
EUROTRON
EMBRACING SUNLIGHT

tel +31 (0)184 69 11 05 web eurotron.com

Member of Eurogroep


Our mission
Embracing sunlight – to the full !

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About Eurotron

- Global leader in manufacturing of back contact modules
- Process development (Eurolab)
- In-house design & construction
- Equipment for back contact PV modules
- Supplier to internationally operating tier-one producers

- Single focus: **PCB-BASED** back-contact: power – robustness – longevity
- Designed for MWT, IBC, HJ-BC, EWT ……. ➔ all back contact cells

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Eurolab

- Unique: dedicated for back contact
- Equipped with mass scale identical process steps
- Available for R&D, material vendors, solar challenge teams, pre-production, production for fast track certification and process mirroring

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2005
Start of Eurotron

2008
EuroMax5 line installed

2009
Market introduction

2011
2 x EuroMax90 lines delivered in China

2013
Equipment delivered to China & Qatar

2014
Expansions in China & Qatar

2014
Opening EuroLab

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2015
EuroMax90 line sold

2016
6 x EuroMax90 lines sold

2018
Implementation of 2GWp equipment

2019
EuroMax60 line sold in USA

2020
EuroMax expansion existing customer

2021
EuroMax90 lne sold in USA

2022
EuroMax60 line sold in automotive

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Process

The best flight is a boring flight

The best mfg is …… boring

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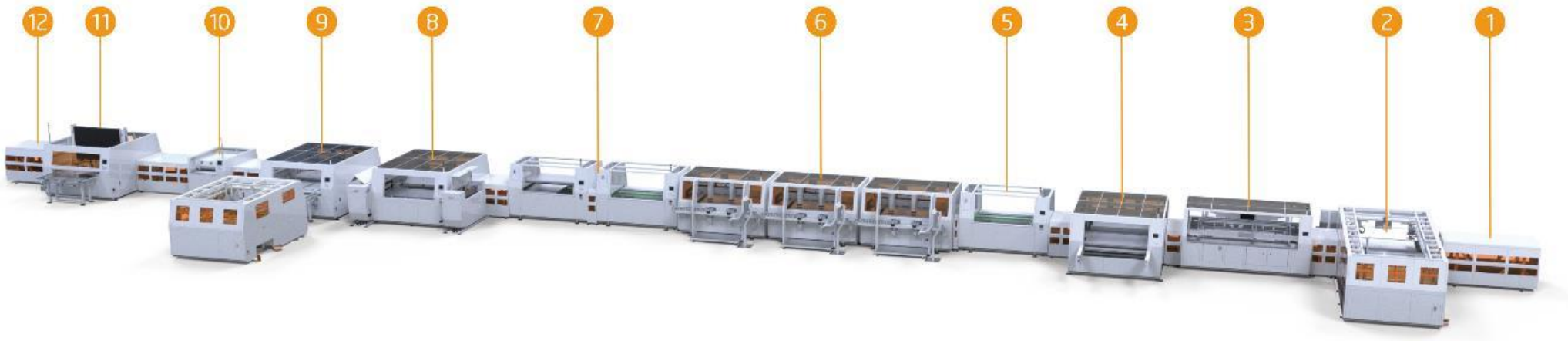
Process explanation



Process steps:

1. Upwards elevator
2. Back sheet lay-up
3. Interconnection
4. Application of encapsulant
5. Quality inspection
6. Cell positioning
7. Quality inspection
8. Encapsulant unwinding and application
9. Glass de-stacking and lay-up
10. Pre-tagging
11. Flipping
12. Downwards elevator

