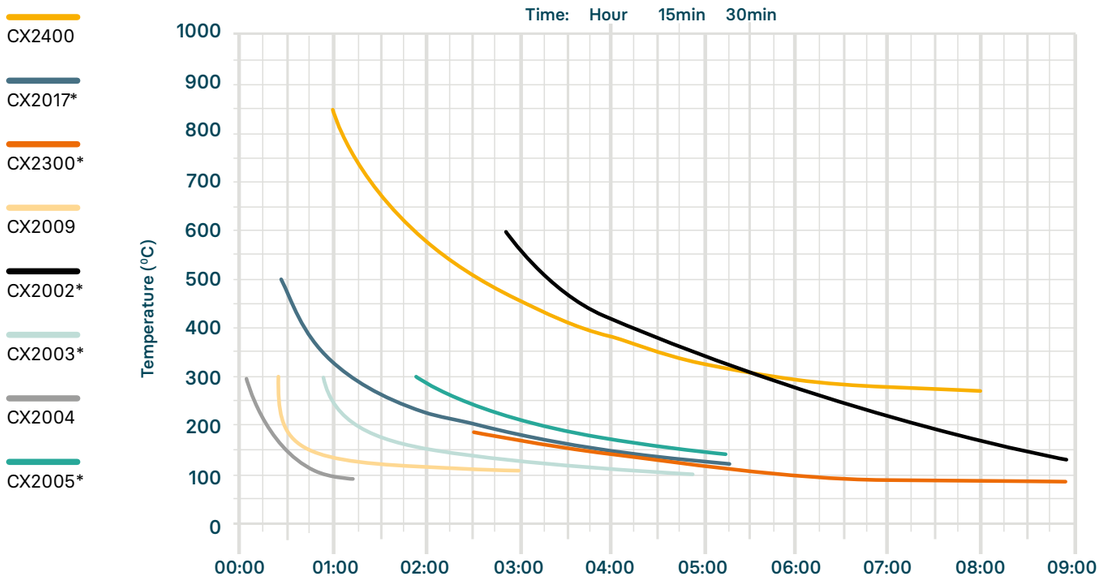
Probe type:	Thermo couple K	Temp Range:	-40 to 375°C / -40 to 707°F
Connector:	K type miniature plug	Tolerance Value:	-40 ±1.5°C / -40 ±2.7°F
Material:	Nickel-Aluminium Nickel-Chromium	Temp Range:	375 to 1000°C / 707 to 1832°C
Accuracy:	Class I Premium grade	Tolerance Value:	±0.4% Reading / ±0.4% Reading

Insulation Boxes For CurveX

CurveX insulation boxes are specifically designed to protect the CurveX loggers against the harsh environment in industrial ovens.

All insulation boxes are made of a polished stainless steel outer box filled with micro porous insulation material to prevent the oven heat to penetrate the aluminium inner box. Inside the aluminium inner box a high density media heat sink collects any excess of heat and keeps the CurveX logger at an acceptable operating temperature for a long period of time.

Insulation curves



* Tested in combination with the energy absorber CX2011 (high density energy collecting media) with a start temperature of 20°C (68°F)

Features

- Excellent logger protection against oven heat
- Ferro plate for holding the magnet probes when not in use
- Mounted cable hook allows the storage of surplus cable length

Technical Specifications Insulation Boxes for CurveX

Outer box material:	Polished Stainless steel
Insulation material:	Micro porous silica
Inner box material:	Anodised aluminium

Accessories / Spares

- CX2011: Heat sink LDPE for insulation box CX2002, CX2017 and CX2005
- CX2012: Extra heat sink for insulation box CX2002
- CX2013: Heat sink LDPE Add-on module for insulation box CX2002, CX2017 and 2005
- CX2014: Heat sink U-shaped for insulation box CX2003


