



DuPont™ Solamet® PV52x Photovoltaic Metallization

DuPont Microcircuit Materials

DuPont™ Solamet® PV52x

Photovoltaic Metallization






- Lower Unit Consumption per Cell
- Enhanced Adhesion & Reliability Performance
- Sustained High Power Output

Unique Chemistry Delivering Higher Cell Performance and Higher Module Reliability

DuPont™ Solamet® PV52x

Photovoltaic Metallization

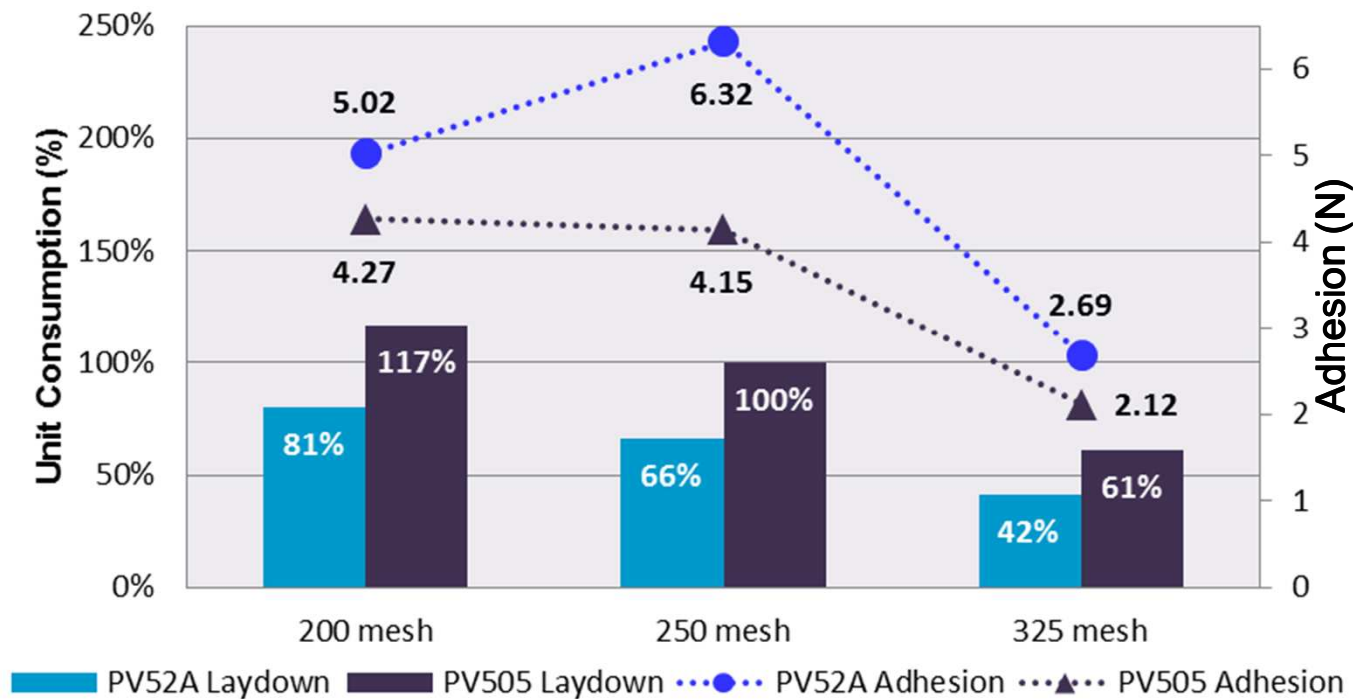


- 
Lower Unit Consumption per Cell
- 
Enhanced Adhesion & Reliability Performance
- 
Sustained High Power Output

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Less usage and better adhesion

