

CUTTERS

A total of five different cutters are available for the lathe duplicator and each cutter is supplied with a matching nylon follower tip which traces the profile of the template or pattern during duplication.

All of the cutters except the cone cutter are made of carbide and will stay sharp for many hours of turning. Refer to Chapter 24 for suggestions on touch-up honing and care. **Warning: Never attempt to grind these carbide cutters because the dust can produce eye and skin irritation as well as respiratory system and internal organ damage.**

The cutters are shown in Figure 13-8 and are described below:

1/2" Round Cutter-This is the best cutter for initial shaping. It is also very good for forming graceful curves, cove cuts and dishing.

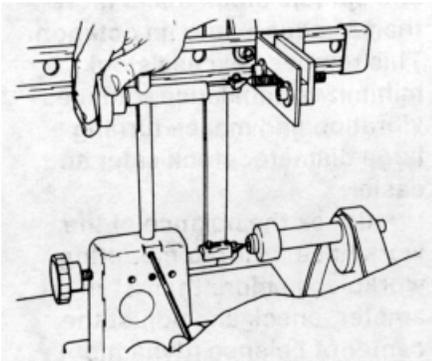


Figure 13-7. Align the follower to the cutter.

3/8" Square Cutter-The square cutter may be used for rough shaping, but it is best for turning square corners, grooves, short dowels, plugs and straight profiles. It is a good choice for forming tenons when making multi-section turnings.

35-Degree Diamond Cutter-Best for turning fine beads, deep grooves, sharp corners and intricate detail because the narrow tip allows greater penetration.

60-Degree Triangle Cutter-This is often considered the universal cutter because of its versatility. It produces good results in work ranging from rough shaping down to medium detail.

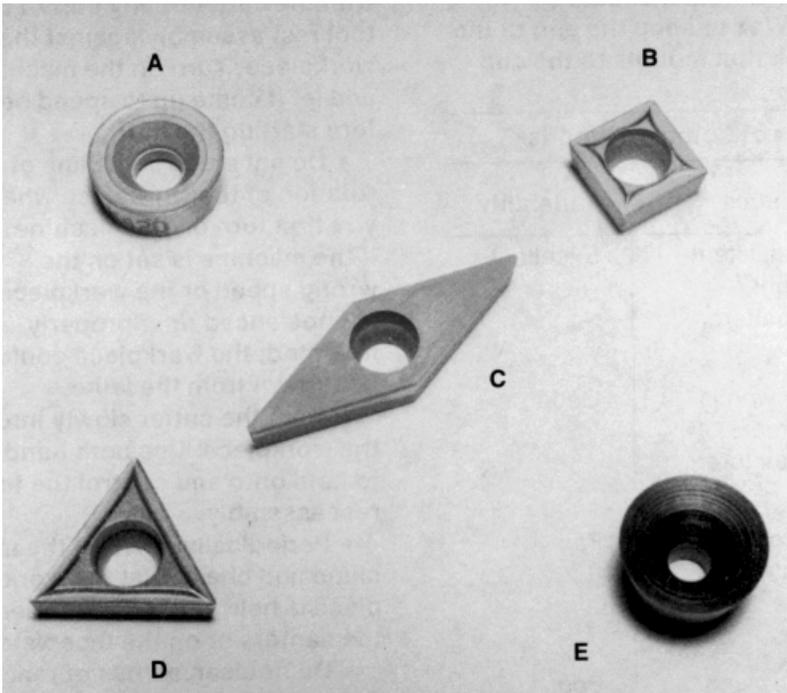


Figure 13-8. Five cutters handle a variety of profiles. (A) 1/2" Round, (B) 3/8" Square, (C) 35-degree Diamond, (D) 60-degree Triangle and (E) 1/2" Cone.

Normally the triangle cutter is mounted with the point facing the workpiece, however, it may also be used with a flat side facing the work if a square cutter is not available (Figure 13-9).

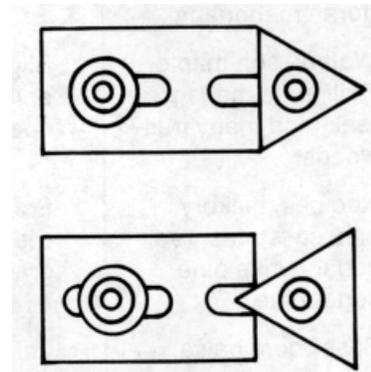


Figure 13-9. The triangle cutter can be mounted with the point or a flat side facing the workpiece.

1/2" Cone Cutter-The cone cutter is recommended for spindle turning only. It cuts quickly for rough shaping and is ideal for fin-ishing cuts when the shape of the turning permits.

