

those of the MRC foils and required much less polishing; final thickness after polishing was about 24  $\mu\text{m}$ . Electro-deposited silver foils from Goodfellow Metals Ltd. were also prepared. However, density and resistance measurements showed portions of the material to be as much as 30% porous. Shock resistance experiments were not performed on this material.

Mean grain size of Wilkinson foils was about 35  $\mu\text{m}$ , whereas that of the Materials Research Corporation foils was about 75  $\mu\text{m}$ . Orientation of crystallites in cold-rolled metal foils is not random; in silver the preferred orientation is with (110) planes parallel to the rolling plane and the  $[\bar{1}\bar{1}2]$  direction parallel to the rolling direction (Barrett and Massalski, 1966).

To polish the foils, a technique was needed to hold the foil piece flat and rigid during polishing. The technique developed was to bond the foil to a quartz glass plate with phenyl salicylate. These glass plates, 6.3 cm in diameter, were first bonded to aluminum plugs with Duco cement. Then the plugs with attached plates were heated on a hot plate to 45° to 50°C. The phenyl salicylate was then placed on the glass where it melted. Taking care to avoid dust particles, the piece of silver foil, 2.5 cm by 5 cm, was laid on the plate. A Mylar plastic sheet, a glass plate, and a brass plug weighing 700 grams were placed in that order on the foil. The assembly was then cooled to room temperature allowing the phenyl salicylate to recrystallize. The Mylar sheet was next peeled off and excess phenyl salicylate was scraped away.



Polishing was done on a Struers Company polishing wheel at 250 rpm; the plug was hand-held. The polishing sequence involved (1) 5 to 8 minutes using  $3\ \mu\text{m}$  alumina abrasive on billard cloth with distilled water as carrier; (2) about 2 minutes using  $0.05\ \mu\text{m}$  alumina on Microcloth (Buehler Ltd.). All parts were washed with detergent when switching abrasive grit size. Cloths were charged with abrasive by making a paste of distilled water and 2 to 3 heaping tablespoons of abrasive powder in a watch glass. This was then applied to the wet cloth with a finger. Care was taken to remove excess moisture from the cloth. After a polish was finished the foil was rinsed with distilled water and swabbed with cotton balls soaked in distilled water. It was then rinsed with ethanol and dried stain-free in a stream of warm air. The foil was removed by remelting the phenyl salicylate and then turned over; the polishing sequence was repeated on the second surface.

After both surfaces were polished, the foil was ready for cutting to the desired specimen shape and size (see Fig. 2a). A photo-etching technique was used to cut two specimens from each polished foil. The technique is reasonably simple to use and gives foils of accurate and reproducible dimensions. The technique is as follows: (1) the foil is coated with photo-resist solution and dried; (2) a negative template is placed over the foil and then the foil is irradiated with ultraviolet light (this sensitizes all photo-resist except that under the template); and (3) foil is placed in the photo-etch solution where chemical reaction erodes the parts of the