



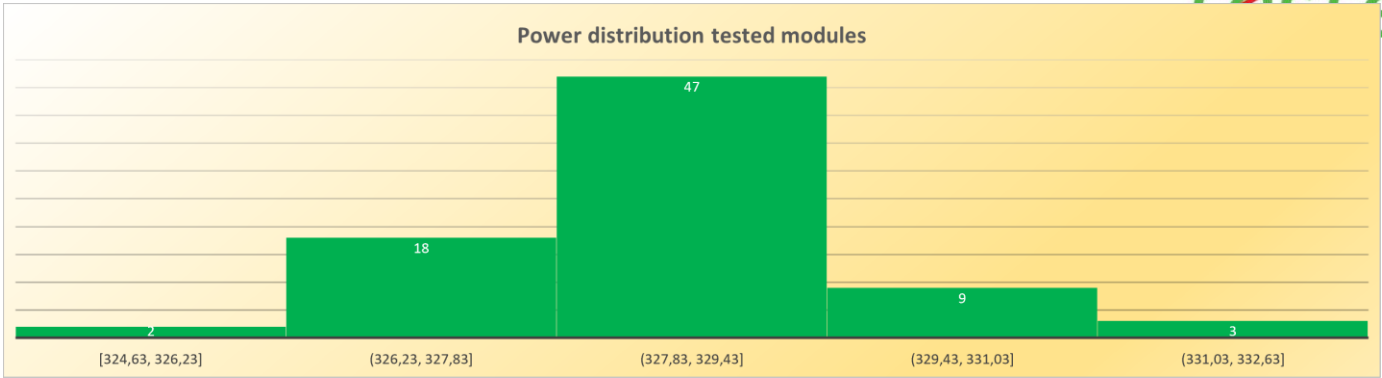
TEST REPORT



| Project Details | |
|-----------------|---|
| Client | |
| Test Location | Odin Rotterdam |
| Address | Makassarstraat 1 3199 LL Maasvlakte Rotterdam Nederland |
| Test Date | 26-sep-2019 |
| Operator | Rogier Vugts |

| Module Details | |
|------------------------------------|---------------|
| Module Brand | GCL |
| Module Type | GCL-M3/60H320 |
| Nominal power STC (nameplate) (Wp) | 320 |
| Number of cells per module | 60 |
| Number of modules tested | 79 |
| Number of Modules in project | |
| Percentage of batch/Container | |

| Test results nominal power measurement | Wp | % of nom | % dev |
|--|----------------------------|----------|-------|
| Average power at STC | 328,51 | 102,66% | 2,66% |
| Lowest STC power | 324,63 | 101,45% | 1,45% |
| Highest STC power | 332,63 | 103,95% | 3,95% |
| Standard deviation of power | 1,25 | 0,39% | |
| Calibration module | No | | |
| Minimal pass value | Without calibration module | 95% | |
| | With calibration module | 97% | |



Test results Electroluminescence imaging

Evaluation protocol: Standard MBI / TÜV - www.solartester.nl/downloads

| Cell classification | | # cells found | percentage |
|---------------------|---|---------------|------------|
| Unmarked | No abnormalities | 4672 | 98,57% |
| EL green | Uncritical cracks; cracks will not affect cell power | 66 | 1,39% |
| EL yellow | Critical: cracks may reduce cell power with less than 20% | 1 | 0,02% |
| EL red | Very critical: cracks may reduce cell power with more than 20% | 0 | 0,00% |
| EL blue | Other EL abnormalities (shunts, dark cells, printing failures, edge contamination, ...) | 1 | 0,02% |

Module Classification

| | | # of modules | percentage |
|---|---|--------------|------------|
| A | less than 10% green marked cells, no yellow or red | 78 | 98,73% |
| B | less than 20% green marked cells, less than 10% yellow, no red, total # marked cells less than 20% | 1 | 1,27% |
| C | more than 20% green marked, more than 10% yellow marked, less than 10% red marked, total # marked cells less than 30% | 0 | 0,00% |
| D | more than 10% red marked, total # marked cells more than 30% | 0 | 0,00% |

| Conclusion | |
|-----------------------------|---|
| Power Measurement | The test shows average module power is 2.66% higher than nameplate value. |
| Electroluminescence imaging | Further investigation on EL images factory not required |

| | |
|-----------|---|
| Date | 27-sep-2019 |
| Name | Rob van Gestel |
| Place | Rosmalen |
| Signature |  |