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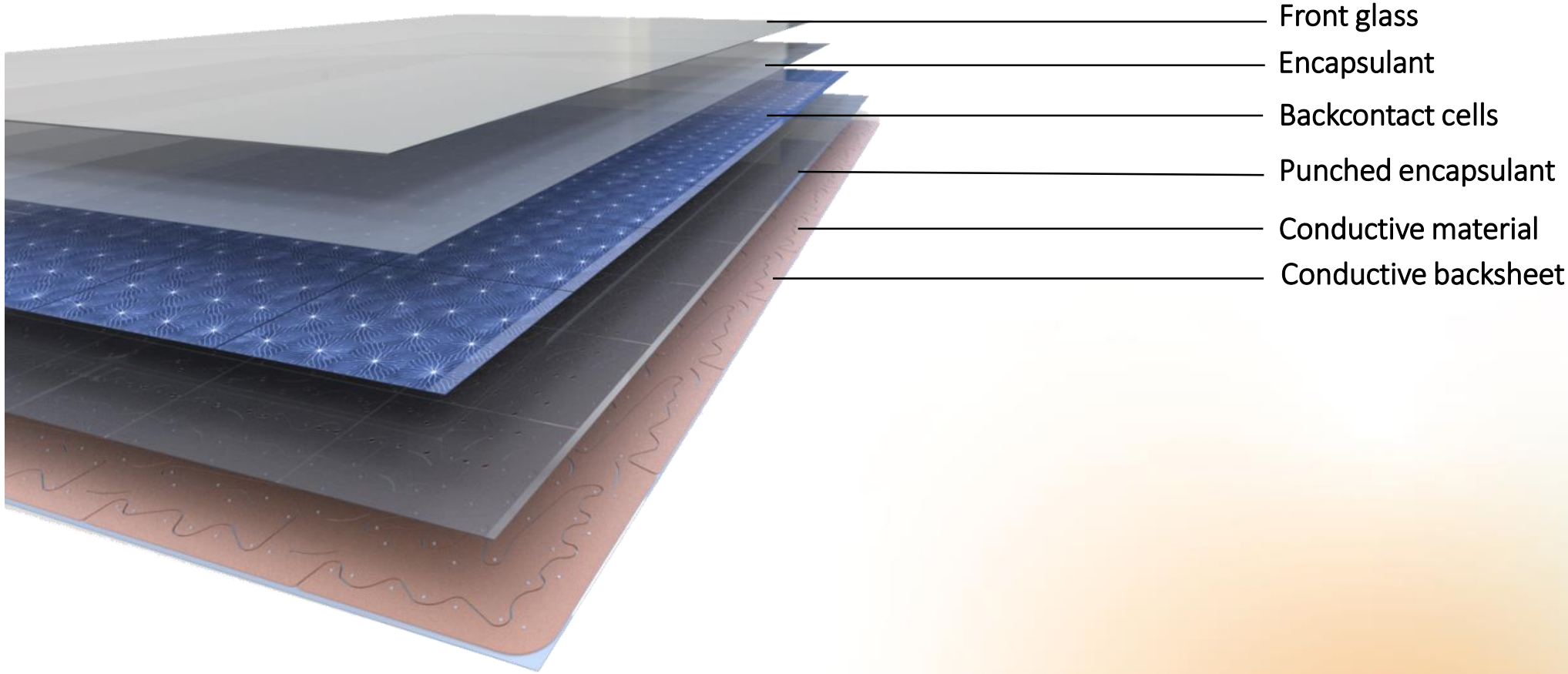
Material stack



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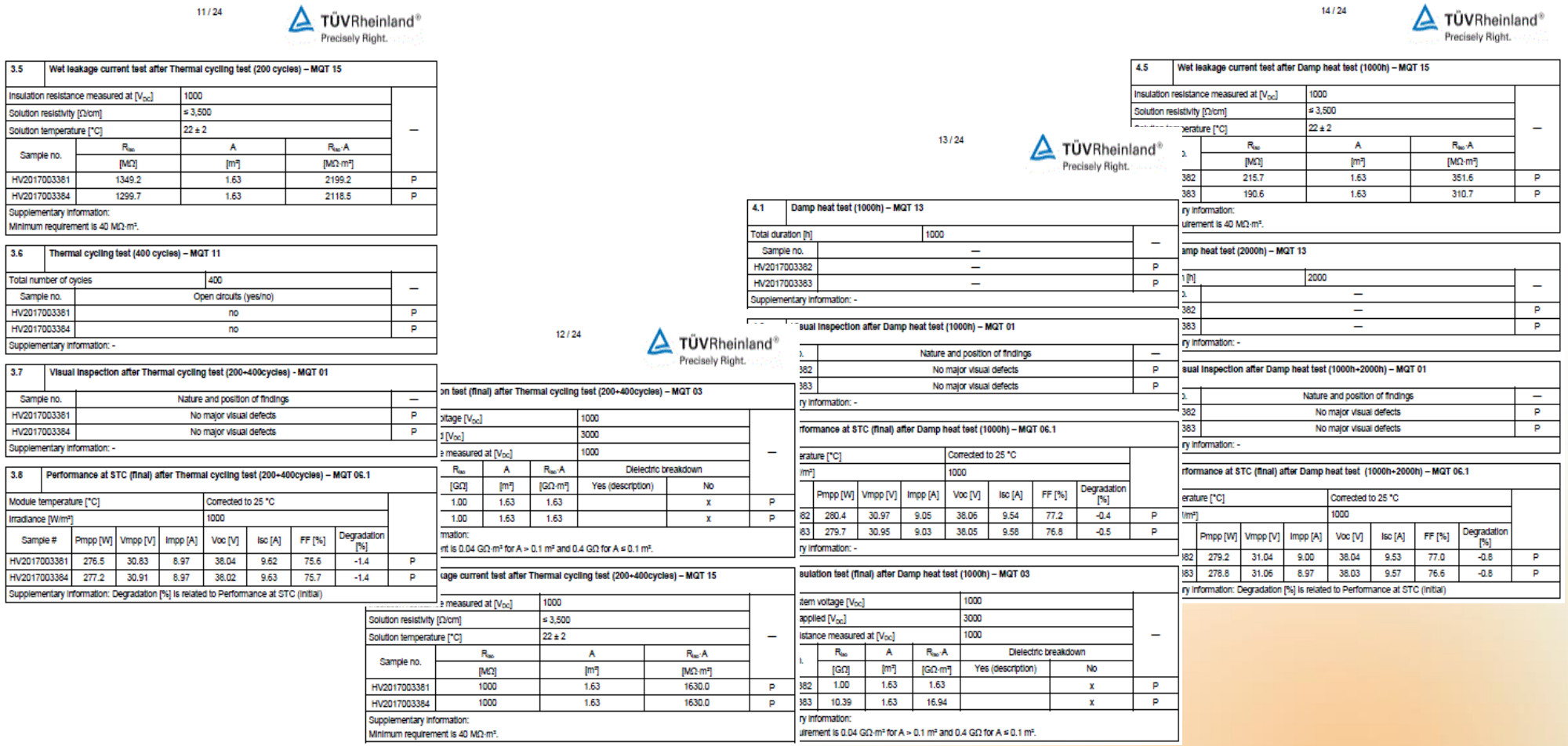
Mass scale manufacturing

