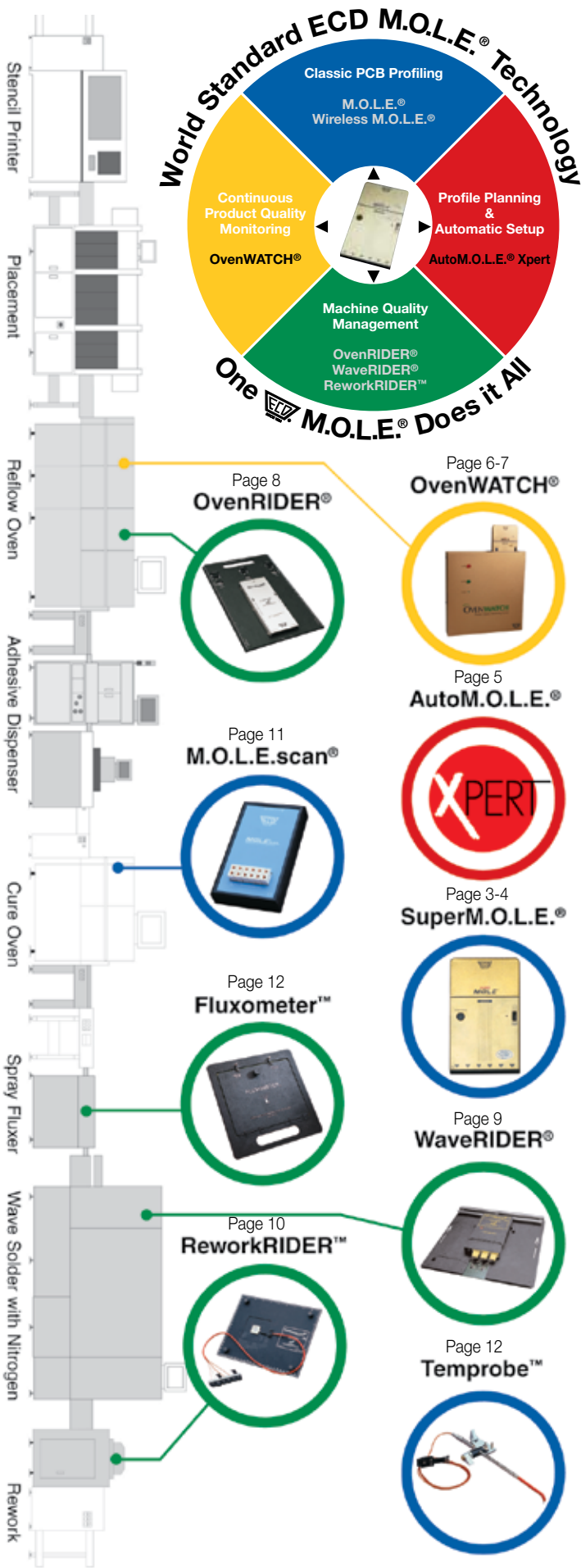


ECD Lead-Free Compatible Profiling Catalog

Super M.O.L.E.[®]





