TQC sheen

CurveX Oven Loggers and 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 curing conditions of coated products. Such insights improve operations for curing ovens and enables efficiency boosts and energy savings.

Importance of oven profiling

Oven profiling has been fundamental across the coating 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 specific cure information (time and temperature values), provided by coating manufacturers.

In order to collect temperature information as experienced by the product, an oven temperature logger must travel with the products through the oven. This provides a complete in-process journey, profiling the oven temperatures and its performance with real and accurate data.

Information captured by an advanced oven data logger system such as the CurveX can:

- Identify temperature fluctuations
- Reduce energy costs and save money by increasing line speeds or lowering oven temperatures
- Optimize production processes
- Provides 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 highest coating quality for their finished products.

Energy savings

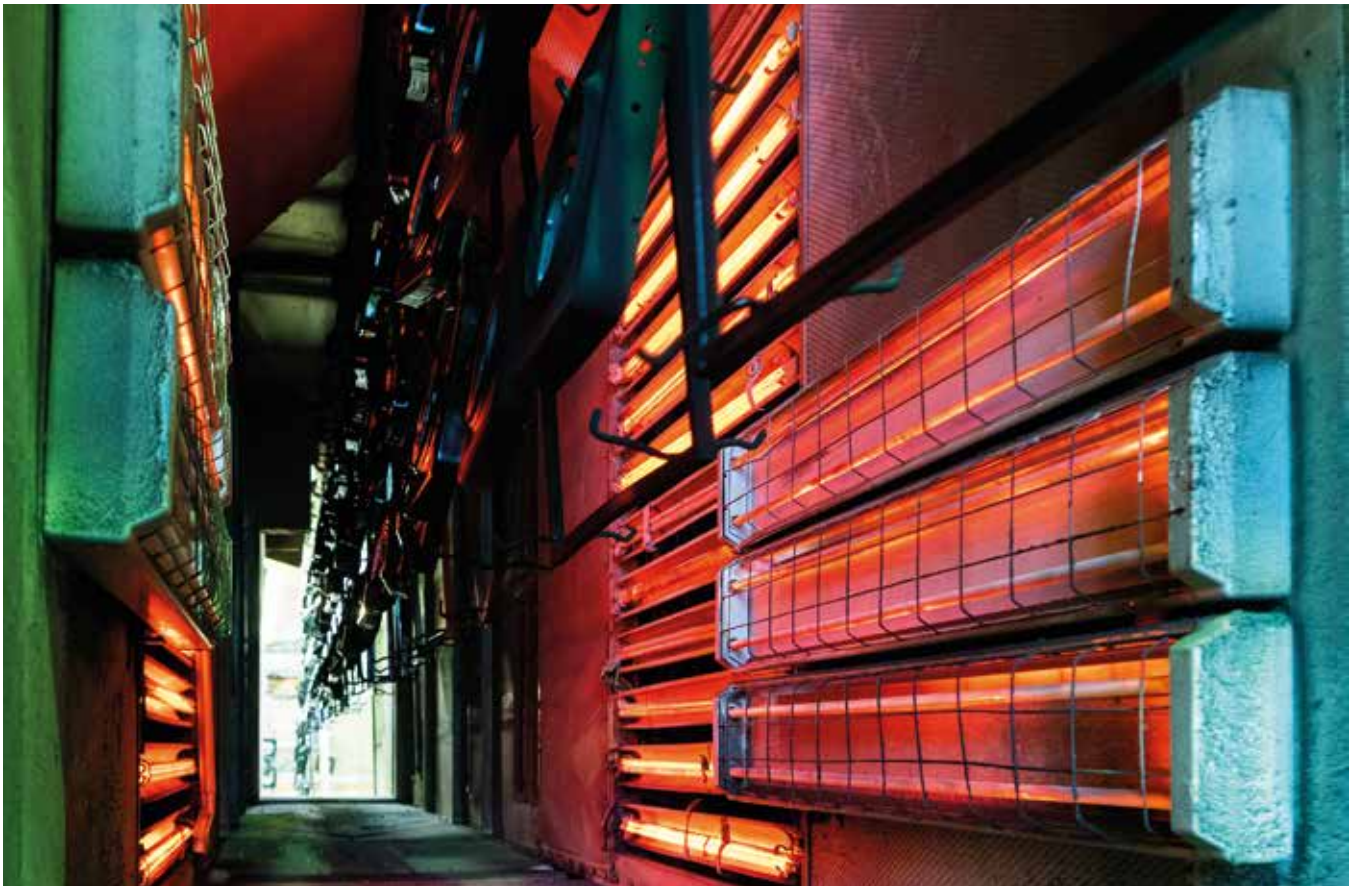
Our TQC Sheen CurveX temperature data loggers provide highly valuable insights into how efficient a customer's industrial oven is running and the curing process of their product.