CX2002


CX2003


CX2004


CX2005


CX2009


CX2400

Ordering Information Insulation Boxes for CurveX

CX2004* ** Dimensions	**CX2009*** Dimensions	**CX2003*** ** Dimensions	**CX2005** Dimensions
Depth: 240 mm / 9.45 inch	Depth: 240 mm / 9.45 inch	Depth: 255 mm / 10.04 inch	Depth: 255 mm / 10.04 inch
Width: 105 mm / 4.13 inch	Width: 105 mm / 4.13 inch	Width: 225 mm / 8.86 inch	Width: 225 mm / 8.86 inch
Height: 50 mm / 1.97 inch	Height: 60 mm / 2.36 inch	Height: 70 mm / 2.76 inch	Height: 140 mm / 5.51inch
Approximate Weight: 1600 g / 3.53 lbs	Approximate Weight: 1700 g / 3.75 lbs	Approximate Weight: 2650 g / 5.85 lbs	Approximate Weight: 4200 g / 9.26 lbs
Insulation Curve: A	Insulation Curve: B	Insulation Curve: C	Insulation Curve: D
Heat Sink: Included	Heat Sink: Included	Heat Sink: CX2004***	Heat Sink: CX2009*
Max Temperature: 300°C / 572°F	Max Temperature: 300°C / 572°F	Max Temperature: 300°C / 572°F	Max Temperature: 300°C / 572°F

* Only suitable for CurveX 3 Basi. ** To be ordered separately.
*** Not suitable for the CurveX 3 Standard.

Ordering Information for absolute sillicone-free Insulation Boxes for CurveX

CX2300 Dimensions	**CX2017** Dimensions	**CX2002** Dimensions	**CX2005** Dimensions
Depth: 240 mm / 9.45 inch	Depth: 240 mm / 9.45 inch	Depth: 280 mm / 11.02 inch	Depth: 540 mm / 21.3 inch
Width: 225 mm / 8.86 inch	Width: 225 mm / 8.86 inch	Width: 230 mm / 9.06 inch	Width: 360 mm / 14.2 inch
Height: 140 mm / 5.51 inch	Height: 140 mm / 5.51 inch	Height: 180mm / 7.09 inch	Height: 250 mm / 9.8 inch
Approximate Weight: 4200 g / 9.26 lbs	Approximate Weight: 4200 g / 9.26 lbs	Approximate Weight: 180mm / 7.09 inch	Approximate Weight: 32 kg** / 70.55 lbs
Insulation Curve: E	Insulation Curve: F	Insulation Curve: G	Insulation Curve: H
Heat Sink: CX2011*	Heat Sink: CX2011*	Heat Sink: CX2011*/CX2011*	Heat Sink: Included
Max Temperature: 180°C / 356°F	Max Temperature: 500°C / 932°F	Max Temperature: 500°C / 932°F	Max Temperature: 850°C / 1562°F

* To be ordered separately. ** Incl. heatsink.

CurveX 3 Nano

The CurveX 3 Nano is a 4-channel oven recorder specially designed for can coaters.

When coating cans, the time-temperature cycle must be controlled carefully. Together with the cans, the CurveX Nano oven recorder travels through the conveying system in the oven and creates a complete temperature profile.

With the help of paint cure specifications, it determines the curing process by calculating the cure index for you – enabling a simple pass / fail set-up. From a computer, you can analyse all gathered data with the Ideal Finish Analysis software and print a report with all measurement data and graphs.

4-Channels

The CurveX 3 Nano has four thermocouple type K inputs to be used to measure either surface- or air temperature. The CurveX 3 Nano comes complete with 4 wire probes and self-adhesive attachment pads to position the probes. Each probe can be used for either surface or air temperature. The probes are usually attached to a real can on the next pin.

Housing

The CurveX 3 Nano is built into a stainless steel casing and has a can shaped form factor. This form factor allows the data logger to be used in a variety of can oven setups. Usually the cans traverse through the production process by placing them over pins, the pins in turn are attached to a big chain that runs through the whole production line. The housing at the same time functions as insulation box. Unlike our other CurveX products the Nano does not need a separate insulation box.