World Standard ECD M.O.L.E.® Technology

Classic PCB Profiling
M.O.L.E.®
Wireless M.O.L.E.®

Profile Planning & Automatic Setup
AutoM.O.L.E.® Xpert

Machine Quality Management
OvenRIDER®
WaveRIDER®
ReworkRIDER™

Continuous Product Quality Monitoring
OvenWATCH®

One ECD M.O.L.E.® Does it All

Stencil Printer

Placement

Reflow Oven

Adhesive Dispenser

Cure Oven

Spray Fluxer

Wave Solder with Nitrogen

Rework

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OvenRIDER®

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OvenWATCH®

Page 5
AutoM.O.L.E.®

Page 11
M.O.L.E.scan®

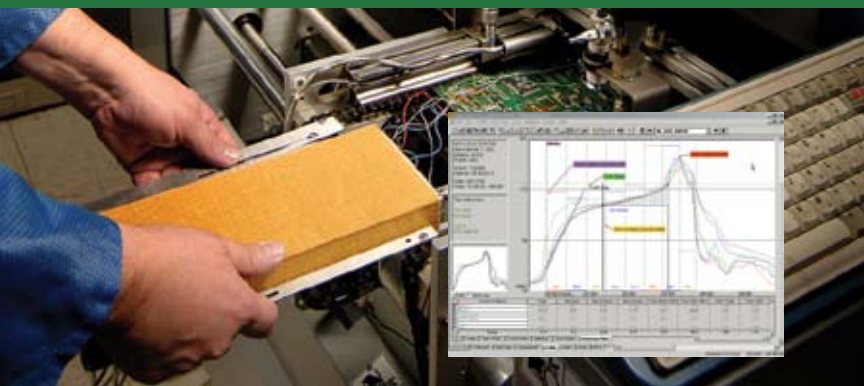
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SuperM.O.L.E.®

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ECD and the SuperM.O.L.E.® Gold

Thermal profiling as an integral activity for soldering process development is well understood. Circuit board profiling alone however, cannot reign in all the variables of the process window. With other thermal profiler providers, all you may get is a thermal profiler; profile the board today; profile the board tomorrow and the next day. ECD's approach is much more comprehensive. The same M.O.L.E. thermal profiler you used to develop the machine recipe today is the same multipurpose M.O.L.E. you continue to use to maintain the performance of your soldering machine tomorrow [our RIDER® pallet products].

Now, ECD, the Lead-Free Profiling Leader, announces the first thermal profiler that is RoHS Compliant. ECD's customers are worldwide, as are yours and this new Super M.O.L.E. Gold shows our commitment to worldwide electronics manufacturing needs & realities. Customers are demanding that lead and the other banned substances in the Initiative not be in your products, so you should expect the same from the quality tool you obtain to profile your products.

Choose ECD for the most versatile thermal profiling product line in the business.

Super M.O.L.E.® Gold Lead-Free

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Lead-Free Compatible

SuperM.O.L.E.® Gold Lead-Free available as complete Deluxe or Wireless RF Profiling Kits with two sets of 6 Glass K-Type Color-Indexed Thermocouples, 1" Uni-Barrier with Yellow Jacket, ECD Software Suite CD, Cables and Gold briefcase

Compatibility:

AutoM.O.L.E. Xpert3
OvenWATCH
OvenRIDER NL
WaveRIDER NL
ReworkRIDER
AeroM.O.L.E.
UV Sensor



Languages:

English, Spanish, French, German, Italian & Japanese are included



Classic Profiling for Lead-Free

Why thermal profiling? There are actually many reasons to profile, as outlined in the IPC-7530 specification – [Guidelines for Temperature Profiling Mass Soldering Processes](#). With lead-free realities upon us, if you don't profile now you certainly will soon. Increased melt temperatures drive the process exceedingly closer to materials limits, severely narrowing the process window. Managing that process through thermal profiling replaces opinions with facts and constitutes a key facet for process development and ongoing quality control. We call this Classic Profiling.

The SuperM.O.L.E. Gold, 1" Uni-Barrier with Yellow Jacket thermal barrier, and glass color-indexed thermocouples enable your lead-free profiling work. The software layers data formatting, downloading and graphing with oven modeling, predictive analysis and statistical process control.

Real-Time Lead-Free Profiling

When you want to see data live, on-screen, the logged data

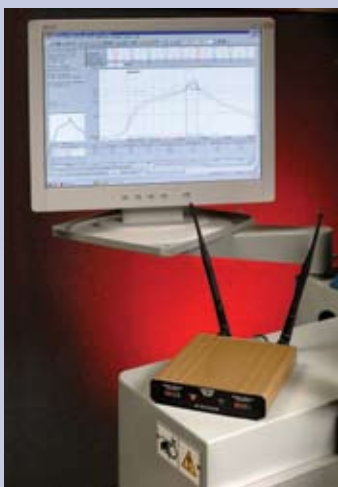
is sent via wireless link with the SuperM.O.L.E. Gold RF System. The modular transmitter plugs between the profiler and powerpack. This combination fits within the 1" Uni-Barrier/Yellow Jacket and sends signals to the computer-connected receiver. The live screen auto-scales as it updates. Programmed alarm messages also appear – useful for lead-free work.

