Flexible Modules/ Flexible Design

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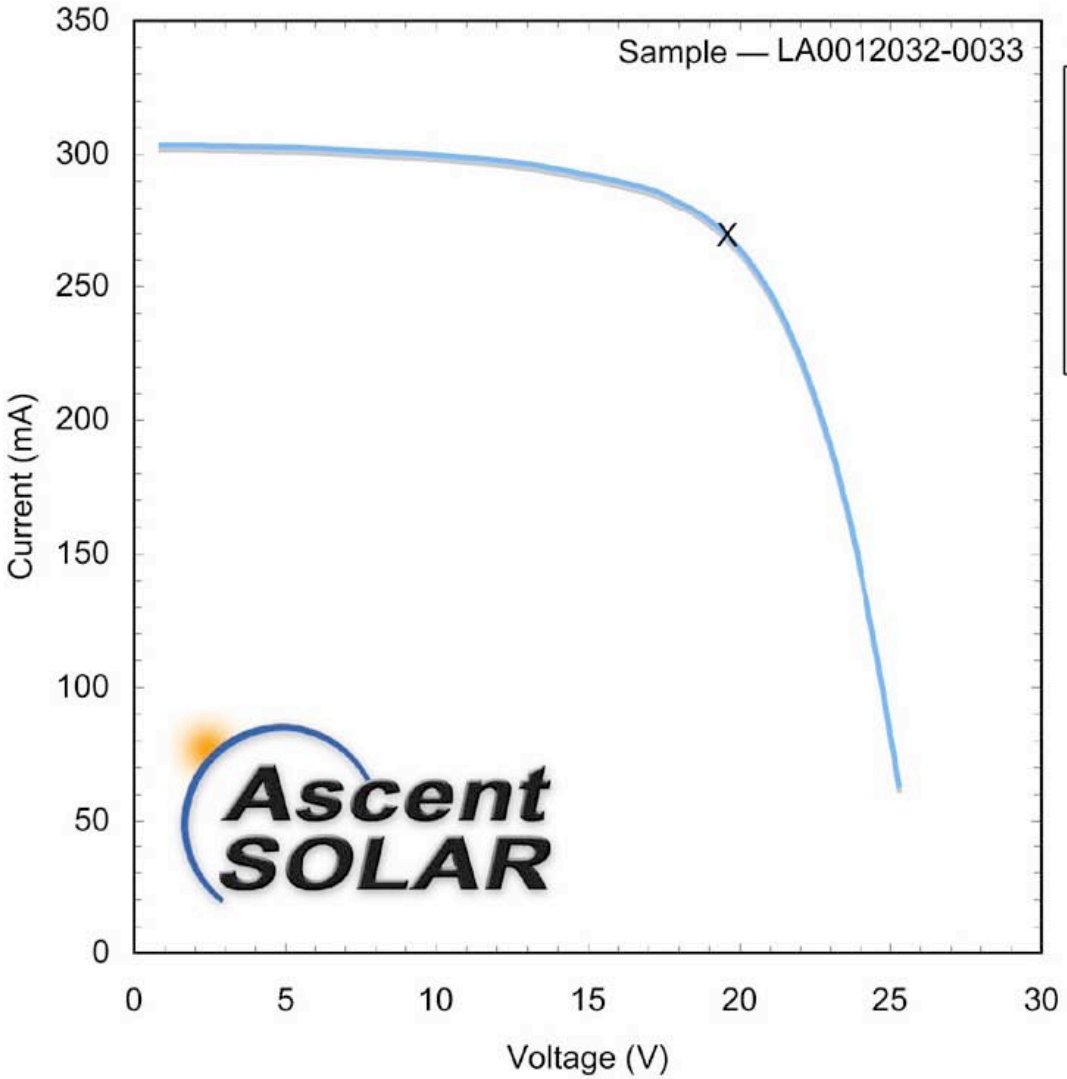
Award-Winning Technology

- **R&D Magazine has Selected Ascent Solar Technologies' Innovative Monolithically-integrated CIGS Photovoltaic Product on Polyimide Substrate as one of the *100 Most Innovative Technologies for 2010***