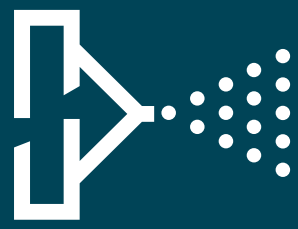
Such insights can lead to dramatic improvement in the production processes. From reducing the time the coated product is in the oven or reducing the oven temperature to run more efficiently – either way, leading to huge economic and energy savings for business operations.

The oven profiling information obtained by our CurveX temperature data loggers allows users to quantify the energy provided to 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 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 Temperature Data Logger

The CurveX 4 Oven Temperature Data Logger offers easy-to-use, high quality temperature data logging for coating curing ovens.

The oven data tracker is fitted with three buttons for easy operation and three LEDs indicating power, 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 coating curing oven – providing insights into oven temperature efficiencies, streamlining operations and reducing operation costs.

The 8-channel temperature data logger has a sturdy aluminum and plastic housing that fulfills the needs for quality control in coating applications. Its ease of use and affordable price level makes it the ideal instrument.

Features

- Ideal Finish Analysis software with Cure Index indicator
- Operated using only three buttons
- Meaningful feedback through multi-colored LEDs
- Eight temperature inputs
- Factory calibrated for immediate use
- Download data through USB-C
- Internal charging for 2 rechargeable AA batteries through USB-C
- Large memory for over a million readings of 8 channels
- Programmable “paint type” for immediate “pass / fail” result

Ordering Information

CX4005: CurveX 4 Oven Logger

Scope of supply

- CurveX 4 Oven Temperature Data Logger
- USB charger and cable
- Ideal Finish Analysis software
- Factory calibration certificate
- Plastic Carrying Case

When used in areas warmer than 60 °C, an insulation box and an energy absorber are a must-have.

Technical Specifications CurveX 4 Oven Logger

Dimensions:	110 x 85 x 35 mm
Battery Life:	35h with rechargable batteries
Measuring range:	-100 °C to 1200 °C
Operating temperature:	0 °C to 60 °C
Display:	Three multi-color LEDs
Memory:	More than 1 million readings
Interface:	USB-C
Interval time:	1 s to 60 min
Channels:	8 + internal temperature
Mass:	190 g / 6,7 oz
Material:	Aluminum / ABS
Accuracy:	± 1,0 °C / 1,8 °F

CurveX 4 Oven Data Logger Kit

Profiling an industrial coating oven starts right here with the CurveX 4 Oven Temperature Data 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 Temperature Data Logger which offers easy-to-use, high quality temperature data logging for coating 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 moves through the oven with the work piece and it can measure the temperature in several places on the surface of the product simultaneously. Up to eight probes for measuring the air or the surface temperature of the product can be connected to the data logger. The portfolio of probes includes magnet, clamp, ring type and wire probes.

The CurveX 4 Oven Data Logger Kit is well suited for industrial and laboratory oven temperature profiling. Mandatory test in Qualicoat, QIB, and GSB accredited powder coaters.