With RF, your analysis is complete as you retrieve the M.O.L.E., speeding you back to production mode. Also beneficial for longer curing processes. For data integrity, transmit test button, dual signal strength meters and 15-step 913 to 920MHz selectable channels maximize reception. FCC-approved broadcast area is 2,090 sq. M [22,500 sq. ft.]; higher gain antennae available]. Data is still saved to the M.O.L.E. memory for subsequent download as well. Trust the profiler used by thousands worldwide every day, SuperM.O.L.E. Gold and RF Lead-Free.

4 Super M.O.L.E.® Gold Wireless Lead-Free

Compatibility:

SuperM.O.L.E. Gold and Xpert-Ready SuperM.O.L.E. Gold



Applications:

- Real-Time Profiling of Temperature, Air Velocity and Ultraviolet Energy
- Analyze while profiling for immediate resumption of manufacturing
- Real-Time Alarms monitor process thresholds

Power Supply:

NiMH powerpack for Transmitter & wall transformer for Receiver

FCC Approved Transmitter:

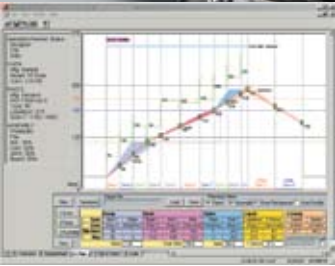
Type accepted per Part 15C

Receiver:

As required by Part 15B

PC Interface:

RS-232 or USB



The AutoM.O.L.E.® Xpert3 Upgrade saves you from the laborious, time consuming iterations of reflow process development that deprive the oven from manufacturing. Instead, work right at your desk to create a robust lead-free process and oven recipe before actually running a profile.

New, flexible oven Signature creation makes Xpert3 compatible with virtually any oven, freeing the program from the confines of

machine, PC and software compatibility. This advanced functionality lifts the process engineer to new levels of productivity – just when you need it most – with your added lead-free transition workload.

Intelligence based upon oven zones, convection rate and conveyor speed, solder paste specification, and assembly properties, Xpert3 automatically manages the process window for you, calculating a robust product profile the oven can execute while satisfying paste and product specifications.

AUTOMOLE XPERT3
plan • set-up • verify

Auto M.O.L.E.® Xpert3

5

Features:

- Plan Robust Reflow Profiles at Your Desk for Any Oven
- Planner Wizard steps you through Oven, Paste and Assembly Properties for a robust profile every time
- Paste Wizard speeds new Lead-Free additions
- Transpose command converts existing profiles to New Oven Recipes
- Reduces new process development time by 60 to 80%



- Includes Desktop Charging Download Station, Calibration Board, software CD, manual and carrying case



Continuous Product Quality Monitoring

The ECD OvenWATCH provides continuous product monitoring with the ability to identify out of control trends so you can correct them before they adversely affect product quality in the reflow process. Systems include a Windows XP PC for autonomous monitoring while running the software with MSDE SQL database. A custom Oven Probe and conveyor speed sensor relate current oven performance

to the baseline profile, creating an overlay that is a prediction based on those conditions. Recall reflow data for Playback by part number, Board In/Out and other search criteria for ISO and customer audit traceability.

Watch SPC monitors performance trends against specification and control limits for continuous SPC charting that also drives the alarms functionality.

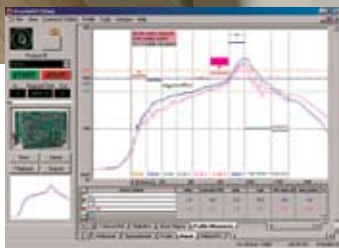
Be secure in the knowledge that you can answer your customers with confidence when you specify the OvenWATCH System.