Unit Consumption & Adhesion vs Different Mesh



>30% Consumption Saving Can Be Achieved While Keeping Superior Adhesion

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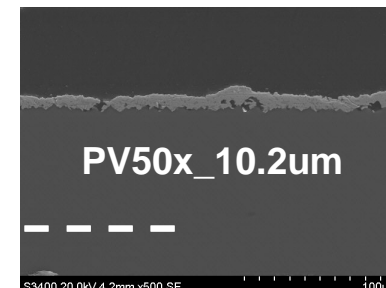
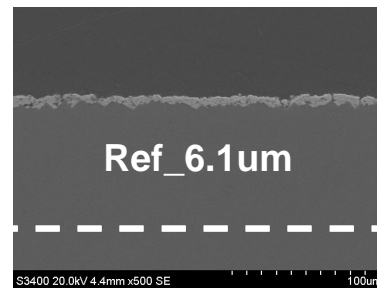
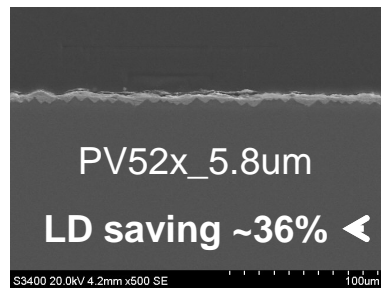
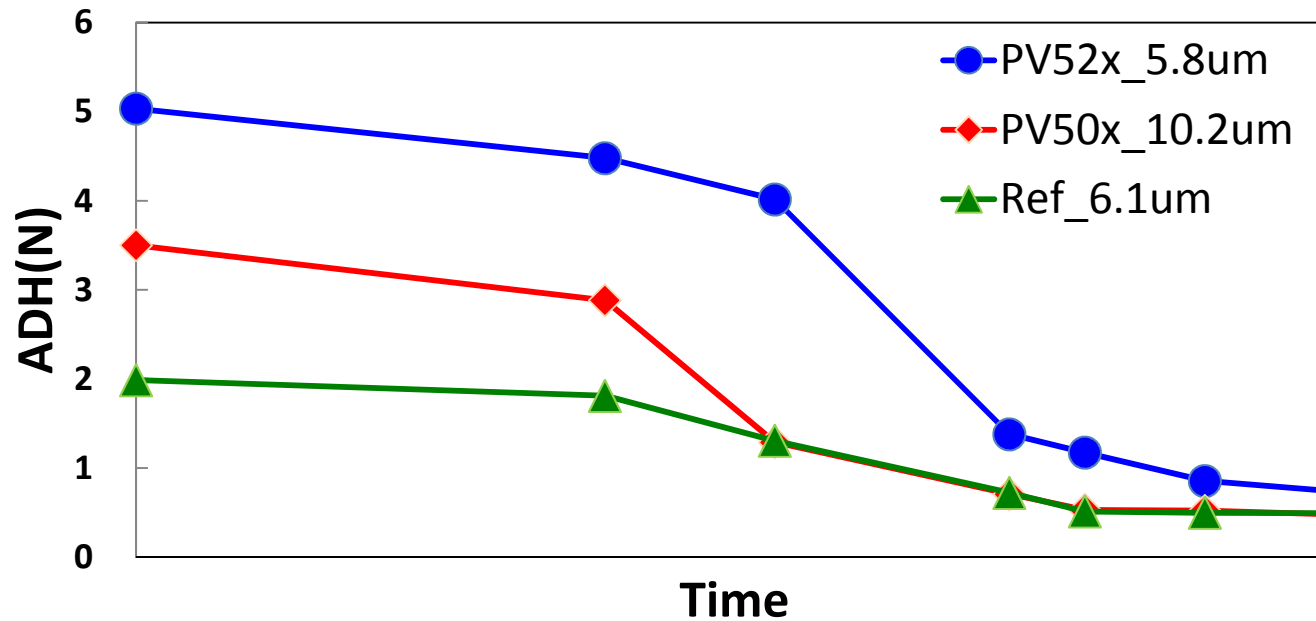
Photovoltaic Metallization