The four carbide cutters cut with a scraping action and produce a somewhat rough surface. The cone cutter, however, is made of steel and has a sharpened edge which shaves the wood instead of scraping it away. This allows the cone cutter to cut faster and more smoothly, but the cutting edge will not last as long as the carbide cutters. **Warning: The cone cutter is not recommended for faceplate work because its sharp cutting edge tends to bite too deeply into the end grain of the workpiece.**

To get the longest life from the cone cutter, divide the tip into quarters and use one section of the cutting edge until it is dull. Then mark that section with a colored marker and rotate the tip 90-degrees to the next section. Sharpen or replace the cone cutter when the entire edge becomes dull.

TURNING CHARACTERISTICS OF COMMON WOODS

Because most lathe duplicator cutters cut with a scraping action, the density and grain structure of the wood will affect the quality of the turned surface and the amount of sanding required. Generally speaking, the best results will be achieved with very hard woods which have straight, even, closed grains. Softer woods or those with pronounced annual rings often chip, tear and feather and will re-quire considerably more sanding.

Refer to Table 13-1 to find the turning characteristics of various common woods.

Table 13-1: Turning Characteristics of Common Woods

Wood	Characteristics	Suitability
Beech, berch, cherry, hard maple, rosewood, ebony, Honduran mahogany	Very hard, consistent woods with tight, closed grain pattern.	Excellent
Walnut, soft maple, Philippine mahagony, teak, and many fruitwoods	Slightly softer woods or those with more open grain structure.	Good
Read oak, hickory, ash, sassafras, red cedar, white pine, sugar pine	Softer woods or those with open or stringy grain structure.	Fair
Basswood, balsa, cypress, redwood, yellow pine, western cedar	Very soft woods with open, stringy or irregular grain.	Poor

LATHE DUPLICATOR SAFETY

Warning: Before using the lathe duplicator, read and understand these important safety instructions:

- Wear proper eye and ear protection.
- Keep your hands, fingers and other parts of your body at least 2" away from the rotating workpiece until it is rounded.
After It is rounded, use caution when you get close to the rotating workpiece. Do not touch the workpiece as it turns.
- Keep the guard In place whenever you are performing turning operations. Position it not more than 1/2" from the workpiece.
- When turning glued-up stock, make sure the glue joints are strong. Glue the stock and leave it clamped for at least 24 hours prior to turning.
- Wear proper apparel. Never wear jewelry, gloves, ties, loose clothing or clothing with long sleeves. Keep long hair tucked under a hat. Jewelry, gloves, ties, clothing and hair could become entangled in the workpiece.
- When mounting stock between the centers, the spurs of the drive center and the cup of the tailstock center must penetrate at least 1/16" into the stock. Do not use a drive center or tailstock center if the point is damaged. The stock could be thrown from the lathe.
- Wax or soap the end of the stock that mounts to the cup center. This lubrication helps keep the center from wearing into the stock and causing the stock to loosen on the lathe. The ball bearing live center is highly recommended for use with the lathe duplicator.
- When mounting stock to a faceplate, use #12 x 1-1/4" long screws. The screws must penetrate at least 1" into the stock. The surface of the stock that's against the faceplate must be smooth and true.
- Cut faceplate stock round and spindle stock that's more than 3" square into an octagon. This removes excess stock, minimizes imbalance, reduces vibration and makes turning large diameter stock safer and easier.
- Check the balance of the workpiece. Prior to mounting workpieces more than 3" in diameter, check and adjust the center of balance (dynamic center). Unbalanced workpieces could be thrown from the lathe.
- Do not turn on the power with the cutter or any part of the tool rest assembly against the workpiece. Turn on the machine and let it come up to speed before starting the cut.
- Do not stand In the line of rotation of the workpiece when you first turn on the machine. If the machine is set on the wrong speed or the workpiece is unbalanced or improperly mounted, the workpiece could be thrown from the lathe.
- Feed the cutter slowly into the workpiece. Use both hands to hold onto and control the tool rest assembly.
- Periodically, turn off the machine and check that the workpiece is held securely between the centers or on the faceplate.
- Do not lean across or reach underneath the lathe while it is running.
- Do not try to stop the lathe by grabbing the stock or any part of the machine. Do not part the stock completely or turn the spindle down to such a small diameter that it snaps on the lathe. This can be extremely dangerous.
- Do not turn stock with splits, loose knots, or other defects that could cause the stock to break, splinter or come loose while turning. Never turn second-hand lumber. If you hit a nail or screw, you could be hit by pieces of metal.
- Remove the lathe duplicator components from the Mark V before sanding or finishing a workpiece on the lathe.