

◆ **DCF Integrated, In-line Diffusion System**  
**Phosphorus doping and diffusion for the industry's most uniform emitters**



Despatch's Integrated, In-line Diffusion System was designed to meet the advanced needs of today's solar cell manufacturers. The DCF System offers manufacturers an in-line doper that features simultaneous top and bottom phosphorus coating, an infrared furnace design that provides tight temperature uniformity and a fully comprehensive software system.

This combination of innovative technologies and design delivers manufacturers highly consistent and repeatable phosphorus diffusion results and enables manufacturers to increase cell efficiencies, maximize manufacturing yield and reduce the cost of ownership.

**FEATURES AT A GLANCE**

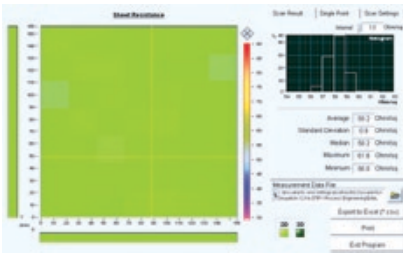
- ◆ High volume production
- ◆ Simultaneous top and bottom wafer coating
- ◆ Closed loop temperature controls
- ◆ Advanced graphical user interface
- ◆ Safe, simple chamber accessibility
- ◆ High production up-time
- ◆ Ease of maintenance

**OPTIONS**

- ◆ Water-cooled heat exchanger
- ◆ Failed element monitor
- ◆ Master production control interface
- ◆ Profiling systems
- ◆ Ultrasonic belt cleaner/dryer
- ◆ Uninterruptible power supply
- ◆ Extended process profiles
- ◆ Conveyor table extensions
- ◆ Wafer loading options:
  - Buffering tool
  - Direct connection to in-line texturing tool and/or PSG glass removal tools
  - Manual load
- ◆ CE Compliance

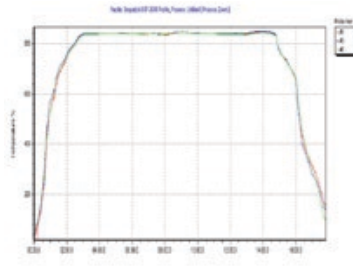


**High ohm emitter capability**  
**Industry best emitter uniformity**  
**Best-in-class uptime and yield**



## IN-LINE PHOSPHORUS DOPING

- ◆ Simultaneous top and bottom phosphorus coating
- ◆ Dopant chamber environmental control
- ◆ Direct connect dopant facility supply connection
- ◆ Variable speed control
- ◆ Adjustable phosphorus application



## IN-LINE DIFFUSION FURNACE

- ◆ Tight temperature control for maximum process window
- ◆ Maximum up-time for higher yields
- ◆ Process profiles for high efficiency solar cells



## INTEGRATED PROCESS CONTROL SYSTEM

- ◆ Doper/Furnace recipe creation
- ◆ Process window monitoring with audible and visual alarming
- ◆ Real-time process window display
- ◆ Data logging
- ◆ Process repeatability

	DCF 400 R&D SCALE	DCF 1000 PILOT/ PRODUCTION SCALE	DCF 3615 PRODUCTION SCALE	DCF 3630 PRODUCTION SCALE	DCF 3640 PRODUCTION SCALE
<b>PRODUCT CONFIGURATION</b>					
System size (length x width x height)	8,805 × 1,310 × 1,750 mm (347 x 52 x 69 inches)	9,625 × 1,310 × 1,750 mm (379 x 52 x 69 inches)	11,633 × 1,870 × 1,750 mm (458 x 74 x 69 inches)	17,940 × 1,870 × 1,750 mm (707 x 74 x 69 inches)	20,150 × 1,870 × 1,750 mm (793 x 74 x 69 inches)
Standard entrance table	457 mm (18 inch)	457 mm (18 inch)	914 mm (36 inch)	914 mm (36 inch)	914 mm (36 inch)
Heated length	3,658 mm (144 inch)	4,572 mm (180 inch)	5,486 mm (216 inch)	10,516 mm (414 inch)	12,344 mm (486 inch)
Cooling length	914 mm (36 inch)	914 mm (36 inch)	1,372 mm (54 inch)	1,829 mm (72 inch)	2,286 mm (90 inch)
Standard exit table	457 mm (18 inch)	457 mm (18 inch)	914 mm (36 inch)	914 mm (36 inch)	914 mm (36 inch)
Conveyor type: Doper	Stainless steel and o-rings (all models)				
Conveyor type: Furnace	Lightweight balance spiral weave, Nichrome V material (all models)				
Conveyor height above floor	97.8 cm ± 3.8 cm (38.5 in ± 1.5 in) all models				
Product clearance	0.25 inch (6.4 mm)	0.25 inch (6.4 mm)	0.25 inch (6.4 mm)	0.25 inch (6.4 mm)	0.25 inch (6.4 mm)
Number of Lanes (156 x 156 mm)	1	2	5	5	5
Conveyor width	254 mm (10 inch)	356 mm (14 inch)	914 mm (36 inch)	914 mm (36 inch)	914 mm (36 inch)
<b>PROCESS CAPABILITIES</b>					
Maximum temperature	1000 °C (1832 °F)	1000 °C (1832 °F)	1000 °C (1832 °F)	1000 °C (1832 °F)	1000 °C (1832 °F)
Approx. throughput (156 x 156 mm)	R&D scale	200-250 wafers/hr	550-750 wafers/hr	1200-1400 wafers/hr	1350-1550 wafers/hr
Conveyor speed range	5-51 cm/min (2-20 ipm)	5-51 cm/min (2-20 ipm)	10-100 cm/min (4-40 ipm)	10-100 cm/min (4-40 ipm)	10-100 cm/min (4-40 ipm)
Conveyor speed accuracy	± 0.5%	± 0.5%	± 0.5%	± 0.5%	± 0.5%
Conveyor speed control	Closed loop feedback	Closed loop feedback	Closed loop feedback	Closed loop feedback	Closed loop feedback
Wafer size	All models - 100x100, 125x125, 156x156 mm (4, 5, 6 inch) <i>Option for 210 x 210 mm (8 inch) support</i>				
Sheet resistance	40 to >80 ohm/sq configurable	40 to >80 ohm/sq configurable	40 to >80 ohm/sq configurable	40 to >80 ohm/sq configurable	40 to >80 ohm/sq configurable

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