Mass scale manufacturing

Robustness – 2nd to none



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TÜVRheinland® Precisely Right.

3.5	Wet leakage current test after Thermal cycling test (200 cycles) – MQT 15			
Insulation resistance measured at [V_{DC}]		1000		—
Solution resistivity [Ω/cm]		≤ 3,500		
Solution temperature [°C]		22 ± 2		
Sample no.	R_{iso} [MΩ]	A [m²]	R_{iso}·A [MΩ·m²]	
HV2017003381	1349.2	1.63	2199.2	P
HV2017003384	1299.7	1.63	2118.5	P
Supplementary information: Minimum requirement is 40 MΩ·m².				

3.6	Thermal cycling test (400 cycles) – MQT 11		
Total number of cycles		400	—
Sample no.	Open circuits (yes/no)		
HV2017003381	no		P
HV2017003384	no		P
Supplementary information: -			

3.7	Visual inspection after Thermal cycling test (200+400cycles) - MQT 01	
Sample no.	Nature and position of findings	—
HV2017003381	No major visual defects	P
HV2017003384	No major visual defects	P
Supplementary information: -		

3.8	Performance at STC (final) after Thermal cycling test (200+400cycles) – MQT 06.1								
Module temperature [°C]				Corrected to 25 °C					
Irradiance [W/m²]				1000					
Sample #	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]	Degradation [%]		
HV2017003381	276.5	30.83	8.97	38.04	9.62	75.6	-1.4		P
HV2017003384	277.2	30.91	8.97	38.02	9.63	75.7	-1.4		P
Supplementary information: Degradation [%] is related to Performance at STC (initial)									

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	on test (final) after Thermal cycling test (200+400cycles) – MQT 03					
	oltage [V_{DC}]			1000		—
	[V_{DC}]			3000		
	e measured at [V_{DC}]			1000		
	R_{iso} [GΩ]	A [m²]	R_{iso}·A [GΩ·m²]	Dielectric breakdown: Yes (description)	No	
	1.00	1.63	1.63		x	P
	1.00	1.63	1.63		x	P
	rmation: nt is 0.04 GΩ·m² for A > 0.1 m² and 0.4 GΩ for A ≤ 0.1 m².					

	age current test after Thermal cycling test (200+400cycles) – MQT 15			
	e measured at [V_{DC}]	1000		—
Solution resistivity [Ω/cm]		≤ 3,500		
Solution temperature [°C]		22 ± 2		
Sample no.	R_{iso} [MΩ]	A [m²]	R_{iso}·A [MΩ·m²]	
HV2017003381	1000	1.63	1630.0	P
HV2017003384	1000	1.63	1630.0	P
Supplementary information: Minimum requirement is 40 MΩ·m².				