- Lower Unit Consumption per Cell
- **Enhanced Adhesion & Reliability Performance**
- Sustained High Power Output

DuPont™ Solamet® PV52x

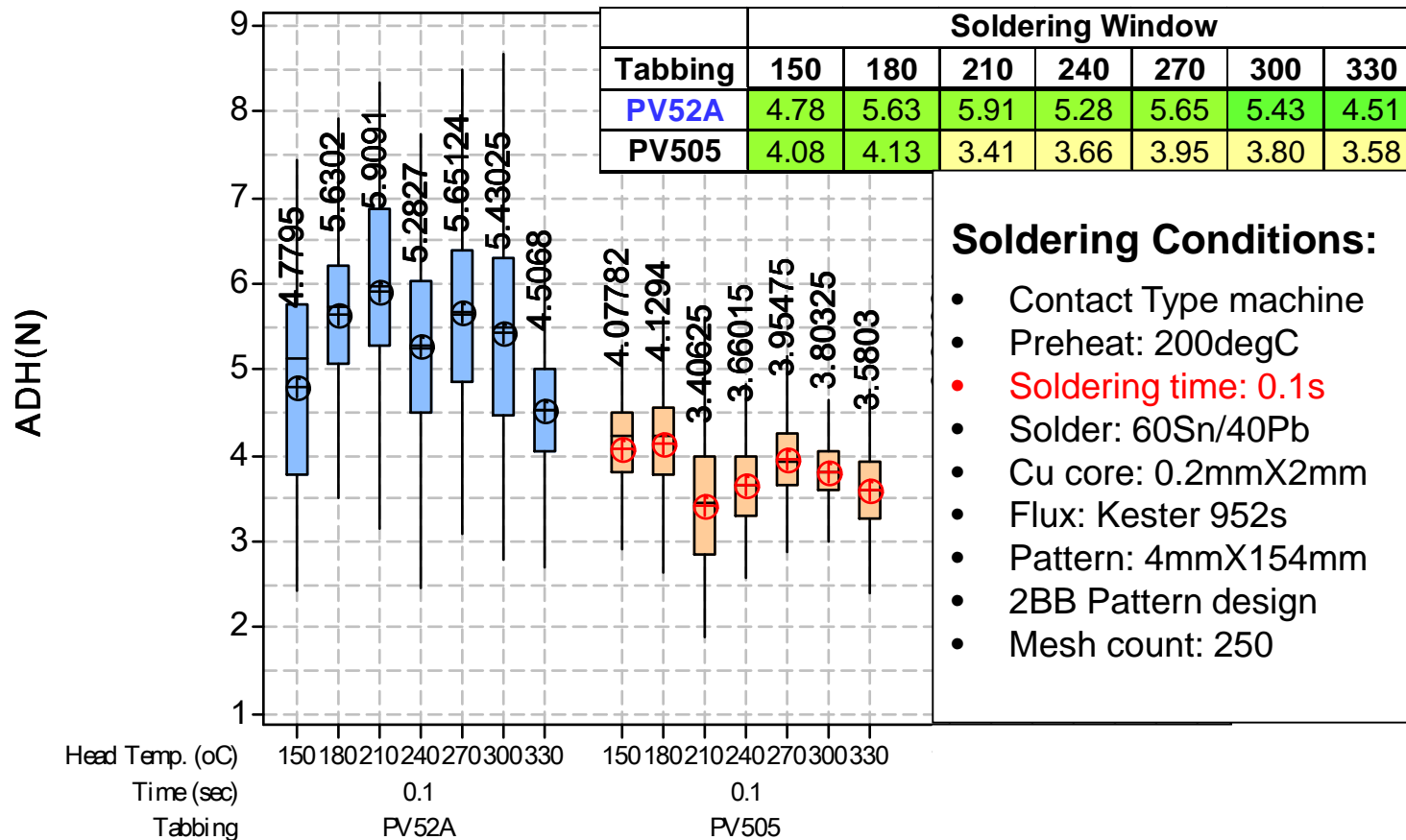
Better aged adhesion / reliability at low thickness level



