

The necessary requisites for the most efficient abrasive for grinding wheels are:

- 1st—Sharpness.
- 2nd—Hardness.
- 3rd—Right Temper.
- 4th—Uniformity.

ness and better temper, is necessary in the bonding of the grain into wheels in order to secure accurate and uniform results. Uniformity is necessary to secure constant efficiency of grade and temper in a wheel, so that wheels can be accurately duplicated

per for a certain kind of work. The term grade, as applied to wheels to designate the degree of hardness, is the resistance of the particles to the pressure employed in the act of grinding. A wheel from which the particles are easily broken is called soft while

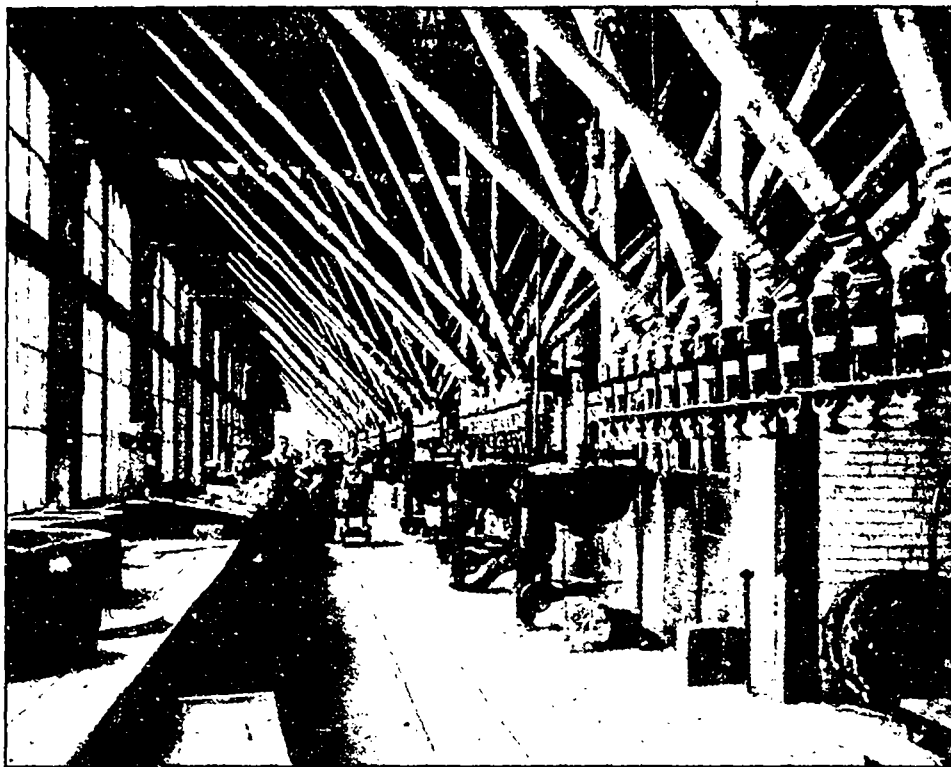


FIG. 3.—THE MANUFACTURE OF ABRASIVES.

In order to insure rapid and continued cutting so far as sharpness is concerned, a peculiar quality is necessary. There must be a fracture which will give a number of sharp-cutting points. This is obtained in alundum to better advantage than in any other abrasive material.

In the matter of hardness, the recognized standard is the diamond, which is the No. 10 in the scale of hardness; nothing that man has yet discovered or made equals the diamond in hardness. The term "hardness" is, therefore, a comparative term, the hardness of a mineral being ascertained by its ability to scratch another mineral of a known degree of hardness, or to be scratched by such a mineral.

Pure crystalline corundum, represented by the best sapphire or ruby, has always been the standard for No. 9 in the scale of hardness. This is readily scratched by alundum; in fact, alundum powder is used for cutting and drilling rubies and sapphires for watch jewels, etc.

By "temper" is meant its strength of grain and the character of its fracture under grinding pressure. An alundum grain is remarkably tough and will stand more crushing pressure before breaking than any other abrasive grain but when it does break it breaks with a sharp, conchoidal fracture, giving a fresh, keen-cutting edge. This is most important quality in an abrasive.

Purity, besides resulting in greater hard-

ness at any time and maintain their standard of work.

Uniformity is one of the most important

one which retains its particles longer is called hard. Wheels are graded from soft to hard depending upon the class of work on which



FIG. 3.—THE MANUFACTURE OF ABRASIVES.

requisites in an abrasive. The ability to they are used. Different grades of wheel duplicate grinding wheels is essential to obtain the best results. In grinding-wheels the abrasive grain of a given size is bonded together to produce a certain grade or temper. Different grades are required for different