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January 7, 1955

TRIP REPORT

Destination: Schutte Optical Company
16 Dowling Place
Rochester, New York
Date of Contact: December 29, 1954
Report By: S. T. Jutila
Person Contacted: Mr. Schutte

Purpose of Trip: To obtain information on grinding and polishing glass pans and have Mr. Schutte supply us with samples for development work.

We have supplied Mr. Schutte with ten (10) ordinary household Pyrex pans with a flat bottom. He will grind the inside surface flat within plus-minus 0.001 inches and then grind the edges down w.r.t. and the inside surface to a height of 0.775 plus-minus 0.001. Also, Mr. Schutte will drill a round hole on the inside surface level in the inside corner for high voltage intake. These pyrex glass-pan samples should be ready for special delivery by January 12, 1955.

Mr. Schutte pointed out that round edged, flat inside surfaces, such as circular and elliptical glass pans with large corner radius can be ground and polished much easier than rectangular glass pans. There may be a possibility that he can handle ten to twenty per day. It is easy to grind edges with respect to the ground inside surface. In general, tolerances of the order of plus-minus 0.001 inches are not too difficult to achieve when one remembers that optical tolerances are in the neighborhood of two or three thousand angstroms.

For optical dimensions, certain strength of the glass piece is required. A rough estimate is given by thickness being one tenth of the diameter. However, for tolerances of plus-minus 0.001", this ratio of diameter to thickness may be of the order 30 - 40. Mr. Schutte demonstrated using Newton's rings the effect of bending on glass of different thickness and/or diameter.

Mr. Schutte had samples of ordinary glass, pyrex and optical glass. Pyrex had the most bubbles, internal fold, streaks, etc. It may not be possible to use Pyrex for glass pans although the physical and thermal properties may be better than those of other glass. One has to determine how coarse or streaky a glass pan could be from the optical point of view in television use.

The ordinary grinders are made for round symmetry. It may be possible to use cam type devices to produce elliptical or round cornered rectangular motions. The

grinding of cylinderical glass pans is very difficult and cannot be done near the edges. The grinding of edges, w.r.t. the flat inside surface, is easy and can be done within plus-minus 0.001 inches.

Holes with inside hemispherical bottom or conical walls can be drilled into glass. Diamond heads are used for this process. Such forms would not present too great a problem.

As a whole, it seems that the grinding and drilling of holes do not present any technical problems in principle. The question is rather that of economic limitation, it may be that the required tolerances may make an economic processing possible.

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