

Anhang 5 zur Verfahrensweisung / Ausführungsbestimmung <i>Appendix to document / procedure</i>	Titel: <i>Title:</i> Handling, Storage and Processing of III/V Semiconductor Products	Ausgabe <i>Issue :</i> 2015-07-01
HNR 0064684-00	Thema: <i>Subject:</i> Recommendations for handling, stor- age and processing of III/V multi-junc- tion solar cells	T; Dr. Peper 2015-07-08 Q; Hr. Schilling 2015-07-22 S; Hr. Grein 2015-07-22

Handling and Storage

- GaAs on Ge solar cells contain harmful substances arsenic (As) and phosphorus (P) and shall be handled with care using appropriate hand protection (gloves). Handling tooling is necessary. Human consumption of cells, broken pieces and inhalation of dust may results in health problems and has to be avoided. In case of direct skin contact, hand washing is strongly recommended. In case of the cell breakage, cleaning up of contaminated parts is recommended.
- The use of vacuum tweezers for handling is recommended
- The cell shall be protected from humidity and moisture, which may cause oxidation and corrosion of Ge substrate and other parts of the solar cell (metallization, III/V-semiconductor materials, antireflective coating ARC).
- The cells shall be transported and stored in dry conditions. Outgassing of any substances from the storage package has to be avoided.

Processing

- The recommended interface material for interconnectors is gold or silver.
- Soldering process requires the use of silver-saturated solder to avoid dissolution of the cell metallisation. The soldering process temperature should not exceed 250°C for short time (about 1 min). The recommended solder material should be Sn96.5/Ag3.5 or any other suitable silver-saturated solder.
- Welding of interconnectors needs a specific set of parameter to avoid damage of epitaxial semiconductor stack.

- For mounting a secondary optics or a cover glass on top of the cell, flexible glue is required to avoid mechanical strain to the cell and, especially, to the metal fingers. This is true also for gluing to solar cells onto a substrate.
- For cleaning purposes, ethanol or isopropyl alcohol are allowed at dimmed light conditions. Different solvents in combination with light may induce voltage which could stimulate dendrite growth of the metallisation with a certain risk of shunts.
- Shearing force to the metal finger grid shall be avoided.
- Smearing metal over the cell edge is not allowed due to risk of the short-circuit.
- At any process- and operation condition, solar cells shall be protected from electrical discharge (ESD).