Features

- High quality temperature data logging
- Configured kit to start oven temperature data logging in paint and powder coating curing oven applications – just add your probes to complete!
- CurveX 4 Oven Temperature Data Logger for eight external channels
- Ideal Finish Analysis Software for data evaluation
- Insulation box with degassed silicone materials suitable for powder coating applications
- Absolutely silicone-free or higher temperature insulation boxes are available. See page 13 for details.
- Ideal to document and prove process quality following Qualicoat, GSB, ISO 9001, QIB and others.

Ordering Information

CX4010: CurveX 4 Oven Data Logger Kit

Scope of supply

- CurveX 4 Oven Temperature Data Logger
- USB charger and cable
- Ideal Finish Analysis software download
- Insulation Box 300 °C
- Energy Absorber
- Silicone Seal
- Case

Temperature Profile Insulation Box

Dimensions:	Depth: 255 mm / 10,04 in Width: 225 mm / 8,86 in Height: 140 mm / 5,51 in
Max Temperature:	300 °C / 572 °F

Temperature Profile Insulation Box

CX2071	Silicone seal
CX2011	Spare or extra Energy absorber

It is advised to have spare silicone seals on-site. If multiple successive runs are anticipated, then it is recommended to have extra energy absorbers available too.

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 1 1998	CurveX 2 2004	CurveX 2 2006	CurveX 3 2015/2016	CurveX 4 2022
CurveX Oven Data Logger Model	 **CurveX 1** 6 channels			 **CurveX 3 Basic** 4 channels	 **CurveX 4** 8 channels
		 **CurveX 2**	 **CurveX 2**	 **CurveX 3 Standard** 6 channels	*CurveX 4 Pro coming soon*
		+ 6 Channel Add-on			
Connection type	Jack Cable		USB-B cable		USB-C cable
Ideal Finish Analysis Software	Ideal Finish Analysis Software Version 4 Runs on 32 bit systems		Ideal Finish Analysis Software Version 7 Ideal Finish Analysis Software Version 8 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	1 m	1,5 m	3 m	5 m	10,5 m
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 50mm	-	CX2046	CX2040	CX2041	CX2045
		Clamp	-	CX2030			
		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	-	-	-
		Clamp	-	CX2097	-	-	-
Max temp 700 degree °C	Surface Temperature	Clamp	-	-	-	-	-
		Magnet	-	-	-	-	-
		Ring	-	CX2090	CX2091	CX2092	-
Max temp 1000 degree °C	Air Temperature	Clamp	-	-	-	-	-
		Magnet	-	-	-	-	-
		Wire	-	-	CX2094	-	-

Technical Specifications Temperature Probes for CurveX

Probe type:	Thermo couple K, Class 1*
Connector:	K type miniature plug
Material:	Nickel-Aluminum Nickel-Chromium