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4.1	Damp heat test (1000h) – MQT 13		
Total duration [h]		1000	—
Sample no.		—	
HV2017003382		—	P
HV2017003383		—	P
Supplementary information: -			

	sual inspection after Damp heat test (1000h) – MQT 01	
	Nature and position of findings	—
	No major visual defects	P
	No major visual defects	P
	ry information: -	

	rformance at STC (final) after Damp heat test (1000h) – MQT 06.1								
	erature [°C]			Corrected to 25 °C					
	l/m²]			1000					
	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]	Degradation [%]		
	280.4	30.97	9.05	38.06	9.54	77.2	-0.4		P
	279.7	30.95	9.03	38.05	9.58	76.8	-0.5		P
	ry information: -								

	suation test (final) after Damp heat test (1000h) – MQT 03					
	stem voltage [V_{DC}]			1000		—
	applied [V_{DC}]			3000		
	istance measured at [V_{DC}]			1000		
	R_{iso} [GΩ]	A [m²]	R_{iso}·A [GΩ·m²]	Dielectric breakdown: Yes (description)	No	
	1.00	1.63	1.63		x	P
	10.39	1.63	16.94		x	P
	ry information: uirement is 0.04 GΩ·m² for A > 0.1 m² and 0.4 GΩ for A ≤ 0.1 m².					

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4.5	Wet leakage current test after Damp heat test (1000h) – MQT 15			
Insulation resistance measured at [V_{DC}]		1000		—
Solution resistivity [Ω/cm]		≤ 3,500		
erature [°C]		22 ± 2		
	R_{iso} [MΩ]	A [m²]	R_{iso}·A [MΩ·m²]	
382	215.7	1.63	351.6	P
383	190.6	1.63	310.7	P
ry information: uirement is 40 MΩ·m².				

	mp heat test (2000h) – MQT 13	
] [h]	2000	—
	—	
382	—	P
383	—	P
ry information: -		

	sual inspection after Damp heat test (1000h+2000h) – MQT 01	
	Nature and position of findings	—
382	No major visual defects	P
383	No major visual defects	P
ry information: -		

	rformance at STC (final) after Damp heat test (1000h+2000h) – MQT 06.1								
	erature [°C]			Corrected to 25 °C					
	l/m²]			1000					
	Pmpp [W]	Vmpp [V]	Impp [A]	Voc [V]	Isc [A]	FF [%]	Degradation [%]		
382	279.2	31.04	9.00	38.04	9.53	77.0	-0.6		P
383	278.8	31.06	8.97	38.03	9.57	76.6	-0.8		P
ry information: Degradation [%] is related to Performance at STC (initial)									

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What did we experience since 2008 ?

- Equipment capacity 2,5% higher than anticipated
- Negligible manufacturing yield loss (± 0,05% depending on cells)
- Negligible Cell-to-Module power losses (almost ‘zero’)
- Field behaviour best in class (quality & performance)
- 30 Y EU insured warranty
- Commercially available at attractive prices
- No soldering-induced quality issues or degradation

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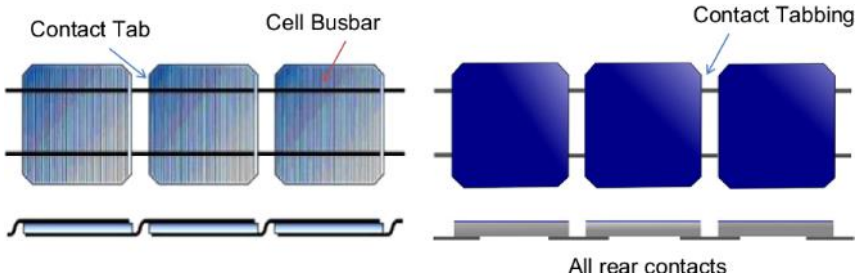
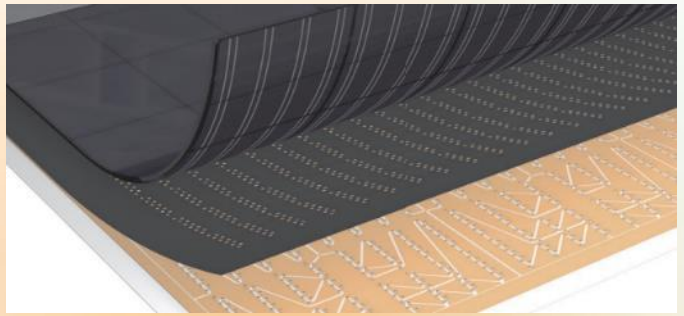
Pro's

- Reliable mass manufacturing since 2008
- Robustness in
  - Equipment
  - Process
  - Product
- Suitable for cut cells (½ - ⅓ - ¼ - etc.)
- Suitable for all cell dimensions - 10" already demonstrated in 2008

Any preference …… ?



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