Inside & Outside Can Coatings

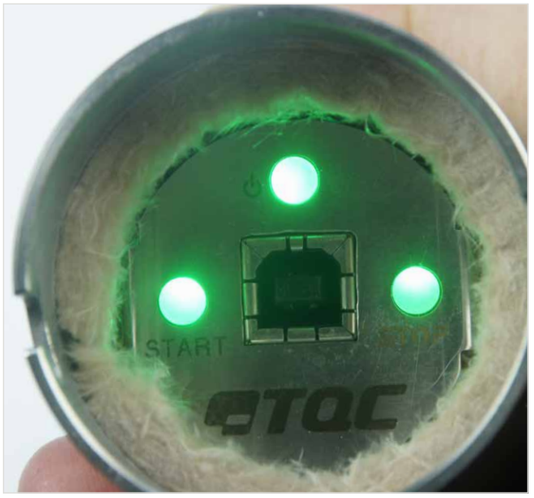
Typically the cans are painted both on the in- and outside. This is done in 2 different production processes. The CurveX can be used in both of these processes.

Inside End-caps

During the first step, painting the inside, the cans are placed in trays that traverse through the first oven. The Nano is supplied with end-caps that allow the data logger to be placed in the tray. With these end-caps the data logger is completely cylindrical in shape.

Outside End-caps

To allow for easy installation into the production line and to reduce down time to a minimum, the CurveX 3 Nano has a special set of end-caps with adjustable fittings. These end-caps allow the data logger to be slided over a pin. Once in place, the position on the pin can be quickly fixed with 2 butterfly bolts.



Features

- Operate through only 3 buttons
- Meaningful feedback of multi colored LED's
- Factory calibrated for immediate use
- Downloads data through a standard USB port
- Rechargeable battery pack through USB connector
- Large memory of max. 160.000 readings
- Memory for 10 different batches, automatically overwrites the oldest results
- Programmable "paint type" memory for immediate "pass / fail" result
- Round design, only 53 mm in diameter, for use in can ovens

Ordering Information

CX3040: CurveX 3 Nano Oven Logger for Can Coatings

Scope of supply

CX3040: CurveX 3 Nano

- Factory calibrated, calibration certificate included (CL0018)
- Ideal Finish Analysis Software license (CX5010)
- USB cable (CM1105)
- USB memory stick (GL0103)
- Plastic carrying case (CX3060)
- 4x Thermocouple wire probes (CX9090)
- Set of 25 Self-adhesive attachment pads (T=250°C/482°F) (CX2205)

Ideal Finish Analysis Software

Ideal Finish Analysis Software

Obtaining temperature data is only part of the journey to understanding your oven.

Whilst the temperature data logger has done the important first step in retrieving the data, this then needs to be analyzed and evaluated in order understand what is happening to the product's coating. From there, this can give valuable insight into how production processes can be improved and run more efficiently.

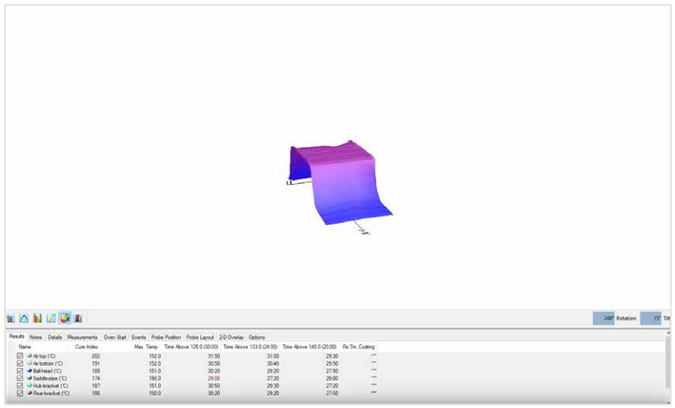
The TQC-Sheen Ideal Finish Analysis Software is the most advanced coating climate, coating cure and coating thickness monitoring software package available today. With two user levels Ideal Finish Analysis offers user friendly reporting functions for standard production work as well as advanced calculations for in depth analysis of the climate parameters prior to coating, the curing process and oven performance during coating and the thickness after coating. Detailed graphic representations and customizable reports help you to make the right decisions to optimize your production process.

