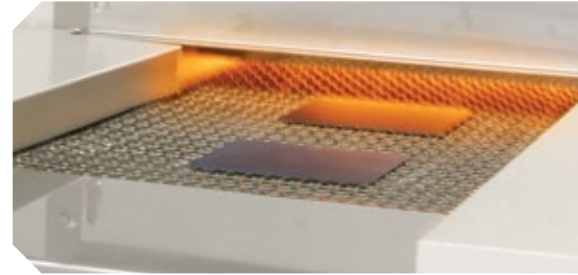


◆ CF and CDF Series Infrared Firing and Drying/Firing Furnaces

New standard features and options



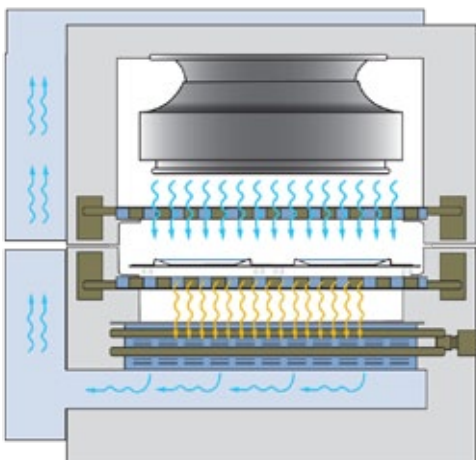
BELT SPEED RANGE

- ◆ Belt speed range of 26-300 ipm (66-762 cm/min) with proven stability
- ◆ Greater flexibility for a wide range of process profiles
- ◆ The single lane unit is capable of processing up to 2500 wafers per hour and the dual lane can process up to 5000 wafers per hour (dependent on solvent load)
- ◆ Single belt through entire process provides stable, reliable conveyance

HYBRID COOLING SECTION

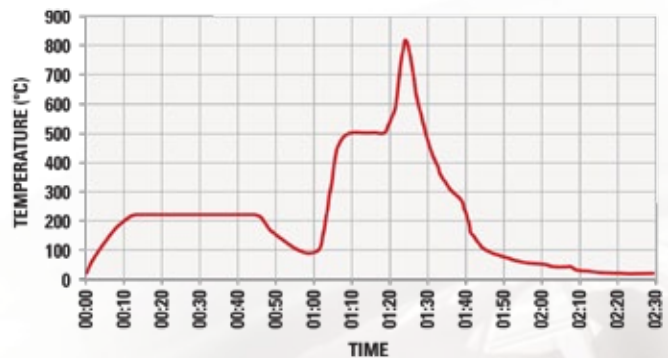
The cooling section in the CF Series has been updated to a combined radiant and convection cooling system that allows the flexibility to rapidly cool cells as required for specific processes.

- ◆ Radiant /convection design for high thermal transfer rates
- ◆ Top to bottom flow “furnace neutral” close coupled without influencing firing profile
- ◆ Gentle distributed airflow to prevent wafer movement
- ◆ Unique design with all connections outside the process chamber eliminates any possibility of leaks
- ◆ Effective with as low as 1 gpm (3.8L) water flow
- ◆ Flexibility in cooling rates and profile



RAPID RAMP RATES

- ◆ Heating and cooling rates up to 200 deg-C/sec for minimum time above 660°C
- ◆ Ideal for next generation pastes and cell architectures
- ◆ Greater range of process conditions



MESH BELT WITH WELDED STAND-OFFS

The mesh belt includes low mass, inverted “V” stand-offs that support 125/156mm wafers above the mesh belt. This belt provides the ability to achieve higher heating and cooling rates. (Contact factory for stand-off pattern and dimensions)