6 OvenWATCH®

Features:

- Provides board-level traceability of reflow soldering conditions
- Positive part identification by p/n, solder paste, baseline profile, and product photograph
- Automatically display X-Bar R SPC charts so out of control and out of spec conditions can be detected and reported
- Automatically reports any out-of-specification conditions & trends *before* the process is out of control
- Reports alarms by lamp, light tower [optional], e-mail, or pager message
- SPC parameters are: Ramp, Soak, Spike, Peak, Time-Above, Max + Slope and Conveyor
- Includes SuperM.O.L.E. Gold, OvenWATCH Station, Custom Oven Probe, Installation kit, Board In/Out & Conveyor speed sensors, 1" Uni-Barrier with Yellow Jacket, 2 sets of glass thermocouples, Dedicated PC and OvenWATCH SPC Record/Playback Software



OvenWATCH continuously displays the Baseline Profile overlaying a live Dynamic Profile, which is the Prediction of the developed process at current oven conditions. This information is archived for later playback via search criteria while generating Dynamic SPC for alarms notification

OvenWATCH® 7

Compatibility:

Xpert-Ready SuperM.O.L.E.
Gold Profiler [included]

Sensors:

Custom Thermal Probe per
Oven Make & Model, Optical
Board Entry and Exit, Induc-
tive Conveyor Speed

Supplied Computer:

2.66 GHz/533 FSB P4
with 512MB SDRAM,
40 GB IDE Hard Drive,
CDRW drive, Windows
XP, KVM Switch (or better)

Software:

- OvenWATCH® SPC is installed on Supplied Computer
- MSDE SQL Database
- Data Archiving and Playback
- Automatic SPC charting with local and remote alarms notification

Options:

Bar Code Reader, Light
Tower, SMEMA Interface

Lead-Free Compatible



OvenRIDER NL Profiles reflow oven capability, separating zonal temperatures from convection efficiency while verifying conveyor speed for a true picture of oven Lead-Free performance consistency. Ensuring oven capability for Lead-Free recipes is an important task, and OvenRIDER NL is Lead-Free capable itself, with 50% more thermal capacity than the previous model and a low 0.91"/23.1mm clearance height above the chain conveyor.

Powered by SuperM.O.L.E.[®] Gold, ECD's OvenRIDER[®] Reflow Oven Analysis System is THE alternative to profiling "golden boards" for first-off use. Built-In Statistical Process Control makes OvenRIDER a superior

Zone Temperatures plotted with Heat Flow in a 10-zone oven

quality assurance tool, and there are no thermocouples to attach. The patented OvenRIDER utilizes a combination of thermal and position sensors to measure oven performance, delivering consistent color-coded data that can be used to identify trends [SPC implementation] and serves as a Go/No-Go indicator for the operator.

OVENRIDER[®] NL

8 OvenRIDER[®] NL

Features:

- Lead-Free Process Compatible
- Profiles reflow oven capability for Lead-Free recipes
- Regular 1st-Off use provides SPC charting control, CP and Cpk indices
- Separates zone temperatures from convection efficiency while verifying conveyor speed
- 7 minutes @ 300C M.O.L.E.[®] Protection
- Includes OvenRIDER pallet with sensors, Magnets Kit, software CD and carry case
- Dimensions:
 - Standard Widths: 167, 305 & 458mm [6.6, 12 & 18"]
 - Custom widths > 167mm [6.6"] available
- 23.1mm [0.91"] height above chain
- 8.7mm [0.34"] depth below chain





WaveRIDER Data Parameters Go/No-Go Screen

Wave soldering is one of the most challenging automated soldering procedures to set up. Especially after preventive maintenance, running the WaveRIDER is like using an electronic glass plate that captures the machine's signature, providing you with saved data that the old method never could.