Not just a reporting software

from cure analysis and gloss analysis, to thickness analysis and climate conditions. The Ideal Finish Analysis software is a comprehensive tool used across multiple products and applications.

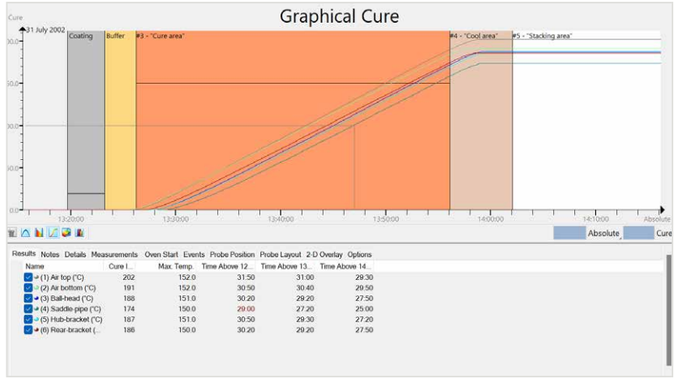
For the CurveX product range, the Ideal Finish Analysis software is a total set-up system, allowing users to modify oven and production conditions.

There is no limit to oven profiling and curing analysis. The software can be used for setting up the conditions for each production line and oven, from the physical lengths of the lines and their speeds, to the number and types of ovens. Users can also set-up different paint types that are in use, as well as the probes that are in-use and where they are laid out on the product.



3D Cure Graph

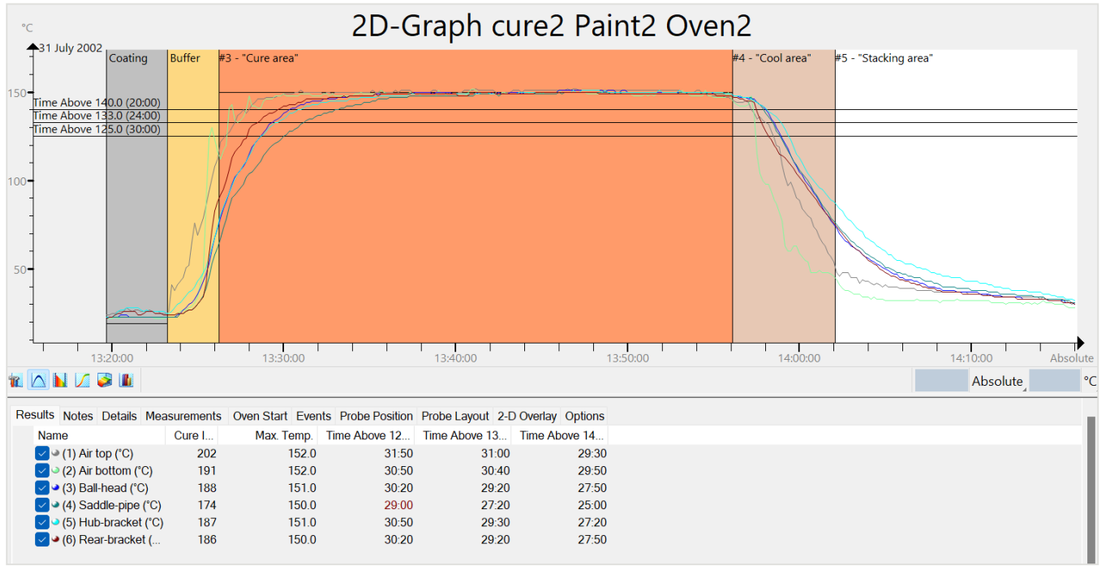
Graphical Cure



Simulate Oven Changes

Obtaining temperature data is only part of the The Ideal Finish Analysis software not only allows you analyse real oven production results, but it also allows users to simulate any oven changes.