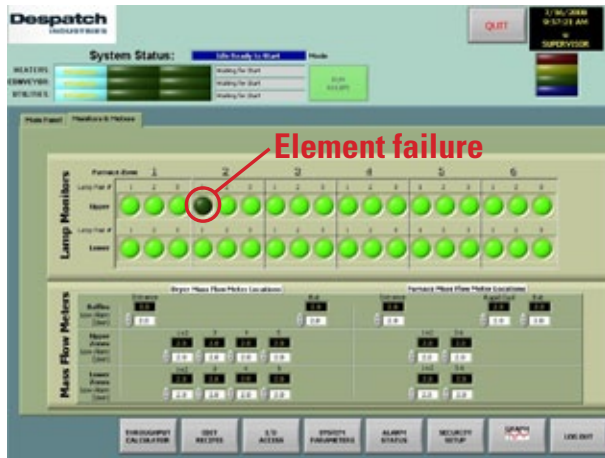
- ◆ Stand-offs allow for fastest heating and cooling ramp rates
- ◆ Improved aesthetics
- ◆ Dual lane version includes two rows of stand-offs and has a 210mm standard center-to-center wafer spacing



ELEMENT FAILURE MONITOR

This feature provides electronic circuitry and software to sense failed heating element pairs in the firing section.

- ◆ Simple PC board design is easy to follow and troubleshoot
- ◆ Feedback on failed heater bulbs through the GUI software for easy visual indication of failed bulbs
- ◆ Reduced MTTR (Mean-Time-to-Repair)



DUAL LANE EDGE HEATERS

Four independently controlled edge heaters to ensure the dual-lane achieves industry leading lane-to-lane temperature uniformity of $\pm 3^{\circ}\text{C}$. Provides tight control of lane-to-lane conditions. (available on dual lane model only.)

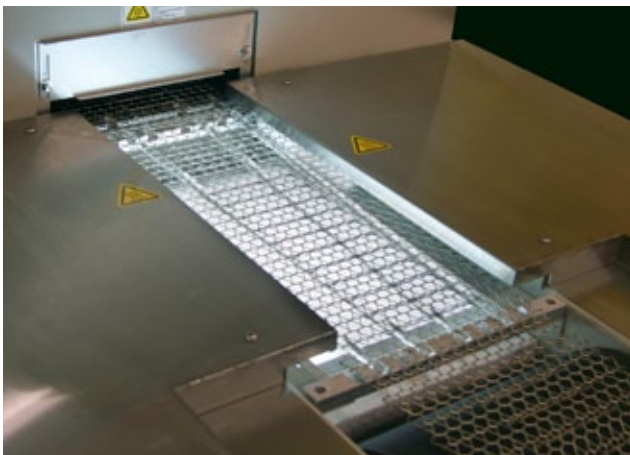


FLAT PANEL TOUCH SCREEN CONTROL PC WITH UPS AND DROP-DOWN KEYBOARD/MOUSE

- ◆ Low profile PC and keyboard minimize footprint and touch screen allows simple commands to be carried out quickly
- ◆ An integrated uninterruptible power supply (UPS) in the flat panel PC keeps the control system operational for 15 minutes following a power outage

PRINTER INTEGRATION PACKAGE

- ◆ An automation light source is provided for pick and place material handling equipment
- ◆ An analog belt synchronization signal is provided for matching load/unload belt speeds
- ◆ A ready, not-ready signal is provided to communicate to upstream/downstream equipment when the furnace is available
- ◆ Cut out on exit table for pick and place equipment



OPTIONS

SOLECTFIRE™ TECHNOLOGY

The CF-Series is available with Despatch's new SolectFire™ option. SolectFire™ is a critical advancement because it opens the process window and gives the operator unique independent open and closed loop control of the top and bottom of each firing zone. Operators have the ability to optimize the firing of the top and bottom of the cell to the silver side and the aluminum side independently, without compromise to either. This innovative decoupling technology provides greater thermal control and sets the stage for high efficiency cell production.

- ◆ Improvements of 0.1% (Contact Despatch for full benefits in mass production)
- ◆ Ideal for new paste and cell architecture investigation



VOC OXIDIZER

A VOC Oxidizer can be provided and will be included on both the entrance and exit end of the dryer section.

