

# The Gradient Dryer

## Surface Tension Gradient Dryer

### PRODUCT NOTE

#### Main Benefits

- No watermarks
- Very low particle counts
- Very low E metallics
- Trace level organics
- Molecular level drying
- No substrate breakage
- No feature damage (no spin drying)
- No ESD damage
- Excellent for high aspect ratio structures
- Reduces chemical consumption
- Cost savings through improved cycle times & reduced maintenance
- Excellent alternative to spin rinser dryer

#### Features

- Automatic, high-volume single or dual cassette configurations
- Adaptable for silicon, solar & other applications
- Available as stand-alone unit or integrated into wet benches
- Programmable processing recipes
- User-friendly software with touch screen interface
- No exposed metal components
- No moving parts

### Substrate Drying with No Watermarks



*MTS Gradient Dryer stand-alone unit*

The Gradient Dryer uses the difference between the surface tension of H<sub>2</sub>O and IPA to produce a gradient that generates fast and effective substrate drying. Surface tension gradient drying yields substrates that are watermark-free with low particle counts and no feature damage. Since there are no metallic components inside the dryer chamber, charge damage is virtually eliminated. There are no moving parts in the Gradient Dryer, and the elimination of spin drying dramatically reduces breakage, especially critical for today's thinner substrates.

Besides the elimination of watermarks on hydrophilic, hydrophobic and combination films, surface tension drying provides other benefits. This drying method does not place any mechanical stresses on the substrate. The technique works well on practically any flat substrate. No surfactants are necessary to change the substrate properties to enhance drying performance. Compared to traditional



*MTS Gradient Dryer is adaptable for silicon, solar, disk drive and other applications*

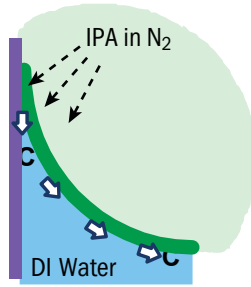
vapor dryers, the Gradient Dryer dryers consume very little IPA. When integrated with cleaning and rinsing, this tool can provide a one-step process for such applications as the fabrication and cleaning of ICs, solar cells, fuel cells, MEMS and disk drives.

The Gradient Dryer processes a batch of 25 or 50 wafers in ~10-15 minutes depending on configuration. The dryers are configurable to accept one or two cassettes from 150mm to 300mm and can be produced as stand-alone units or integrated into wet processing stations.

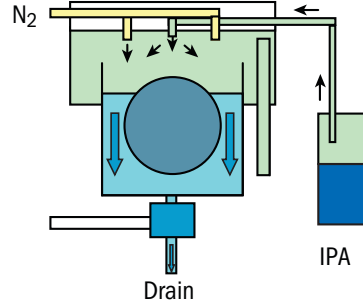
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PRODUCT NOTE

## Surface Tension Gradient Dryer



*IPA concentration gradient induces surface tension gradient drying without watermarks.*



*Cross section of the Gradient Dryer*

## The Gradient Dryer Product Line

	Gradient Dryer Model					
	1150	2150	1200	2200	1300	2300
<b>Substrates</b>						
150mm cassettes	1	2				
200mm cassettes			1	2		
300mm cassettes					1	2
<b>Features</b>						
Front & rear access	•	•	•	•	•	•
Direct Spin Rinser Dryer (SRD) replacement	•	•	•			
Integrated into wet bench	•	•	•	•	•	•
Stand alone	•	•	•	•	•	•
Available in smaller substrate sizes	•	•				