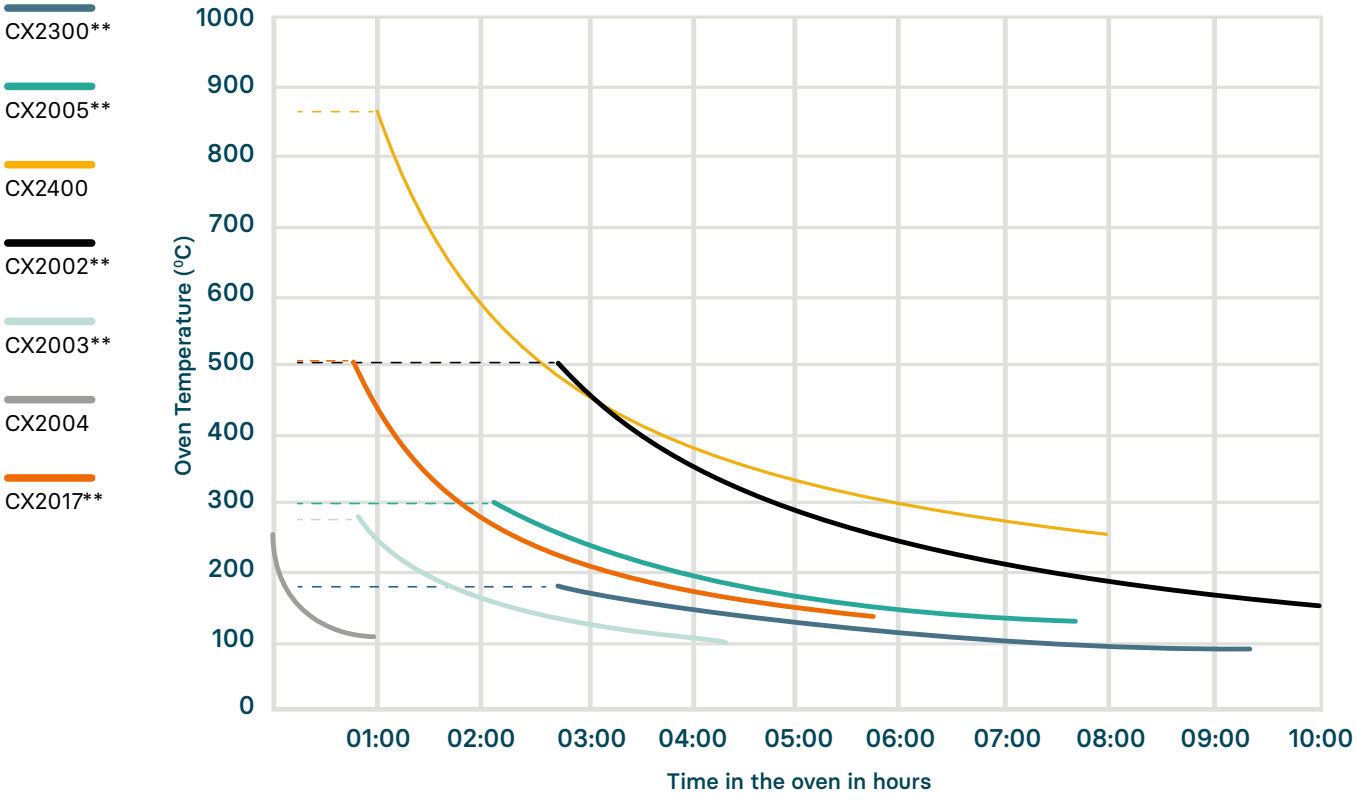
* K Class 1 means -40 °C to +375 °C ±1.5°C and +375 to +1000 °C : ±0.4%

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 aluminum inner box. Inside the aluminum inner box a high density media energy absorber collects any excess of heat and keeps the CurveX logger at an acceptable operating temperature for a long period of time.

Maximum time curves of the insulation boxes, all with energy absorbers



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

Features

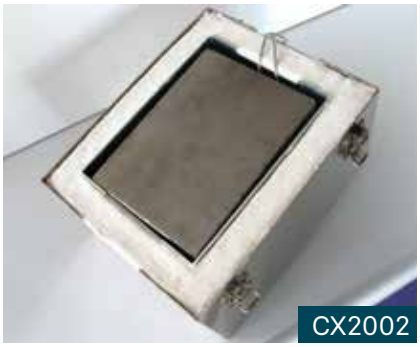
- Excellent logger protection against oven heat
- Ferro plate for holding the magnet probes when not in use
- Mounted cable hook allows the storage of surplus cable length

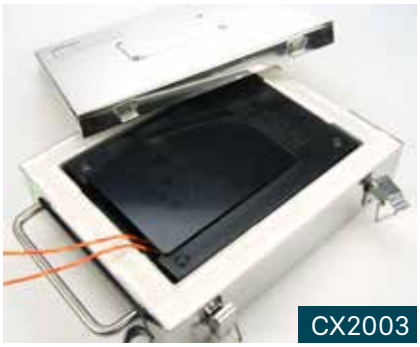
Technical Specifications Insulation Boxes for CurveX