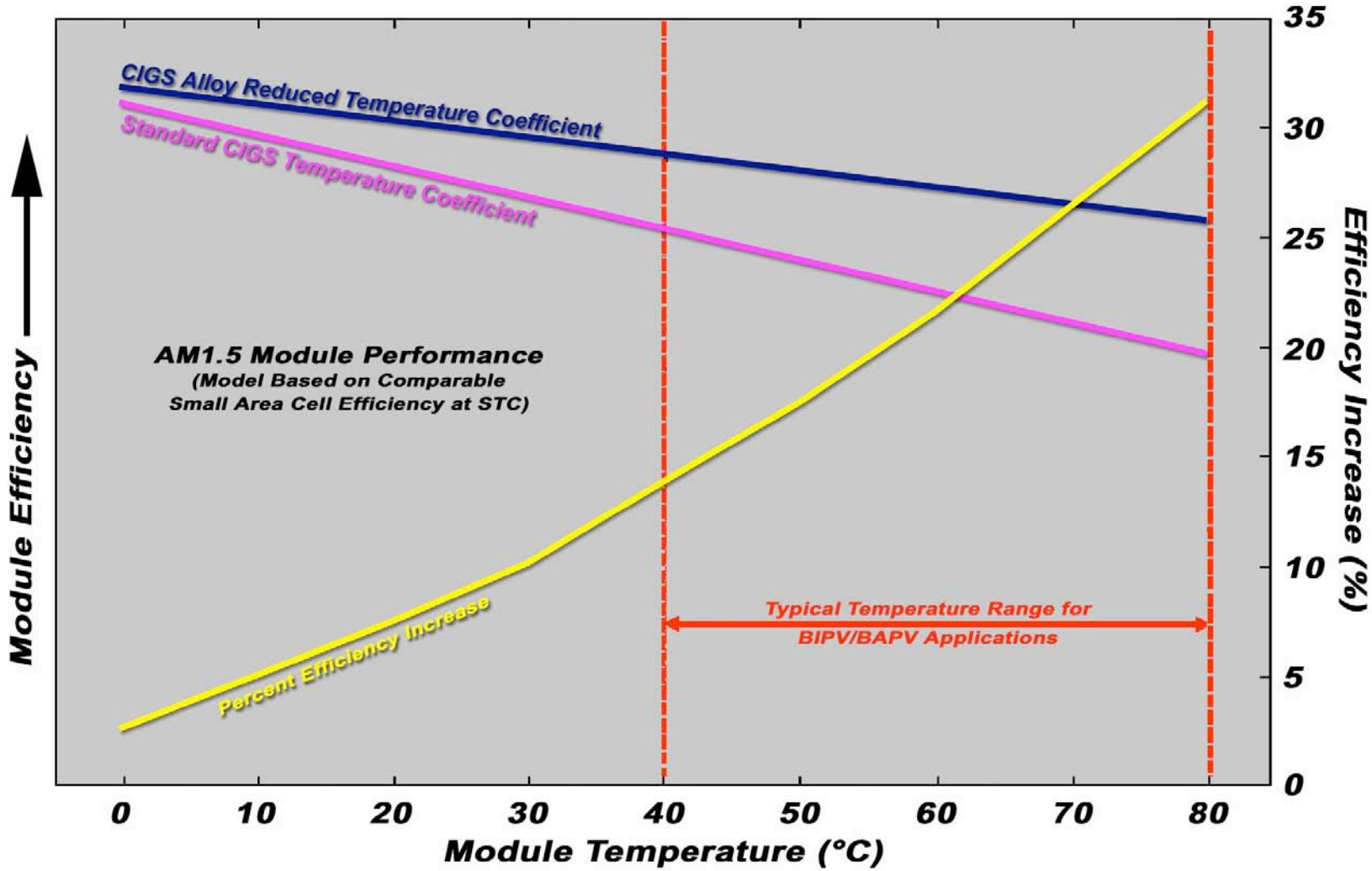
Current Module Performance



15 cm x 30 cm Module

Power	5.27
Vmp (V)	19.54
Voc (V)	26.13
Imp (mA)	269.8
Isc (mA)	303.9
FF	0.664
Efficiency %	12.06