Superior Aged Adhesion Performance with More Than 30% Paste Saving

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Enhanced Soldering Window



Wider Soldering Window Simulated Compared to Incumbent

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Photovoltaic Metallization



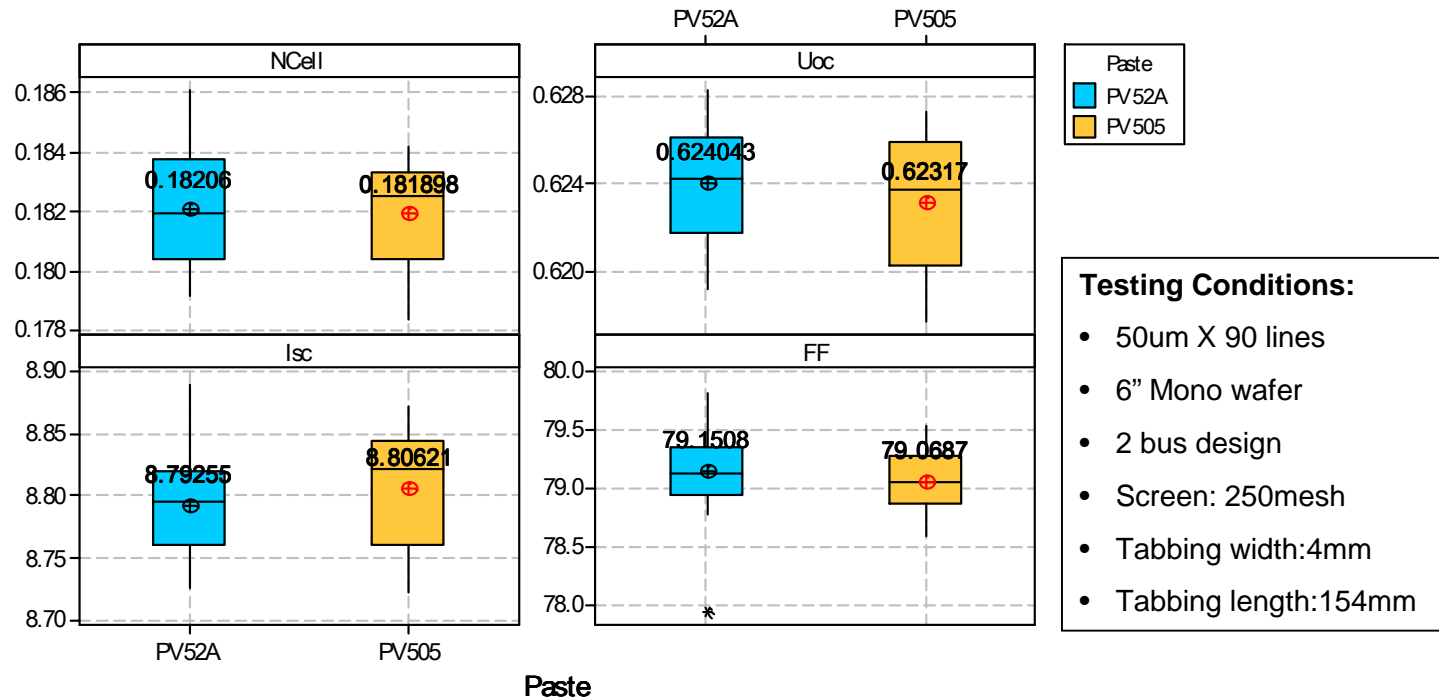
- Lower Unit Consumption per Cell
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Consistent Electrical Performance