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

Accessories / Spares

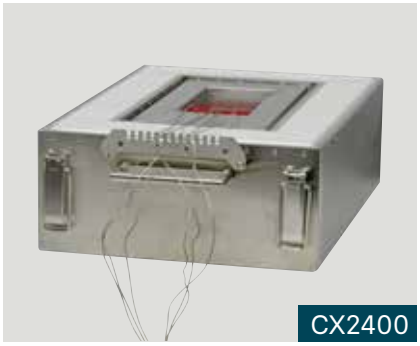
- CX2011: Energy absorber LDPE for insulation box CX2002, CX2017 and CX2005
- CX2012: Extra energy absorber for insulation box CX2002
- CX2013: Energy absorber LDPE Add-on module for insulation box CX2002, CX2017 and 2005
- CX2014: Energy absorber U-shaped for insulation box CX2003


CX2002


CX2003


CX2004


CX2005


CX2400

Ordering Information Insulation Boxes for CurveX

CX2004	**CX2003**	**CX2005**
Dimensions	Dimensions	Dimensions
Depth: 240 mm / 9,45 in	Depth: 255 mm / 10,04 in	Depth: 255 mm / 10,04 in
Width: 105 mm / 4,13 in	Width: 225 mm / 8,86 in	Width: 225 mm / 8,86 in
Height: 50 mm / 1,97 in	Height: 70 mm / 2,76 in	Height: 140 mm / 5,51 in
Approximate Weight: 1,6 kg / 3,5 lbs	Approximate Weight: 2,7 kg / 5,9lbs	Approximate Weight: 4,2 kg / 9,3 lbs
Energy absorber: Included	Energy absorber: CX2014*	Energy absorber: CX2011*
Max Temperature: 300 °C / 572 °F	Max Temperature: 300 °C / 572 °F	Max Temperature: 300 °C / 572 °F
CurveX 3 Basic	CurveX 3 Basic	CurveX 3 Basic, 3 Standard, 4

* To be ordered separately.

Ordering Information for absolute sillicone-free Insulation Boxes for CurveX

CX2300	**CX2017**	**CX2002**	**CX2400**
Dimensions	Dimensions	Dimensions	Dimensions
Depth: 240 mm / 9,45 in	Depth: 240 mm / 9,45 in	Depth: 280 mm / 11,02 in	Depth: 540 mm / 21,3 in
Width: 225 mm / 8,86 in	Width: 225 mm / 8,86 in	Width: 230 mm / 9,06 in	Width: 360 mm / 14,2 in
Height: 140 mm / 5,51 in	Height: 140 mm / 5,51 in	Height: 180mm / 7,09 in	Height: 250 mm / 9,8 in
Approximate Weight: 4,2 kg / 9,3 lbs	Approximate Weight: 4,2 kg / 9,3 lbs	Approximate Weight: 6,9 kg / 15,4 lbs	Approximate Weight: 32 kg** / 70,55 lbs
Energy absorber: CX2011*	Energy absorber: CX2011*	Energy absorber: CX2011*/ CX2012*	Energy absorber: Included CX2405
Max Temperature: 180 °C / 356 °F	Max Temperature: 500 °C / 932 °F	Max Temperature: 500 °C / 932 °F	Max Temperature: 850 °C / 1562 °F
CurveX 3 Basic, 3 Standard, 4	CurveX 3 Basic, 3 Standard, 4	CurveX 3 Basic, 3 Standard, 4	CurveX 3 Basic, 3 Standard, 4

* To be ordered separately.

CurveX 3 Nano

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

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

With the help of paint cure specifications, the CurveX determines the curing process by calculating the cure index for you – enabling a simple pass / fail set-up. On a computer, you can analyze 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 is a four channel thermocouple type K logger and 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. 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 placed over a pin. Once in place, the position on the pin can be quickly fixed with two thumbscrews. The housing at the same time functions as an insulation box, therefor the CurveX 3 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.

