Damp Heat Testing Longer than IEC Standards

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INTRODUCTION

Indoor and outdoor measurements have been initiated for degradation monitoring and analysis: a new test laboratory has been equipped with climatic chambers and a PASAN 3 x 3 m flasher of **AAA quality**.

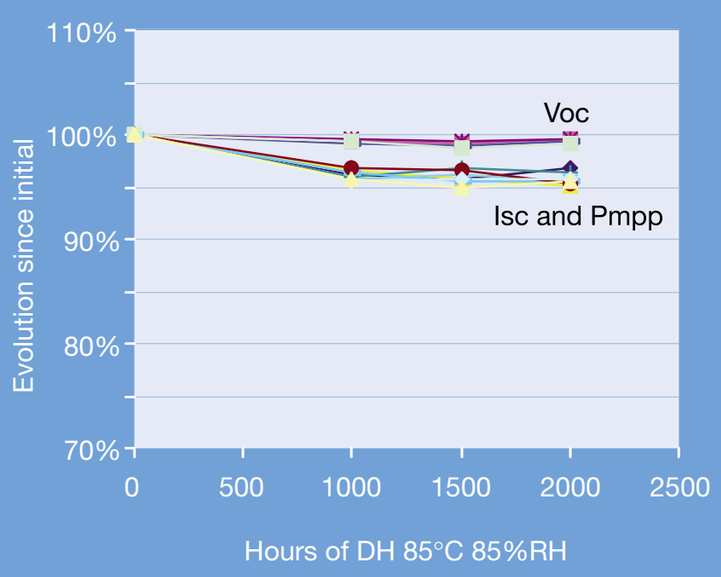
TEST CONDITIONS

Recently, 2000h of "IEC-like" Damp Heat at 85°C 85% RH has been completed on 3 types (A, B and C) of crystalline Silicon modules, **3 modules of each type have been aged, while one module is kept for reference.**

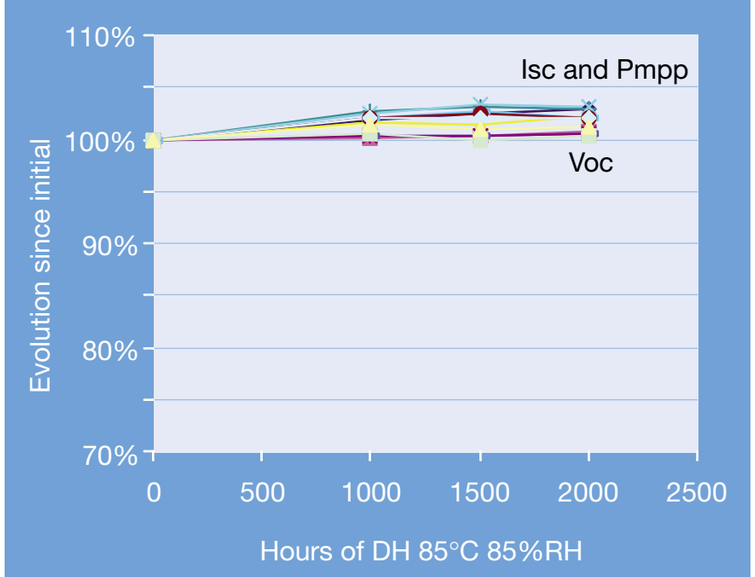
- Type A is mono-crystalline Silicon based. It has no aluminium frame. This is meant for fully integrated BIPV; indeed maximum French feed-in-tariff is obtained when the top surfaces of tiles/shingles and modules are coinciding (max 2 to 6 cm, for more information see ***www.ceiab-pv.fr***) so the PV system on the roof needs to be very thin.
- Type B and C modules are regular commercially available poly-crystalline Silicon modules, with frame.

RESULTS

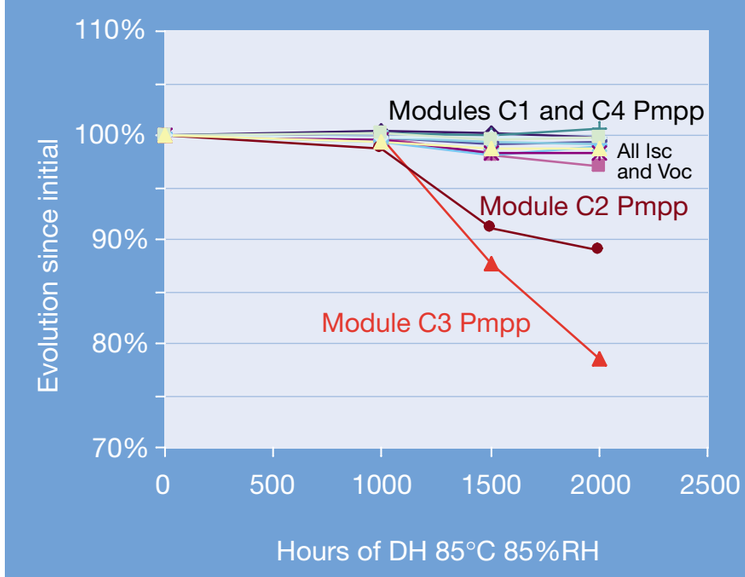
Type A mono-c Si modules, **without aluminium frame**



Type B poly-c Si modules



Type C poly-c Si modules



In both A and B type modules :
- the reference module and the aged modules have evolved in the same way :
- therefore there is no influence of 2000 h of DH8585 on the measured electrical properties.

Module C3 lost 23% on Pmpp.
Module C2 lost 12% on Pmpp.
Modules C1 and "non-aged" C4 stable.

CONCLUSIONS

After 2000 h of IEC like DH 85 85:

- A and B type modules are not degraded significantly (reference and aged modules have evolved in the same way).
- C type modules degrade
  - After 1500 h, 2 out of 3 type C modules have degraded about 10%.
  - After 2000 h these 2 modules continue to degrade "way over" 10%.

PERSPECTIVES

- Investigation on possible degradation mechanism(s) on C type modules due to DH 85 85.
- Comparison of indoor and outdoor measurements, see poster by Khalid Radouane *et al.* (EDF EN) also presented at this workshop.

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