Managing through-hole and mixed technology wave soldering quality and repeatability is even more challenging in the Lead-Free realm, and the new WaveRIDER

NL is Lead-Free capable itself, with 30% more thermal capacity than the previous model and a polyimide test coupon so there is no lead contamination potential. Dedicating an NL pallet for profiling your Lead-Free lines ensures no cross-contamination from the lead alloy solder pots.

The patented WaveRIDER NL ensures soldering repeatability, time after time, and provides SPC data to the Engineer and Go/No-Go indication for the operator.

WAVE RIDER[®] NL

WaveRIDER[®] NL 9

Features:

- Lead-Free Process Compatible
- Profiles your wave solder machine without attaching thermocouples
- Ensures higher Lead-Free pot and preheat temperatures and ramp are maintained
- Regular 1st-Off use provides SPC charting control, CP and Cpk indices
- Measures ramps, temperatures, parallelism & wave height while verifying conveyor speed

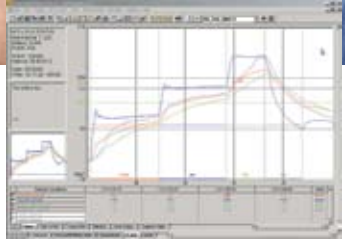


- Includes WaveRIDER pallet with polyimide Test Coupon, software CD and Carry case
- Dimensions:
Standard Widths: 228, 305 & 381mm [9, 12 & 15"]
Height: 31.7mm [1.25"]
Length: 305mm [12.0"]



As more and more assemblies are manufactured with lead-free components, board finishes solder alloys and combinations thereof, controlling your changing rework profiles is critical. More than ever, it makes sense to elevate Rework Station quality control levels to those of your wave and reflow soldering processes.

For current SuperM.O.L.E.®, M.O.L.E.scan® and other profiler users, ReworkRIDER features the patented Wiz™ dual-sided nozzle probe providing a stable BGA emulation test vehicle from which to measure nozzle height, air flow and temperature variation in the rework cycle. Adjacent to the Wiz



sensor is a top and bottom side air temperature sensor.

ReworkRIDER SPC tracks 12 parameters both top and bottom-side, per zone for the utmost in standardization and repeatability data.

The kit includes the ReworkRIDER pallet with Wiz and air sensors, 4 standard Mini connectors, Mini to Micro adapter set, ReworkRIDER SPC software and carry case.

10 ReworkRIDER™

Features:

- Measure Top and Bottom Side Wiz & Air Temperatures
- Determine Process Capability and verify rework process consistency amongst all stations
- Integrates with M.O.L.E.scan and other Profilers
- Profiles Convection, Laser and IR Rework Stations
- Includes ReworkRIDER pallet with sensors, Mini to Micro Adapter Set, software CD and carry case with space for M.O.L.E.scan
- ReworkRIDER SPC software is compatible with SuperM.O.L.E.® Gold and M.O.L.E.scan® only

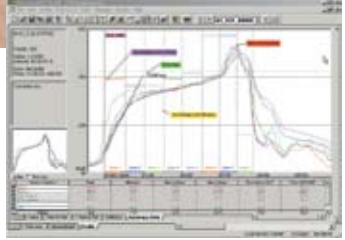




The easy-to-use trailing thermocouple profiling system for reflow, wave and rework soldering M.O.L.E.scan® is the newest member of ECD's family of classic profiling tools for soldering applications. Just plug it into your PC, load the software and you're off and running. No batteries are required – M.O.L.E.scan is powered from your computer.

M.O.L.E.scan is specifically designed to bring high end profiling capabilities to reflow ovens and rework stations, old or new. M.O.L.E.scan is designed to remain stationary while feed-through thermocouples are employed to conduct a classic profile.

We didn't scrimp on the software either. M.O.L.E.scan displays time/temperature data in



M.O.L.E.scan® Profile View

real-time, at a 0.2 second rate. Our solder paste database is included. Zone modeling is here, as is Dynamic Prediction for instant what-if analysis. In fact, all the powerful analysis tools of our full-featured profilers are included such as Zoom, Peak Difference, Overlay, 3D, Measure, Notes, and Tolerance Band.

