Cold Rolled Copper and 70-30 Alpha Brass

by Walter R. Hibbard, Jr.

IT has been proposed¹ on the basis of slip and flow that the ideal deformation texture of cold rolled face-centered cubic metals is (110) [112]. As pointed out recently by Brick,² this theory does not account for the difference between the pole figures for cold rolled copper and 70-30 alpha brass, which develop strikingly different spreads from the ideal orientations. It does suggest that the pole figures might be similar for these two metals if they are

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rolled sufficiently. This has been found to be the case for cold drawn wire.³

Experimental Procedure: Four inch sections of cast cakes of copper and 70-30 alpha brass were obtained through the courtesy of the Bridgeport Brass Co. Pieces from these cakes were cold straight rolled 99.993 pct reduction in thickness with the assistance of the Remington Arms Co., Bridgeport,

Conn., and by the use of pack rolling. Pole figures were made using the X ray camera and techniques described by Brick.⁴ These pole figures were not significantly different from those previously published for the same materials rolled 98 pct.⁵ Eight thicknesses of this strip were then pack rolled. This material failed completely and extensively in tension as shown in fig. 1, developing wavy transverse fractures and bulges. No further work could be done on these samples.

Summary: Within the range of this experiment, no attainable amount of cold rolling would cause the pole figures of cold rolled copper and 70-30 brass to become similar, in spite of the fact that such a similarity is predicted by theory.¹

References

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- ³ W. R. Hibbard, Jr.: *Trans. AIME* (1949) **185**, 598. *Jnl. of Metals*, Sept. 1949.
- ⁴ R. M. Brick: *Trans. AIME* (1940) **137**, 193.
- ⁵ R. M. Brick, D. L. Martin and R. P. Angier: *Trans. ASM* (1943) **31**, 675.

Fig. 1—Copper and 70-30 alpha brass cold rolled more than 99.993 pct reduction in thickness. (Actual size).