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Disclaimer

Flash / EL Data summary

| ModuleID | ParameterSetName | Judgement | MPP@STC | ELRed | ELYellow | ELGreen | CommentModule |
|-----------------|---------------------|-----------|---------|-------|----------|---------|---------------|
| 121907036890510 | GCL / GCL-M3/60H320 | CLASSA | 326,71 | 0 | 0 | 1 | |
| 121907056890789 | GCL / GCL-M3/60H320 | CLASSA | 326,9 | 0 | 0 | 0 | |
| 121907056891253 | GCL / GCL-M3/60H320 | CLASSA | 328,35 | 0 | 0 | 2 | |
| 121907056891327 | GCL / GCL-M3/60H320 | CLASSA | 329,5 | 0 | 0 | 1 | |
| 121907056891377 | GCL / GCL-M3/60H320 | CLASSA | 327,09 | 0 | 0 | 0 | |
| 121907056891443 | GCL / GCL-M3/60H320 | CLASSA | 327,65 | 0 | 0 | 0 | |
| 121907056891454 | GCL / GCL-M3/60H320 | CLASSA | 328,28 | 0 | 0 | 1 | |
| 121907056891457 | GCL / GCL-M3/60H320 | CLASSA | 328,3 | 0 | 0 | 0 | |
| 121907056891467 | GCL / GCL-M3/60H320 | CLASSA | 329,2 | 0 | 0 | 0 | |
| 121907056891502 | GCL / GCL-M3/60H320 | CLASSA | 329,04 | 0 | 0 | 0 | |
| 121907056891568 | GCL / GCL-M3/60H320 | CLASSA | 328,63 | 0 | 0 | 0 | |
| 121907056891593 | GCL / GCL-M3/60H320 | CLASSA | 327 | 0 | 0 | 2 | |
| 121907056891607 | GCL / GCL-M3/60H320 | CLASSA | 328,64 | 0 | 0 | 0 | |
| 121907056891618 | GCL / GCL-M3/60H320 | CLASSA | 328,54 | 0 | 0 | 2 | |
| 121907056891619 | GCL / GCL-M3/60H320 | CLASSA | 329,47 | 0 | 0 | 1 | |
| 121907056891623 | GCL / GCL-M3/60H320 | CLASSA | 327,06 | 0 | 0 | 0 | |
| 121907056891629 | GCL / GCL-M3/60H320 | CLASSA | 328,97 | 0 | 0 | 1 | |
| 121907056891630 | GCL / GCL-M3/60H320 | CLASSB | 328,02 | 0 | 1 | 1 | |
| 121907056891631 | GCL / GCL-M3/60H320 | CLASSA | 327,84 | 0 | 0 | 3 | |
| 121907056891636 | GCL / GCL-M3/60H320 | CLASSA | 327,83 | 0 | 0 | 1 | |
| 121907056891638 | GCL / GCL-M3/60H320 | CLASSA | 327,36 | 0 | 0 | 0 | |
| 121907066890001 | GCL / GCL-M3/60H320 | CLASSA | 329,23 | 0 | 0 | 0 | |
| 121907066890028 | GCL / GCL-M3/60H320 | CLASSA | 328,91 | 0 | 0 | 0 | |
| 121907066890048 | GCL / GCL-M3/60H320 | CLASSA | 325,54 | 0 | 0 | 2 | |
| 121907066890056 | GCL / GCL-M3/60H320 | CLASSA | 328,84 | 0 | 0 | 0 | |
| 121907066890063 | GCL / GCL-M3/60H320 | CLASSA | 329,57 | 0 | 0 | 0 | |
| 121907066890064 | GCL / GCL-M3/60H320 | CLASSA | 327,62 | 0 | 0 | 0 | |
| 121907066890066 | GCL / GCL-M3/60H320 | CLASSA | 328,4 | 0 | 0 | 1 | |
| 121907066890067 | GCL / GCL-M3/60H320 | CLASSA | 329,2 | 0 | 0 | 1 | |
| 121907066890071 | GCL / GCL-M3/60H320 | CLASSA | 329,02 | 0 | 0 | 1 | |
| 121907066890076 | GCL / GCL-M3/60H320 | CLASSA | 329,72 | 0 | 0 | 4 | |
| 121907066890077 | GCL / GCL-M3/60H320 | CLASSA | 330,27 | 0 | 0 | 0 | |
| 121907066890081 | GCL / GCL-M3/60H320 | CLASSA | 328,68 | 0 | 0 | 1 | |
| 121907066890083 | GCL / GCL-M3/60H320 | CLASSA | 327,86 | 0 | 0 | 0 | |
| 121907066890085 | GCL / GCL-M3/60H320 | CLASSA | 328,67 | 0 | 0 | 1 | |
| 121907066890099 | GCL / GCL-M3/60H320 | CLASSA | 327,61 | 0 | 0 | 0 | |
| 121907066890100 | GCL / GCL-M3/60H320 | CLASSA | 324,63 | 0 | 0 | 0 | |
| 121907066890106 | GCL / GCL-M3/60H320 | CLASSA | 328,15 | 0 | 0 | 0 | |