M.O.L.E.scan®

M.O.L.E.scan® 11

Features:

- A stationary profiler designed to use feed-and-retrieve thermocouples
- Real-Time Data Capture; M.O.L.E. file compatibility
- Powered from the RS-232 or USB port
- Includes real-time Data Relay with 6 K-Type Mini thermocouple inputs, M.O.L.E.scan software CD, USB & RS-232 cables

Thermocouples sold separately



Fluxometer™

Spray Flux Uniformity Measurement System

Take control of your spray flux process with the ECD Fluxometer, the first easy-to-use spray flux process monitor available. The Fluxometer is so convenient and accurate, operators can perform diagnostic checks in just minutes.

- Run the Fluxometer through your spray fluxer just like a circuit board
- Remove the special test paper from the test mesh and analyze the topside board penetration and uniformity of flux application

Spray fluxer performance is critical to a robust wave solder process. Now you can make accurate machine adjustments that optimize this process.



Temprobe™

Temprobe is a precision-built sensor that accurately measures component temperatures without soldering, taping or gluing. The subminiature, sealed thermocouple tip of the Temprobe can be placed anywhere on a component, lead or substrate. Temprobe is used in place of a conventional thermocouple to monitor the temperature of critical solder joints or components and is great for Ball Grid Array profiling too. Temprobe is compatible with all thermal profilers.

Oftentimes, contract assembly manufacturers do not receive an 'extra' board for process setup. Temprobe is the solution since it is solderless and non-invasive. Simply Clip, Position and Profile. Afterwards, detach from the board edge, with no detrimental effects to the test article.



12 Fluxometer™ & Temprobe™

Maximize Process Control

The ECD Fluxometer provides easy and rapid qualification of the spray flux topside board penetration and uniformity

- Eliminate spray fluxer adjustment guesswork
- Reduce rework and scrap
- Lower manufacturing costs
- Improve the spray flux process
- Improve the wave soldering process
- Optimize overall flux usage

Quality, Precision, Function

- The fast and repeatable way to attach thermocouples – without soldering
- Profile any board in the lot – great for Contract Manufacturers
- Produce reliable profiles. High contact pressure and low thermal mass give fast, reliable response
- Monitor temperature anywhere. Small, durable thermocouple tip fits into tight places

UV Sensor

The UV Profile Sensor enables the measurement of intensity and dosage for ultraviolet curing processes with the SuperM.O.L.E. Gold and ECD's latest software. Simply tell the program which channel(s) have the UV sensor plugged in, select sampling parameters and you're ready to run.

- Profiles UV Intensity and Total Exposure
- Multiple sensors can be used for 3-D profiling
- May be used in combination with thermocouples
- Also compatible with SuperM.O.L.E. Gold RF

Applications

ECD's UV Sensor is intended for application in processes that use ultraviolet radiation as the energy source, particularly for curing UV finishes and conformal coatings. When channels are selected for the UV Sensor, the graph displays Intensity in mW/sq. inch or cm, and total exposure [Dosage] in Joules over a user-

AeroM.O.L.E.®

The AeroM.O.L.E. air velocity profiler provides the means to adjust and maintain convection fan speeds and oven baffle settings thus avoiding the trial-and-error method of oven balancing. Use AeroM.O.L.E. with a SuperM.O.L.E. Gold RF during maintenance so you can view adjustments in real-time as jog the conveyor.

Application

The AeroM.O.L.E. is commonly used to determine the highest convection fan settings without blowing tiny SMT components off the board or mislocating them before they are soldered.

User Friendly

Now you can profile air velocity levels as easily as you profile temperatures. Profile three channels of air velocity horizontally or vertically from 0-17.82 m/s [0-3,500 fpm], utilizing your SuperM.O.L.E. and ECD profiling software.