Paste	Laydown	Consumption	Eff.	FF	Isc	Voc	Rs	Rsh	Rfront	Rback
PV52A	0.055g	-35%	18.21%	79.15	8.793	0.624	2.41	322	0.0264	0.0058
PV505	0.085g	0%	18.19%	79.07	8.806	0.623	2.44	348	0.0267	0.0057

Boxplot of NCell, Uoc, Isc, FF



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Thermal Cycle Test of Mini-Module

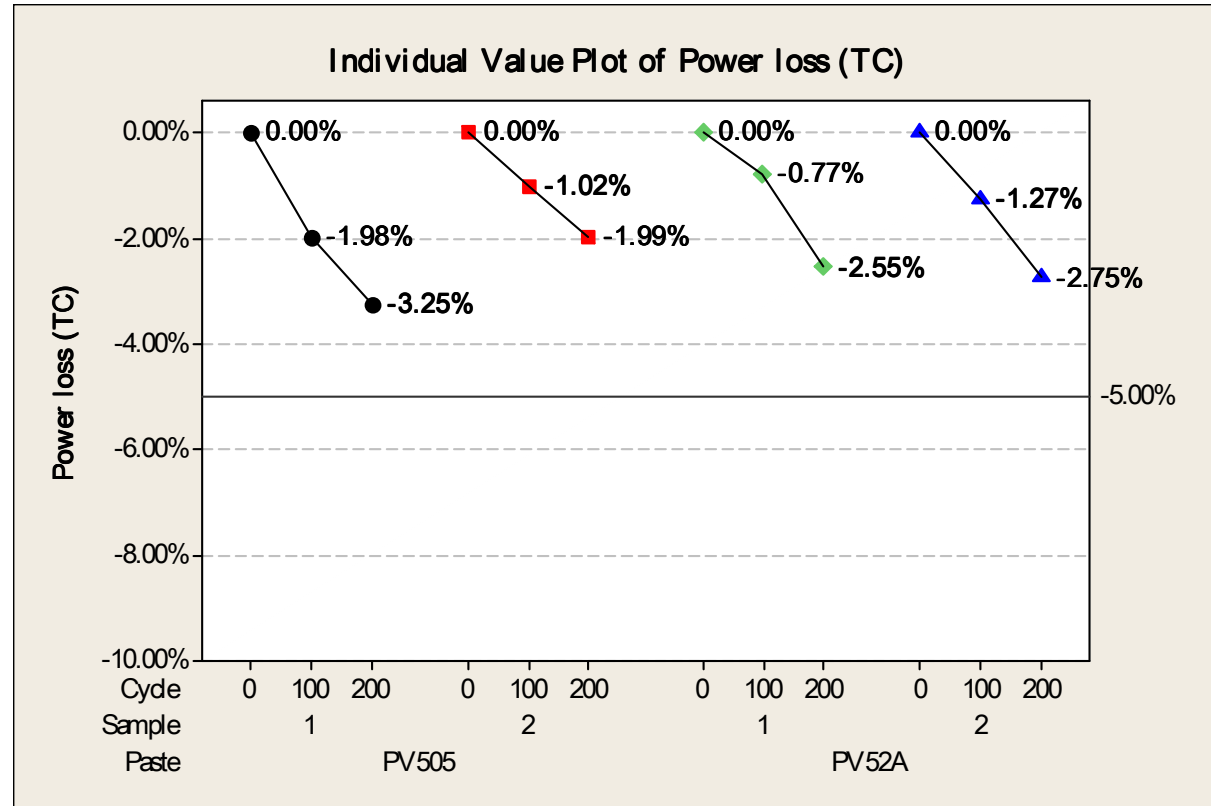
Test Sample:

**Single piece
mini-module
6" Mono Cell**

Thermal cycling:
+85°C to - 40°C

Duration:

200 cycles



Power Loss of Thermal Cycle Test for PV52A Mini-module is Less Than 3% After 200 Cycles

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Damp Heat Test of Mini-Module

Test Sample:

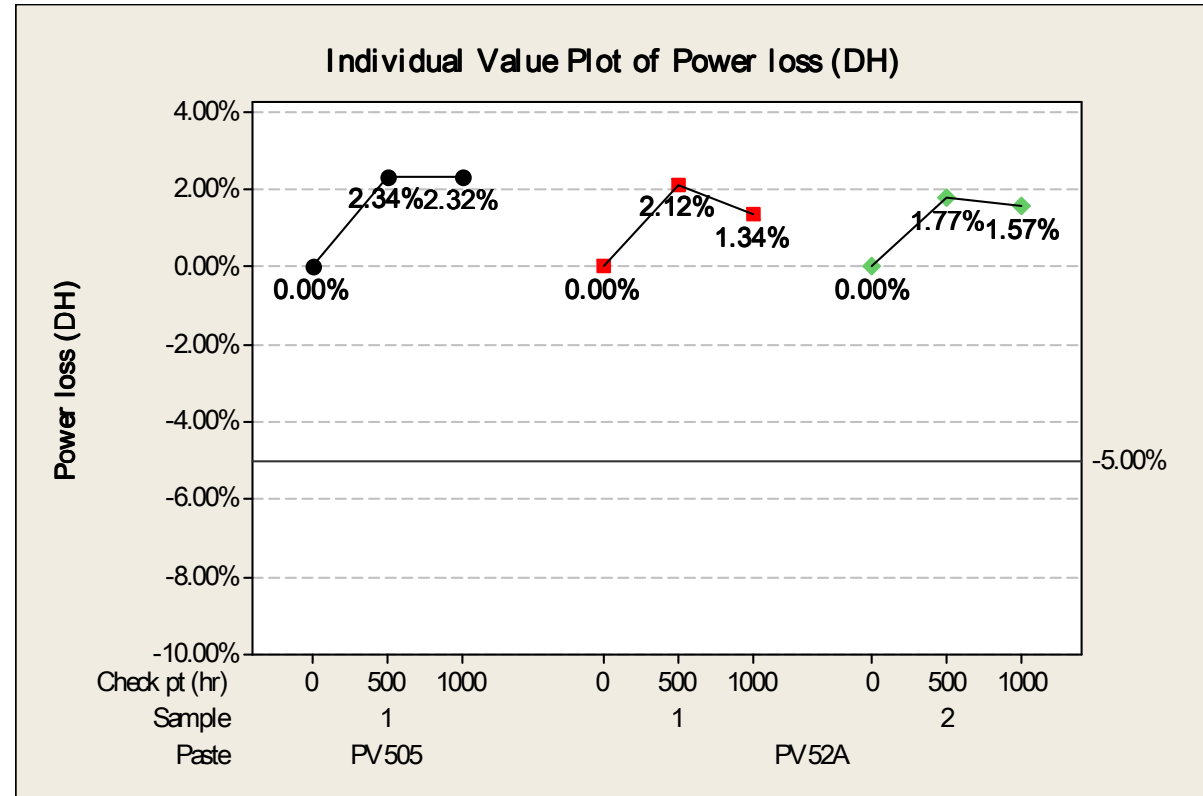
**Single piece
mini-module**

6" Mono Cell

Testing Conditions:

**85°C and 85%
relative humidity**

Duration:
1000 hrs



**Power Loss of Damp Heat Test for PV52A Mini-module is Less Than
3% After 1000 Hours**

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Process Recommendations

Paste	Mesh	LD(mg)			SEM x500	SEM x1K
PV52A	250	54	0.044	4.8		
PV52A	200	67	0.054	5.8		

Recommended Laydown for Customers:

$$LD \text{ (mg)} = 0.044 \text{ (mg/mm}^2\text{)} \times \text{tabbing pattern design area (mm}^2\text{)}$$

Recommended Screen Design:

- Mesh: 250 / 200 mesh
- Emulsion THK: 5-10um
- *Ex: 200 mesh/40um wire/5um emul. THK*



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