

# Supply Chain Explorer

By the Emerging Technology Observatory

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## Dry etching and cleaning tools

Etching and cleaning tools have two main types: dry and wet. Dry etching tools—using gases to etch the substrate—are the most commonly used tool, and are especially necessary for circuit features in advanced chips. Dry etching tools have advantages over wet tools: they are fast and can etch differently depending on the direction of etch ("anisotropic etching"), which enables fine-grained features with complex shapes.

The most advanced dry etching tools are called atomic layer etching (ALE) tools. These tools are important for multiple etching applications in the most advanced chips, and are produced by leading U.S., Japanese, and British firms.