Screen printing of resists compatible with hydrofluoric acid

nb technologies
consulting engineers

Solar cell manufacturing concepts involving photo resist processes suffer from a complex process and high cost of lithography for patterning. Still, resist patterns can be beneficial or desired in advanced cell concepts or manufacturing sequences.
Due to the uniform print thickness, soft contact print with reduced force and the fine-line capability, **sunstence®** screens are well suited for screen-printable resist applications on solar cells.

Applications of resist

- Meander patterning in backside cell concepts
- Plating mould and nitride protection for plating approaches (direct plating or plating on Ag seed)
- Etch mask for wet chemical etching, e.g. for passivation layers
- HF compatible resists for nitride etching and patterned porous silicon formation
- **NEW** Selective emitter formation using resist mask and patterning

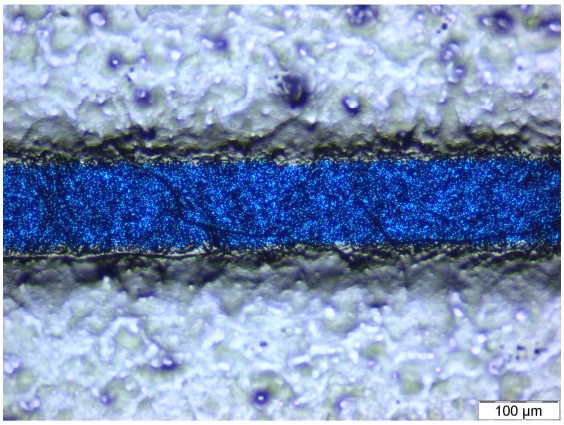
The major focus at NBT is to provide an etching and plating mask for direct plating metallisation concepts on silicon solar cells (patents pending). Direct-plated metallisation achieves the highest cost reduction and efficiency increase among plated metallisation approaches. Another aspect is to provide a solution which is available on the market with an established tool technology. Beside of the patterning aspect, the screen-printed resist mask solves the issue of undesired plating through porous nitride layers during the plating process, which is relevant to plating approaches in combination with silver paste seeds, too.

Maramask PV-HF

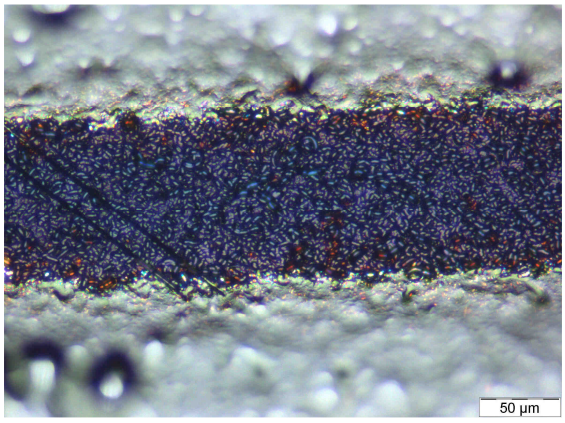
Marabu

Major benefits of screen printed HF-compatible resist

- no lithography or inkjet equipment needed, just available screen print technology
- protection during plating steps avoids the issue of undesired plating in porous nitrides
- compatible with hydrofluoric acid, acetone, ethanol, KOH
- suitable for wet-etch patterning of nitride and porous silicon formation in direct plating metallisation
- minimum line width presently ~40µm at ~15µm thickness



Screen printed, HF-compatible resist
nitride passivation layer not etched



Screen printed, HF-compatible resist;
porous silicon formed after HF-nitride-etch

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