In the Ideal Finish Analysis software, users can set-up different production scenarios such as with oven specification changes, production line speed changes, temperature changes and analyse what the results would look like before making any real and costly changes. For example, a user could enter in the details of a new paint type they are considering to use, or mimic the oven conditions for another site to see the results. This is hugely beneficial for quality and operations to simulate production changes before actually implementing any physical changes. It gives users full control by allowing them to set-up different oven types, conditions, production lengths and speeds. The information can then be shared with colleagues from different sites across the world, by emailing the reported results.



Oven Profile Cure Graph

Reporting

The Ideal Finish Analysis has extensive reporting options that are perfect for Quality Assurance and Quality Control teams. Statistics can be displayed in various ways with a variety of graph options, and the can be focused on a specific stages in the oven.

Users can implement their company logo, include product images of the product/component being tested and produce detailed reports with multiple graphs, layouts and data. Reporting options can be advanced or basic, and users can select the types they want to include, such as: Logger ID, calibration dates, number of probes, batch numbers and more. Additionally, all raw data can easily be exported and shared with teams.

Features & Benefits

- Create detailed graphics and reports
- Customizable reports to help users make right decisions with improving production processes
- Allows users to play with temperature, speeds of production lines or switch paint types and simulate oven results
- No license key required – it is a key component of the CurveX family and other coating products manufactured by TQC-Sheen
- Frequently updated to keep up-to-date with latest developments in curing and corrosion prevention industry
- Runs on the latest operating systems

Ideal Finish Analysis is updated frequently to keep up with the latest developments in the coating and corrosion prevention industry and to comply with the latest operating systems. The latest version of the software is available for free on **www.industrialphysics.com**

Alternatively, scan our QR code to download the latest Ideal Finish Analysis software.

Case Study CurveX System

AGA Rangemaster is a leading international premium consumer which manu-factures and distributes some of the best known and loved kitchen appliances and interiors furnishings in the world. Lately they experienced a problem with colour match on one of their enamels.

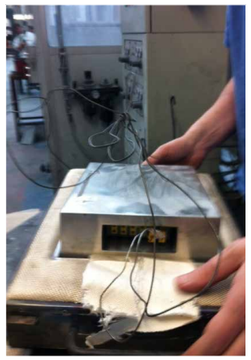
The Speedometer of the Oven
The CurveX system gives the necessary information on the activities inside the furnace. With the information gathered by the CurveX Datalogger combined with Ideal Finish Analysis software adjustments can be made and money saved.

> " We have used it already 50 times to study and balance our furnace. We have before and after curves where we have adjusted a 20 degree difference between the top and bottom of our furnace to 6 degrees. but also evened out cure index and time at temperature, we have found the software very useful for comparing data. We made adjustment to the burners to change the flame lengths to overcome this problem."

Besides changing the temperature and time AGA Rangemaster found out that if the furnace was heavily loaded the temperature curve was affected. This problem was gone un-noticed until they used the CurveX system.

> " We are now more self sufficient on setting the furnace burners and much better understanding of the things that can affect the furnace balance. Even to the point where we have calculated the Kg of enamel ware that the furnace can cope with from the Joules available in the gas input. We could reduce our track rate slightly to ensure we never had a net loss of energy imput to load but have at the moment not made a decision, as it is only under certain circumstance now that the load can exceed the gas."

Now the issue is resolved they will use the datalogger once a week to check the furnace is not drifting back to where they had a problem.



Support & services

We believe that supplying you with high quality testing instruments is only part of our job. Being fast, efficient, and truly reliable is critical when it comes to servicing the technology that keeps your business running.

Wherever you are in the world, our experts are on hand to support your needs. From installation, through to calibration, repair, and preventative maintenance, we've got you covered.

That's because at Industrial Physics, we're not just suppliers, we are here for you as trusted partners.

Whatever your requirement may be, if you're looking for the highest quality of test and inspection solutions to ensure the quality of your products, the team at Industrial Physics are here to support you.

Get in touch

Find out more about how we can support your unique needs and get in touch today.

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