

# Future Prospects for Dry Etching

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In this presentation, We will give a general overview of plasma etching, including its basic mechanism, history, essential problem, and future development. We will also describe some potential post-plasma etching techniques.

The outline of our presentation is as follows:

**1. Plasma etching and the desired performance:**

The basic mechanism of plasma etching and the desired characteristics, such as anisotropic etching, a high etch rate, high selectivity, and low damage, are explained.

**2. Three-level structure of etching parameters:**

The essential difficulty in plasma etching development is described using the three-level structure of plasma etching parameters. This includes the apparatus, physical, and chemical parameters. Etching performance is decided by physical and chemical parameters. However, we cannot control these parameters directly, but only through the apparatus parameters.

**3. The development of plasma etching:**

The importance of developing new plasma production methods is explained here.

**4. Future trends in plasma etching:**

The following concepts are discussed in terms of developing future plasma production methods; the advantages and disadvantages of using a magnetic field, soft plasma, a power supply using wave-plasma coupling, source plasma and diffused plasma, three-dimensionally uniform plasma, and the importance of controlling chamber wall conditions.

**5. Post-plasma etching:**

Post-plasma etching must satisfy the low damage requirement at a higher level than the plasma etching. Thus, charge-free and/or low-energy processes are required for post-plasma etching.