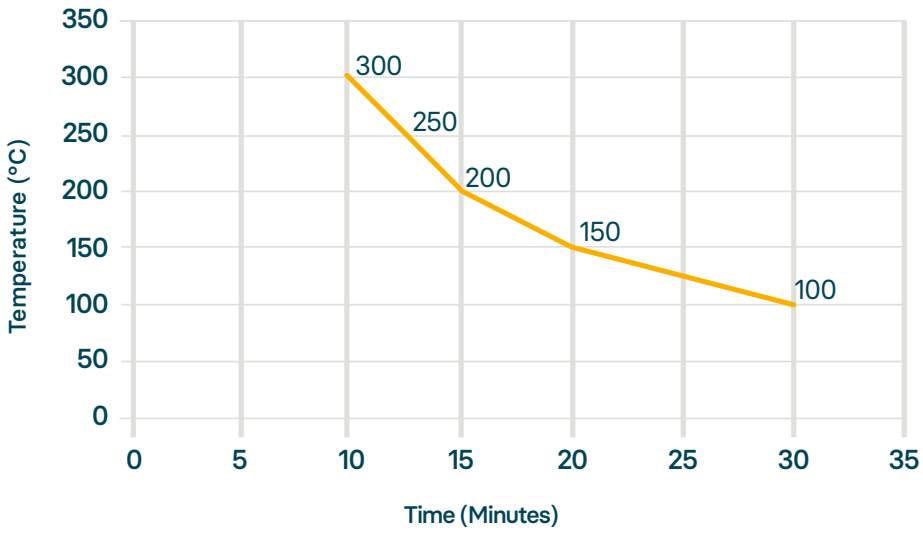
Inside End-caps

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

When painting the inside, the cans are placed in trays that traverse through the first oven. The CurveX 3 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.

CX3040 – Insulation Curve



Endcap for outside coating

Endcap for inside coating

Features

- Operate through only 3 buttons
- Meaningful feedback through multi colored LEDs
- 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
- Tubular 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

- CurveX 3 Nano
- Factory calibrated, calibration certificate included
- Ideal Finish Analysis software download
- USB cable
- Plastic carrying case
- 4x Thermocouple wire probes
- Set of 25 Self-adhesive attachment pads (T=250 °C/482 °F)

Technical Specifications CurveX 3 Nano Logger

Measuring range	0 °C to 300 °C / 32 °F to 572 °F
Operating temp.	0 °C to 60 °C / 32 °F to 140 °F
Max. time in oven	10 minutes at 300 °C / 10 minutes at 572 °F 12 minutes at 250 °C / 10 minutes at 482 °F 15 minutes at 200 °C / 10 minutes at 392 °F 19 minutes at 150 °C / 10 minutes at 302 °F 30 minutes at 100 °C / 10 minutes at 212 °F
Accuracy	± 1 °C / 1,8 °F
Channels	4
Sample interval time	1s to 60 min
Memory	10 batches with 16.000, or 1 batch with 160.000 readings
Display	Three multi-color LEDs
Interface	USB
Housing material	Stainless Steel
Dimensions (D x W x H) Incl. End caps with guide slots	51 x 110 x 210 mm / 2,00 x 4,33 x 8,27 in
Dimensions (Diameter x H) Incl. end caps for inside coating	51 x 210 mm / 2,00 x 8,27 in
Power supply	USB Rechargeable battery
Battery life time	120 hour continuous use

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.

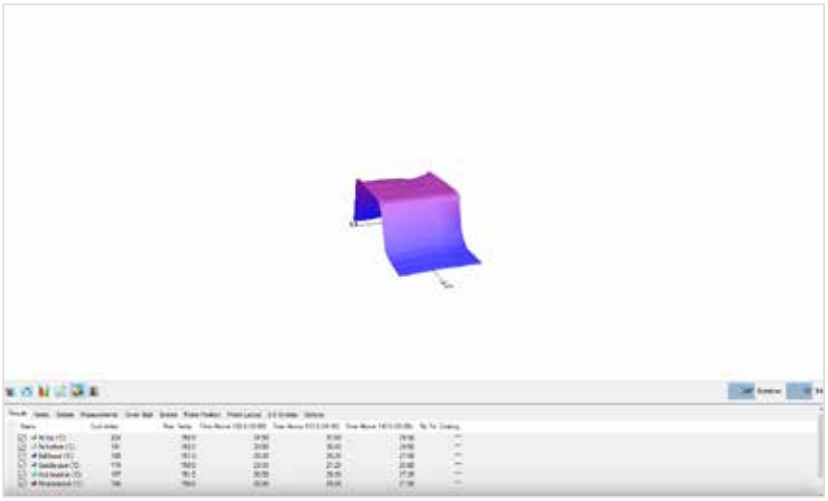
The Ideal Finish Analysis Software is the most advanced coating climate, coating cure and coating thickness monitoring software package available today. With two user levels Ideal Finish Analysis offers user friendly reporting functions for standard production work as well as advanced calculations for 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.

