

## THE MAINTENANCE OF CARBIDE TOOLS

It appears that in many shops the full benefits to be derived from the remarkable properties of these tools are still not being achieved, through failure to observe certain precautions in connection with their maintenance. The responsibility for this state of affairs does not lie with the suppliers of carbides, the majority of whom issue full instructions regarding the methods of application and treatment of such tools which have been found to yield the best results, while one, at least, has gone much further and established a school for the practical instruction of customers' employees. Much information on this subject, moreover, has already appeared in book form and in the technical press. Notwithstanding the availability of these data, there is evidence to show that faulty grinding is still a prevalent cause of trouble. Tool manufacturers in the U.S.A. have estimated recently that from 50 to 80 per cent of failures are directly attributable to *incorrect grinding* and it is probable that a survey of the British metal-working industries would yield a similar result.

The user who errs in this way certainly cannot plead, in extenuation, that his needs have been neglected either by the makers of tool and cutter grinding machines, or by the manufacturers of abrasive wheels and laps. Extensive study has been devoted to the peculiar requirements of carbides, and although there may well be further improvements, particularly in the field of abrasives, the quality of products now readily available, is such as to meet all practical requirements. It remains to ensure that the men responsible for tool maintenance are properly trained for this specialized work.

Even when the best equipment is installed, however, and tools are ground to the correct angles under conditions which minimize risk of overheating with consequent stressing or cracking, there is often a tendency to keep them in service for excessively long periods. Although carbide is extremely hard, and highly resistant to abrasion when suitably selected and applied, tools are not immune to wear. It is far more economical to remove them for sharpening as soon as the edges have become slightly dulled, rather than attempt to achieve uninterrupted runs of spectacular duration. Experience has shown, moreover, that it is frequently preferable to establish a definite tool life between successive grinding operations, expressed either in terms of time or number of components, than to rely on the judgment of the operator or tool setter.

As a general rule a carbide tool should be withdrawn from operation before a point is reached where more than 0.005 in must be removed from any face during subsequent sharpening, and it should certainly never be necessary to grind off more than 0.010 in. If tools are allowed to become excessively dull, valuable carbide is wasted, while its removal involves rapid wear of the silicon carbide or diamond wheels employed for grinding. Obviously, moreover, the more drastic the sharpening operation, the greater is the risk of cracking the tip. Apart from these considerations the use of dull tools increases the power required for machining operations and affects adversely the quality of the work produced. It is, of course, equally important that tools should be ground to the forms which have proved most suitable for particular operations, and here again an abundance of information is available. Similarly if the nature of the work is such as to demand the provision of chip-breaker steps or grooves they must be correctly shaped.

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