UV Sensor & AeroM.O.L.E.® 13

Display/Readout:

For use with ECD
SuperM.O.L.E. profilers

Spectral sensitivity:

Approximately 230-430 nm

Intensity Range:

0-5 Watts

UV Sensor:

Solid-state construction;
chrome-plated steel

Dimensions:

Diameter 76mm [3"]



Display/Readout:

For use with ECD
SuperM.O.L.E. profilers

Range:

0-17.82 m/s [0-3500FPM]

Operating Temperature:

10°-50°C [50°-122°F]

Resolution:

1 FPM (0.005 m/s)



Side Rider™

The Side Rider provides a secure profiler platform for small tunnel beltless reflow ovens. It functions as an adjustable-width profiler carrier that also cradles the M.O.L.E. and thermal barrier 9.5mm [.374"] below the level of the conveyor chain, providing that additional height clearance. Width expands up to 343mm [13.5"] with one outrigger.

This eliminates two large problems for rail-only ovens with tight tunnel space; the profiler will not get stuck in the tunnel and it is impossible for the profiler to fall from the Side Rider and be damaged in the oven.

A Side Rider kit includes 140mm [5.5"] and 165mm [6.5"] cradling trays, a 3rd 140mm [5.5"] flat tray for ovens with a center rail support, one outrigger scissors-action extension and a carry pouch. The Side Rider is ruggedly designed with stainless steel for long life.

M.O.L.E.® Chiller

The M.O.L.E. Chiller enables your next profile in half the time with its active cool-air convection. It is important not to exceed thermal barrier time/temperature ratings by always beginning with a room temperature profiler and barrier [or OvenRIDER®/Wave-RIDER®/ReworkRIDER™]. M.O.L.E. Chiller speeds you to the next profile, making you more productive.

The M.O.L.E. Chiller is Beneficial For:

- Multiple profile passes during process development
- Subsequent verification pass to a First-Off correction
- Process Capability data collection for SPC implementation
- M.O.L.E.® sharing across multiple production lines

M.O.L.E.® CHILLER

14 Accessories

Feature:

- Profiler carrier for low clearance ovens
- Includes 3 trays, one outrigger and rugged carry pouch
- No tools required for adjustment, 2nd outrigger optional



Feature:

- Cools the M.O.L.E.® and other profiling tools in half the time
- All in a mere 120mm [4.75"] footprint
- Available in 120 and 230VAC Models, 50/60Hz



Thermal Barriers

The 1" Uni-Barrier with Yellow Jacket is the standard barrier in all our Lead-Free profiling kits, including the wireless RF kit. A thermal barrier is the protection the SuperM.O.L.E. needs to ensure longevity through harsh environments. With piano-hinged stainless steel construction, sheathed in cool-to-the-touch high-temperature fabric, this barrier is rated for 17 minutes at 300C steady state ambient, ideal for lead-free reflow and wave soldering work.

This Barrier combination is light-weight and thin (32.5mm [1.28"]). Conveyed with Side Rider, only 23mm [.907"] of above-chain clearance is required – great for low clearance ovens. Plus it cools quickly while keeping your M.O.L.E. cool inside.

For profiling overhead conveyors or longer and much hotter applications, simply contact ECD and we will match a thermal barrier to your time/temperature and space/size requirements.

Thermocouple Sensors

To withstand the rigors of Lead-Free profiling, standard ECD kit thermocouples now feature glass insulation for a 482C [900F] rating. Our standard 3-foot [915mm] length thermocouple sets match the color-indexing of the SuperM.O.L.E. Gold right through to the software, so you can instantly tell what channel every instrumented component maps to.

Glass insulation is available in both 36 gauge [.127mm/.005" diameter] and 30 gauge [.254mm/.010" diameter] with micro style connector. PFA insulation remains available in both gauges in both micro and miniature connector styles. PFA style is rated for 260C [500F] maximum. Packages of 6 color-indexed thermocouples include an index label for your M.O.L.E., a sample of high temperature solder, strips of aluminum and Kapton tape and an organizer sleeve.

ECD specifies special limits of error grade thermocouples for $\pm 1^{\circ}\text{C}$ sensor accuracy.

Accessories 15



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Specifications subject to change