| 121907066890111 | GCL / GCL-M3/60H320 | CLASSA | 328,49 | 0 | 0 | 0 | |
| 121907066890114 | GCL / GCL-M3/60H320 | CLASSA | 327,9 | 0 | 0 | 2 | |
| 121907066890120 | GCL / GCL-M3/60H320 | CLASSA | 327,27 | 0 | 0 | 0 | |
| 121907066890130 | GCL / GCL-M3/60H320 | CLASSA | 327,18 | 0 | 0 | 0 | |
| 121907066890135 | GCL / GCL-M3/60H320 | CLASSA | 327,83 | 0 | 0 | 1 | |
| 121907066890141 | GCL / GCL-M3/60H320 | CLASSA | 329,55 | 0 | 0 | 0 | |
| 121907066890155 | GCL / GCL-M3/60H320 | CLASSA | 330,19 | 0 | 0 | 0 | |
| 121907066890157 | GCL / GCL-M3/60H320 | CLASSA | 330,65 | 0 | 0 | 1 | |
| 121907066890169 | GCL / GCL-M3/60H320 | CLASSA | 331,23 | 0 | 0 | 0 | |
| 121907066890170 | GCL / GCL-M3/60H320 | CLASSA | 332 | 0 | 0 | 0 | |
| 121907066890171 | GCL / GCL-M3/60H320 | CLASSA | 330,91 | 0 | 0 | 0 | |
| 121907066890227 | GCL / GCL-M3/60H320 | CLASSA | 328,03 | 0 | 0 | 1 | |
| 121907066890231 | GCL / GCL-M3/60H320 | CLASSA | 328,45 | 0 | 0 | 2 | |
| 121907066890233 | GCL / GCL-M3/60H320 | CLASSA | 327,79 | 0 | 0 | 0 | |
| 121907066890234 | GCL / GCL-M3/60H320 | CLASSA | 327,42 | 0 | 0 | 1 | |
| 121907066890236 | GCL / GCL-M3/60H320 | CLASSA | 326,54 | 0 | 0 | 1 | |
| 121907066890237 | GCL / GCL-M3/60H320 | CLASSA | 326,87 | 0 | 0 | 2 | |
| 121907066890240 | GCL / GCL-M3/60H320 | CLASSA | 327,86 | 0 | 0 | 1 | |
| 121907066890314 | GCL / GCL-M3/60H320 | CLASSA | 328,12 | 0 | 0 | 3 | |
| 121907066890355 | GCL / GCL-M3/60H320 | CLASSA | 328,03 | 0 | 0 | 0 | |
| 121907066890386 | GCL / GCL-M3/60H320 | CLASSA | 328,34 | 0 | 0 | 3 | |
| 121907066890399 | GCL / GCL-M3/60H320 | CLASSA | 329,09 | 0 | 0 | 2 | |
| 121907066890400 | GCL / GCL-M3/60H320 | CLASSA | 329,29 | 0 | 0 | 3 | |
| 121907066890403 | GCL / GCL-M3/60H320 | CLASSA | 328,46 | 0 | 0 | 0 | |
| 121907066890404 | GCL / GCL-M3/60H320 | CLASSA | 328,34 | 0 | 0 | 1 | |
| 121907066890409 | GCL / GCL-M3/60H320 | CLASSA | 328,4 | 0 | 0 | 2 | |
| 121907066890412 | GCL / GCL-M3/60H320 | CLASSA | 328,22 | 0 | 0 | 1 | |
| 121907066890414 | GCL / GCL-M3/60H320 | CLASSA | 328,94 | 0 | 0 | 1 | |
| 121907066890420 | GCL / GCL-M3/60H320 | CLASSA | 329,15 | 0 | 0 | 0 | |
| 121907066890452 | GCL / GCL-M3/60H320 | CLASSA | 329,17 | 0 | 0 | 1 | |
| 121907066890453 | GCL / GCL-M3/60H320 | CLASSA | 328,8 | 0 | 0 | 0 | |
| 121907066890460 | GCL / GCL-M3/60H320 | CLASSA | 327,48 | 0 | 0 | 1 | |
| 121907066890468 | GCL / GCL-M3/60H320 | CLASSA | 328,67 | 0 | 0 | 1 | |
| 121907066890470 | GCL / GCL-M3/60H320 | CLASSA | 328,67 | 0 | 0 | 2 | |
| 121907066890471 | GCL / GCL-M3/60H320 | CLASSA | 328,23 | 0 | 0 | 0 | |

Duidelijkheid over de kwaliteit en zekerheid over de opbrengst



| | | | | | | |
|-----------------|---------------------|--------|--------|---|---|---|
| 121907066890524 | GCL / GCL-M3/60H320 | CLASSA | 328,95 | 0 | 0 | 1 |
| 121907066890544 | GCL / GCL-M3/60H320 | CLASSA | 329,28 | 0 | 0 | 0 |
| 121907066890549 | GCL / GCL-M3/60H320 | CLASSA | 329,4 | 0 | 0 | 1 |
| 121907066890550 | GCL / GCL-M3/60H320 | CLASSA | 328,81 | 0 | 0 | 1 |
| 121907066890554 | GCL / GCL-M3/60H320 | CLASSA | 329,05 | 0 | 0 | 2 |
| 121907066890944 | GCL / GCL-M3/60H320 | CLASSA | 332,63 | 0 | 0 | 1 |