

## P-I-01

### Positive Tone Polyimides Applying Chemical Amplification System

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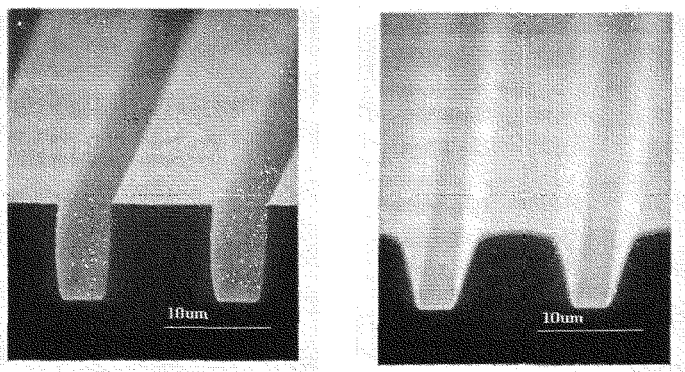
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In the application of polyimides as stress buffer coatings for microelectronic devices, there has been a steady trend in recent years from non-photosensitive polyimides to aqueous solution developable photosensitive polyimides (PSPI). The reason for this trend is the ability of aqueous photosensitive polyimides to simplify the fabrication process and reduce costs as well as addressing environmental issues.<sup>[1]</sup> One of desired properties for PSPI is the uniformity of pattern critical dimension (CD), in particular, in the case of so-called "one-mask" process where patterned polyimide film is used also as etching mask.

A property affecting CD uniformity is pattern profile. Gentle sidewall of pattern results in unstable CD uniformity of dry-etched patterns due to polyimide film loss at pattern bottom during dry etching. On the other hand, steep sidewall enables stable CD of dry-etched patterns by decreasing variation at dry etching process.

Conventional positive tone PSPI employing naphthoquinone diazide as photo active compound has gentle sidewall due to lower dissolution contrast. In this study, we report a study of positive tone PSPI applying chemical amplification system. The PSPI has steep sidewall of pattern with high dissolution contrast. We present lithographic performances and film properties of the PSPI.



**Figure 1.** Cross-sectional pattern profile of the positive tone PSPI based on chemical amplification system.

Left: pattern after development, right: pattern after cure.

1. *Recent Trend of advance Polyimide*, ST-Techno, 121(2004)