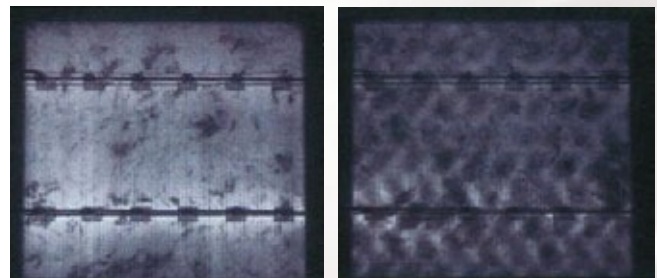
- ◆ Proven localized destruction of VOC contaminants present in the dryer exhaust
- ◆ Point of generation abatement eliminates condensation and/or dripping of solvents onto wafers or in the house exhaust lines
- ◆ Eliminates the need for connection of the dryer to a house pollution control system
- ◆ Best in class (99% or better) destruction of VOCs, odors, HAP's and particulates
- ◆ Cleaner chamber environment and process
- ◆ Decreases downtime and maintenance



EDGE-CONTACT BELT

This conveyor belt features edge contact supports positioned above the mesh belt. Any belt contact occurs on the non-active area of the wafer. This option provides the ability to achieve the highest heating and cooling rates. (Contact factory for stand-off pattern and dimensions)

- ◆ No marks on rear aluminum and improved aesthetics
- ◆ Reduced thermal transfer
- ◆ Reduced recombination
- ◆ Eliminates contamination risk
- ◆ Reduced wafer exit temperature
- ◆ Better firing homogeneity (contacting)
- ◆ Reduced series /contact resistance



Electroluminescence image of wafer fired on an edge contact belt (on the left) compared to a wafer fired on a traditional belt (on the right).

ADDITIONAL DRYER ZONE

This feature adds a fourth 36" long drying zone to the drying section. The overall heated length of the dryer is increased from 108" to 144".

- ◆ Increases the time a wafer will be in the dryer section to ensure full solvent removal. At belt speed of 200ipm (5080 mm/min) this is approximately 11 seconds of additional drying time.
- ◆ Ideal option for F-B-B sequence, or for use with thicker paste(s) that require more drying residence time

WATER COOLED HEAT EXCHANGER

A cooling coil assembly enclosure will be located under the forced air cooling section. The assembly will include inlet/outlet ducting for the forced air recirculation through the water cooled heat exchanger and cooling water plumbing. A flow control gauge is provided.

- ◆ Reduces the amount of exhaust gas required for the overall furnace
- ◆ Reduces the amount of heat exhausted to the room environment
- ◆ Will reduce the overall wafer temperature if cooling water less than 18°C is provided



ULTRASONIC BELT CLEANER

This feature adds an ultrasonic tank and timer system to provide automatic cleaning and drying of the belt during PM cycles. The ultrasonic belt cleaner requires De-ionized (DI) water to be plumbed to the ultrasonic tank. An automated fill and drain cycle is provided at 30ipm (762mm) for the most efficient cleaning. Volume of DI water is approximately 90 liters for single lane and 120 liters for dual lane.

- ◆ Non-contact and non-abrasive cleaning of the belt for longer life expectancy
- ◆ Reduces build up of contaminants when utilized in a regular maintenance cycle
- ◆ Automated water cycle minimizes operator contact
- ◆ Air knife reduces water build up



59-INCH (1.5 METER) FURNACE EXIT CONVEYOR WITH MUFFIN FANS OVER EXIT

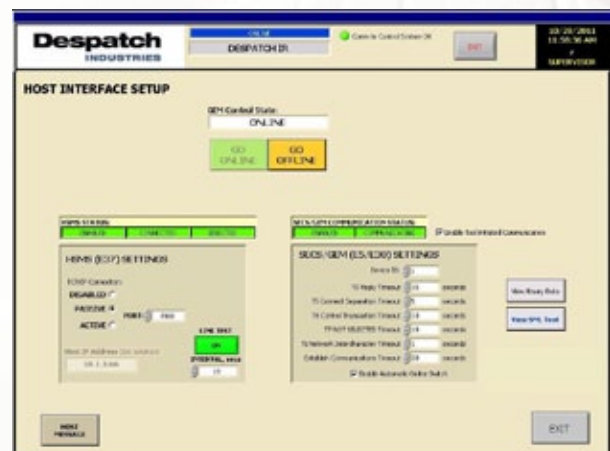
This option is available for customers who require very low exit temperature wafers. The exit end of the furnace is extended to a total of 59-in (1.5 meters). This feature also includes a total of 8 muffin fans mounted on the exit conveyor of the furnace. The two banks require a total space of 23-in (58.4 cm) from the exit face. This feature will reduce the wafer temperature by approximately 10-12°C when operating at a belt speed of up to 250in/min (635 cm/min).