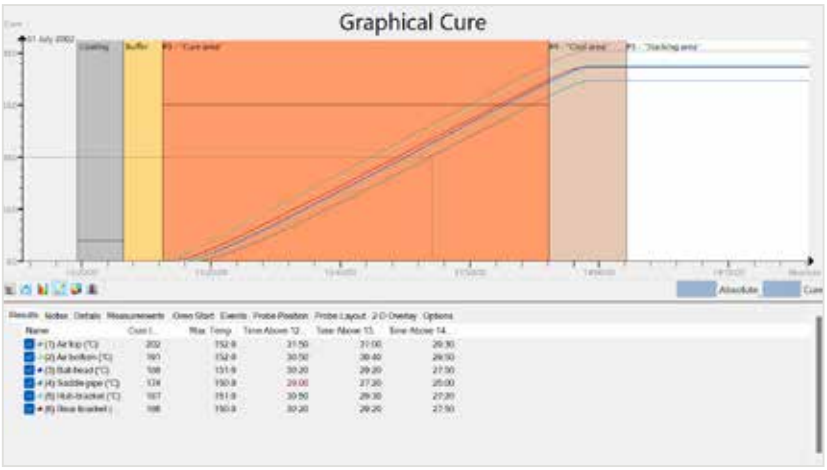
For the CurveX product range, the Ideal Finish Analysis software is a total set-up system, allowing users to modify oven and production conditions.

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 heaters. Users can also set-up different paint types that are in use, as well as the probes probes used and how they are laid out on the product.



