FUJIFILM

Specialty Etchants

- 1960 Aluminum Etch
- E6 Metal Etch
- 16:1:1:2 Aluminum Etch

•FUJIFILM Aluminum Etchants are immersion etchants for aluminum metallization layers.

• Their formulations offer etch rate latitudes of 2000 - 5000 Å/min between 40° and 50°C for aluminum-silicon films and 3000 - 6000 Å/min for aluminum films containing copper.

• Etch rates of aluminum films are primarily affected by etch composition and etch temperature.

• Typically a temperature between 35°C and 45°C is selected such that thin films (0.8-2.0µ) etch clear in 2 to 5 minutes.

• A minimum 10 second overetch after visual clearing is recommended to ensure complete isolation of features and removal of residual metal.

• Since the etch rate increases exponentially with increasing temperature, the slope of the curve will also increase with increasing temperature. For example, at 40°C, the etch rate of Al-1%Si-0.5% Cu will vary about 260 Å/min for each degree change in etch bath temperature. At 50°C, the etch rate will vary about 435Å/min for each degree change in etch bath temperature. Therefore, process latitude is greater at lower temperatures.

• In addition to etch composition and temperature, etch rate can be effected by agitation techniques, alloy type, and film impurities.

• The aluminum etch process produces hydrogen gas which tends to adhere firmly to the metal surface being etched. These gas bubbles can locally inhibit etching and result in non-uniform etching. Continuous agitation of wafers during etch facilitates the removal of this gas and allows fresh etchant to reach the surface.

•FUJIFILM has developed and patented a new surfactant specifically for use in aluminum etchants. The surfactant, AES (Aluminum Etch Surfactant), improves hydrogen gas dispersal and promotes uniform etching, helps reduce undercut, and will not filter out of solut ion like fluorocarbon surfactants.

• AES is available in all FUJIFILM aluminum etchants.

Figure 1. 1960 Aluminum Etch

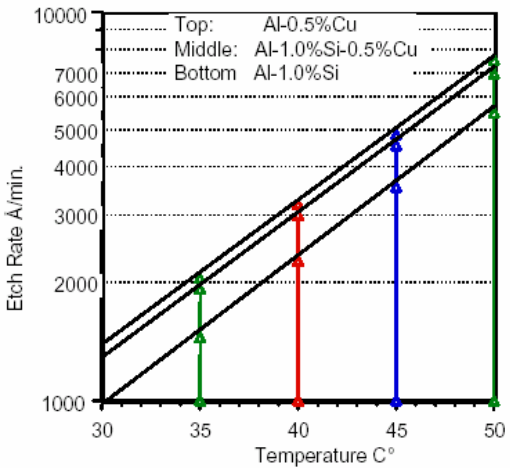

Figure 2. E-6 Aluminum Etch

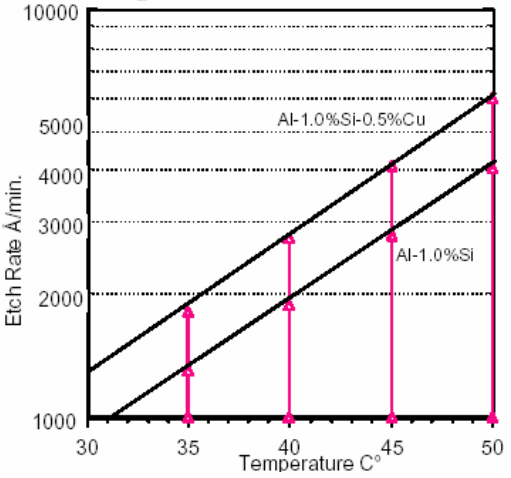

Figure 3. 16:1:1:2 Aluminum Etch