- ◆ Provides lowest exit wafer temperature when combined with Water Cooled Heat Exchanger and either standoff or edge contact conveyor belt

DESPATCH STANDARD SECS-GEM COMMUNICATION INTERFACE

A separate SECS-GEM PC is included with this option that provides partial GEM (SEMI E30) compliance, with HSMS-SS (SEMI E37.1) communication in providing a SECS-GEM communication protocol between Despatch's furnace and the Buyer's MES.

- ◆ The exact level of GEM compliance is to be specified by Despatch prior to the MES FAT procedure
- ◆ If the Buyer has a detailed SECS-GEM specification (e.g., if data spooling, wafer tracking, any level of remote control, heartbeat, etc. are required), Despatch can quote a custom, upgraded SECS-GEM option upon request



CE COMPLIANCE

This option is for the design and manufacture of the furnace evaluated to the requirements of the Machinery Directive (2006/42/EC) and the Electromagnetic Compatibility (EMC) Directive (2004/108/EC). Despatch offers self compliance to the Directives and the applicable harmonized standards, as we interpret them. This option includes a CE Declaration of Conformity, and, for EU countries only, a CD Rom version of the operating manual in the language of the EU installation country.

- ◆ Meet minimum safety requirements as outlined by CE
- ◆ Operations manual translated to the appropriate European language for ease in operation
- ◆ Ferrules can be included as a special option

TEMPERATURE PROFILING KIT

This feature provides software, traveling data logger and hardware accessories required to generate wafer temperature profiling in real time. The temperature profiling kit is available with spring-loaded T/C and a SST profiling wafer. The profiling system includes the following:

- ◆ Data logger and software
- ◆ Insulated thermal barrier enclosure
- ◆ Built-in, rechargeable NiMH battery with charger
- ◆ Three sheathed spring-loaded T/C's and one long-lasting, low mass SST profiling wafer. Standard 156mm wafer provided, but 125mm available upon request. *Note: the spring-loaded T/C and SST profile wafer will not provide the exact same profile due to their differing thermal characteristics.



TEMPERATURE MONITORING PORTS (DL)

Two thermocouples are added to each zone, directly above each lane to monitor the temperature in each zone and provide HMI feedback. Data is then relayed to the GUI to monitor the temperatures across the chamber width in each heating zone.

- ◆ On screen comparison of thermocouple temperatures across the belt
- ◆ High and low-limit alarms will indicate when out of tolerance



DRITECH DRYER

The new Despatch DriTech Dryer integrates seamlessly with CF Series firing furnaces and replaces the current CF Series Dryer. The DriTech™ is designed to decouple the VOC removal and binder burn-off for a more efficient drying process. A centrally located point-of-generation thermal oxidizer provides maintenance-free VOC abatement, ensuring that the chamber remains free of contaminants. Airflow is managed to reduce cold air entrainment at the entrance and exit. A rapid peak temperature and internal management of the insulation surface temperature minimizes condensation. A common belt is shared between the CF Series and the DriTech™ to minimize wafer handling issues.

The DriTech™ Dryer is designed for a fast peak thermal profile that delivers lower wafer exit temperature and maximum VOC release at an early stage for maximum paste drying efficiency. The dryer has the flexibility to effectively dry a wide range of difficult to dry pastes.

- ◆ Significantly smaller footprint
- ◆ DriTech™ maintains separate HMI and power drop

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