Reducing Temperature Coefficient for Greater Module Performance

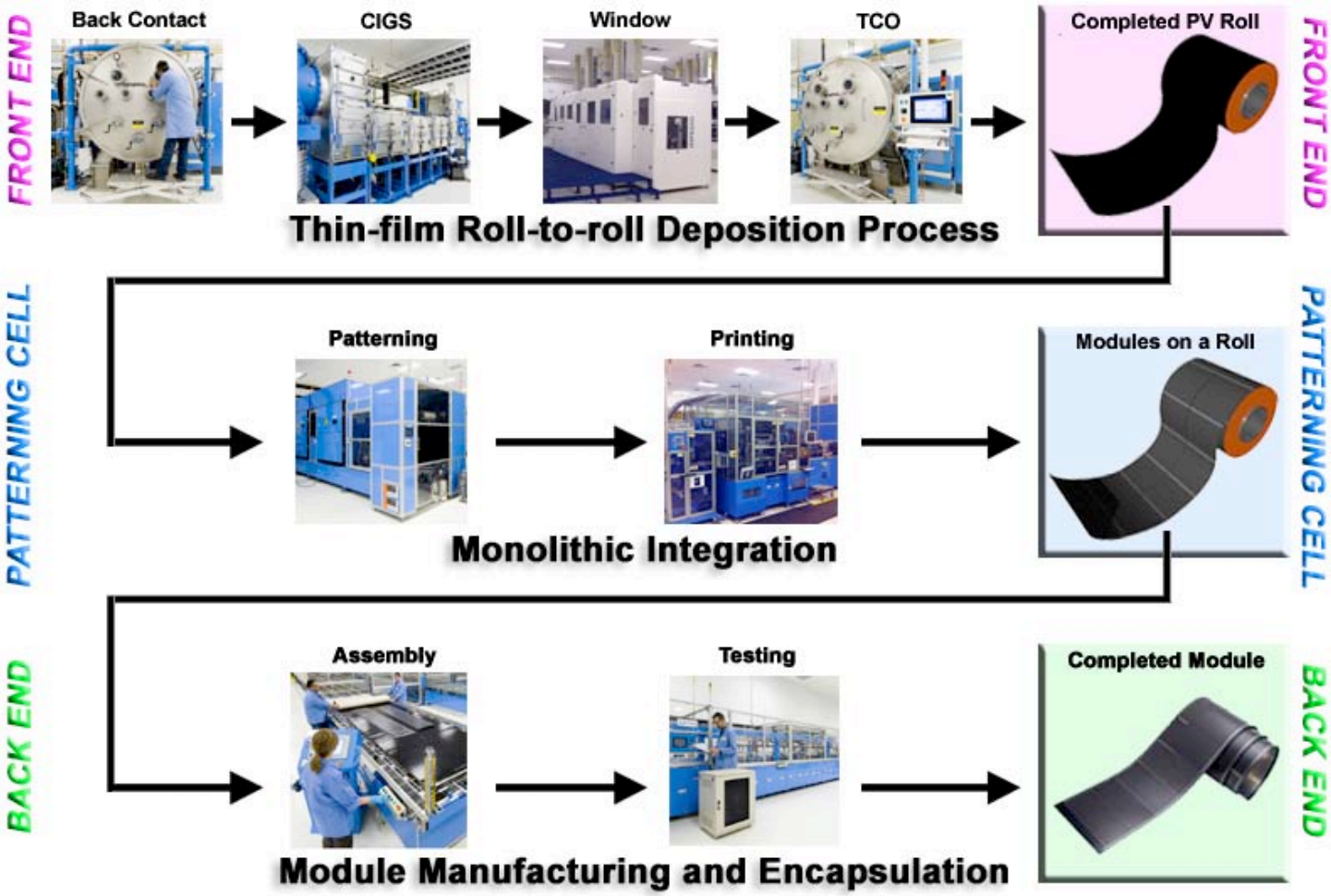


Certification Update

- **IEC 61646 Certification for 2m**
- **Certification Pending**
  - UL 1703 Certification for 2m
  - IEC 61646 / 61730 and UL 1703 for 5m