3D Temperature Graph

Graphical Cure



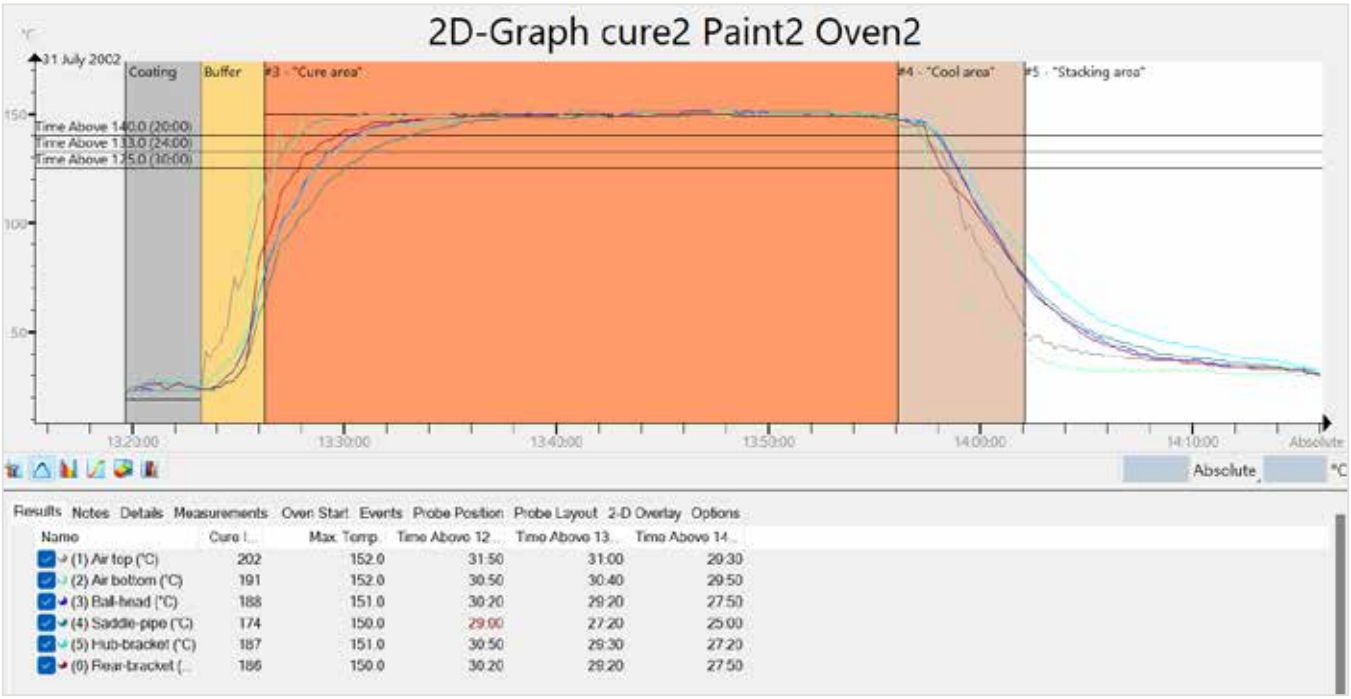
Simulate Paint Changes

Obtaining temperature data is only part of the job. The Ideal Finish Analysis software not only allows you to analyze real oven production results and it also allows users to simulate oven and coating 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.

The information can then be shared with colleagues from different sites across the world, by emailing the created scenarios.



Oven Profile Cure Graph

Reporting

The Ideal Finish Analysis software 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.

Users can implement their company logo, include product images of the product 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 when improving production processes

Allows users to identity optimization opportunities.

No license key required – it is a key component of the CurveX family and other TQC Sheen coating products.

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 manufacturer and distributor of some of the best known and loved kitchen appliances and interiors furnishings in the world. Recently, they experienced a problem with the color match on one of their enamels and needed our help.

The Speedometer of the Oven

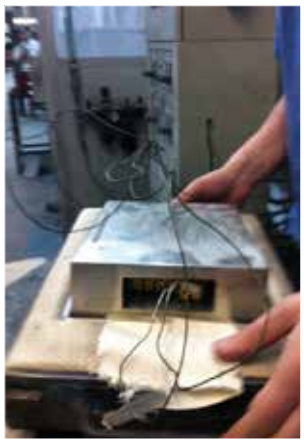
The CurveX system gives the necessary information on the activities inside the furnace. With the information gathered by the CurveX Datalogger combined with Ideal Finish Analysis software, adjustments can be made and money saved.

> " 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 unnoticed 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.

Who are we

Industrial Physics is your global test and measurement partner. And we provide packaging, product, and material integrity testing solutions to manufacturers, production lines, and laboratories across the world. It's our purpose to protect the integrity of our customer's brands and products.

Operating across a family of brands – including TQC Sheen, we've spent almost 100 years providing the highest quality of packaging, product, and material testing solutions for businesses across the world.

At Industrial Physics, we develop instruments for a variety of demands. And we can offer multiple solutions across a diverse range of industries. Utilizing the latest advancements in technology, our instruments test across highly specific applications that will ensure the integrity of your packaging, products, and materials.

As your inspection partner, you'll experience safe, cost-effective, and highly accurate results. But we can also provide a global service offering that puts your needs first including calibration, repairs and maintenance.

What our customers say

" For many years, we have been a user of laboratory equipment under the TQC Sheen brand for coating tests.

Many of our customers appreciate the TQC Sheen brand equipment, because it is world-class apparatus that they know and use in their laboratories. Excellent technical contact, perfect customer service and fast order processing time are undoubtedly additional advantages that determine the choice of TQC Sheen as our permanent supplier of laboratory equipment today and in the future".

Artur Palasz PHD
R&D Director
Spektrochem Paint Laboratory

Get in touch

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

Email: info@industrialphysics.com

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