TECHNICAL INFORMATION

Futurrex
Productivity Tools

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POSITIVE RESIST PR1-4000A1

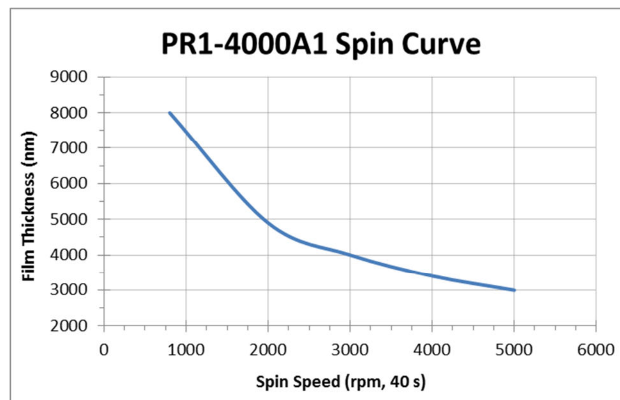
Description

- Positive Resist PR1-4000A1 is a positive tone photoresist designed for 365 or 436 nm wavelength exposure, using tools such as wafer steppers, scanning projection aligners, proximity printers and contact printers.
- PR1-4000A1 excels in applications when superior adhesion is required. Use of adhesion promoters, such as HMDS, is not recommended with PR1-4000A1.
- These are the advantages of PR1-4000A1 over other resists:
  - superior resolution capability
  - fast photospeed
  - superior linewidth control due to suppression of reflective notching
  - substrate adhesion which is superior to that of any commercial positive resist
  - ease of removal after RIE process
  - shelf-life exceeding 1 year at room temperature storage
- The formulation and processing of PR1-4000A1 were designed with regard to occupational and environmental safety. The principal solvent in PR1-4000A1 is 1-methoxy-2-propanol and development is accomplished in a basic water solution.

Properties

• Solids content (%)	36 – 40
• Principal solvent	1-methoxy-2-propanol
• Appearance	dark yellow liquid
• Coating characteristic	very uniform, striation free
• Kinematic viscosity at 23°C**	140 – 160 cSt

- Film thickness versus spin speed after bake on 120°C hotplate for 120 s



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- G-line sensitivity (436 nm) on Si substrate (mJ/cm² for 1 µm thick film) 40
- I-line sensitivity (365 nm) on Si substrate (mJ/cm² for 1 µm thick film) 70
- Guaranteed shelf-life at 23°C storage (years) 1

***For pump selections purposes, kinematic and dynamic viscosities can be considered numerically equivalent because the specific gravity of this product is close to 1 g/cm³.*

Processing

1. Application of resist by spin coating at selected spin speed for 40 s.
2. Application of Edge Bead Remover EBR1 to bottom and edge of the coated wafer for 10 s, until 5 s before completion of spin cycle.
3. 120°C hotplate bake for 120 s.
4. Resist exposure with a tool emitting 365, 406 or 436 nm wavelengths.
5. Resist development in Resist Developer RD6 by spray or immersion.
6. Resist rinse in deionized water until water resistivity reaches prescribed limit.
7. Drying of resist.
8. Removal of resist in Resist Remover RR41 at room temperature.

Note: The above procedure refers to substrates that are good conductors of heat such as silicon, GaAs, etc. Hotplate temperatures need to be adjusted so that surface temperatures of substrates that are poor conductors of heat reach designated temperatures for softbake and post-exposure bakes. Always use external thermocouples when measuring surface temperatures. For illustrative purposes, bake times need to be increased by a factor of 2 for substrates that are poor conductors of heat such as 0.7 mm thick glass.

Handling Precautions

Positive Resist PR1-4000A1 is a flammable liquid. Handle it with care. Keep it away from heat, sparks and flames. Use adequate ventilation. It may be harmful if swallowed or touched. Avoid contact with liquid, vapor or spray mist. Wear chemical goggles, rubber gloves and protective clothing.