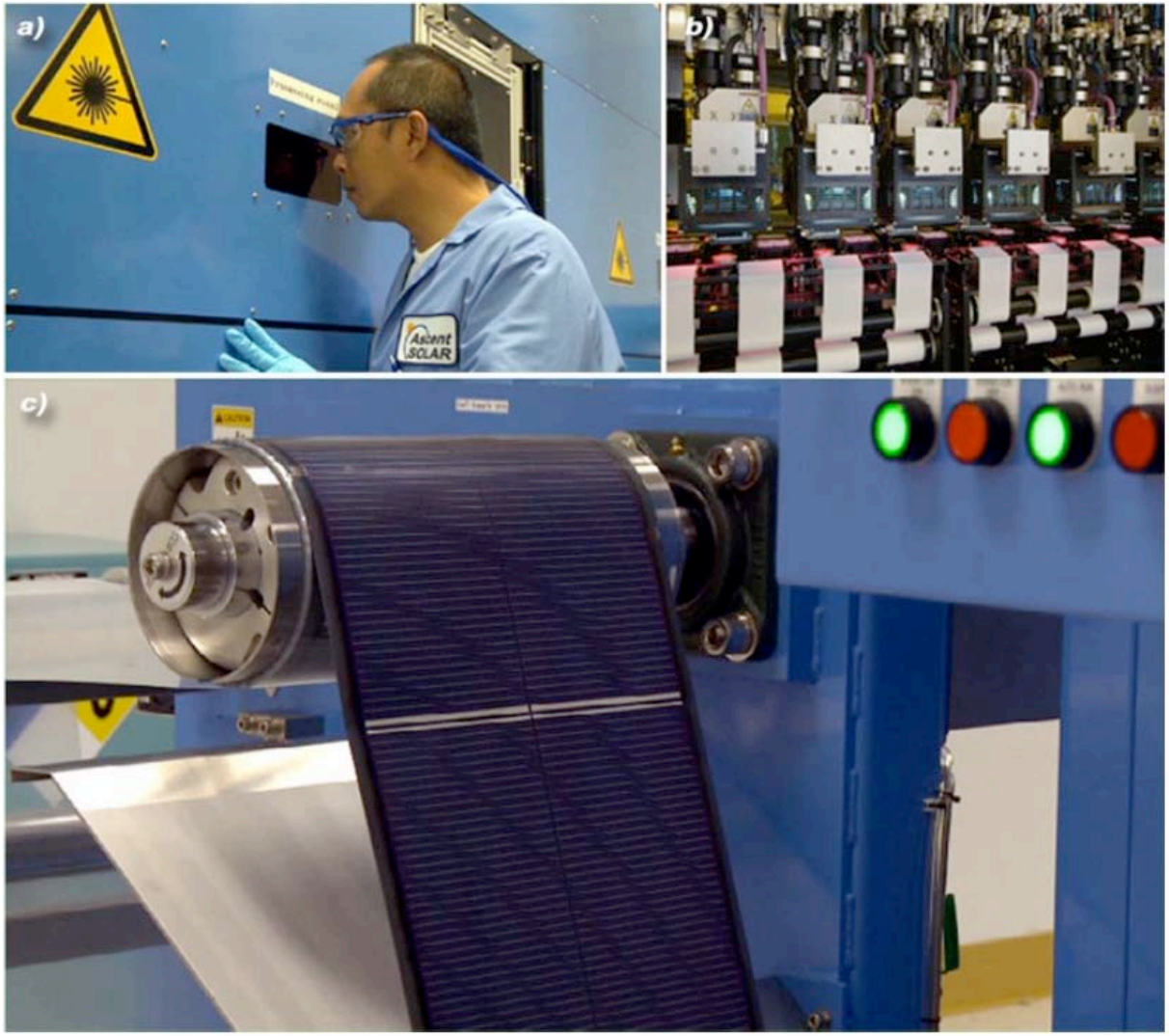
Our CIGS Process

- **Relies Upon Roll-to-Roll Deposition and Patterning**



Roll-to-Roll Patterning to Reduce Back-end Assembly Cost

- **Migration to Larger Building Block Completely Commensurate with Production**



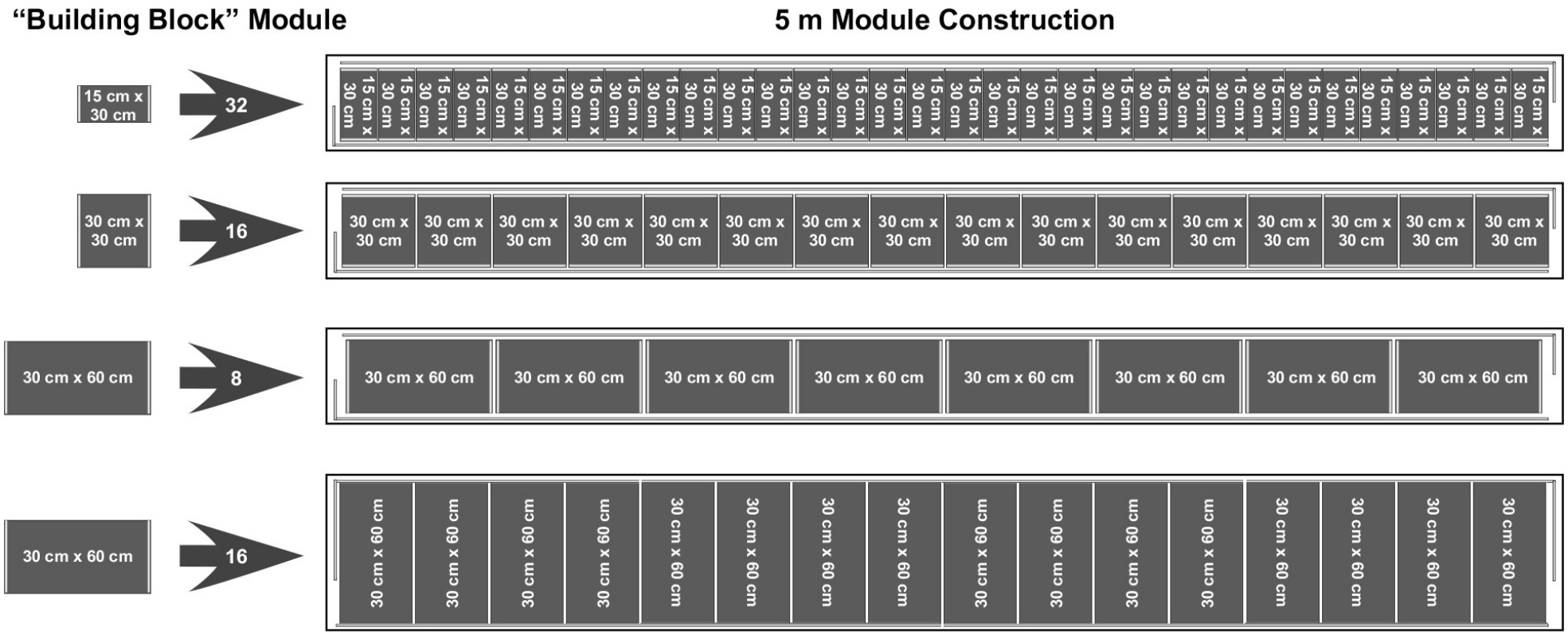
Migration to Larger Building Blocks

- **Reduced Part Count**
- **Easier Assembly**
- **Reduced Cost**
- **Reduced Ohmic Losses Between Submodules**

'Double-Wide' 5m Module (WSLB 3200-190)
•Announced 9/7/2010
•Up to 320 W
•Up to 190 Volts
•Up to 50 Watts/kg

AST's Flexible CIGS on Polyimide - Flexible by Design

- **Various Combinations to Create 5m Modules**



Not Actual Design - For Reference Only

AST Questions to the Inverter/Electronics Community

- **Is There an 'Ideal' Voltage?**
  - Within Existing Building Code
  - Revised Code within Safety Margins
- **At What Point/Range is it Realistic to Consider On-Module Inverters?**
  - Flexible Modules Provide More Power with Lighter Weight
    - Enables Larger Higher Power Modules with Ease of Installation
  - Is There a 'Sweet Spot' in Inverter Power/Module Integration?
- **What are the Physical Limits?**
  - Today
  - Next 5-10 Years