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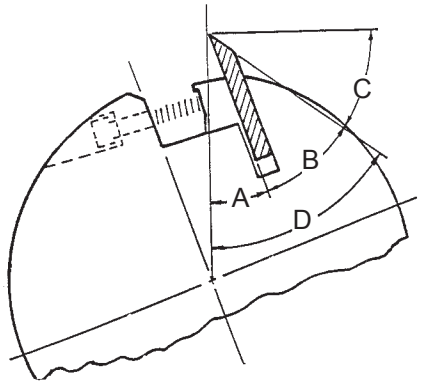
BASIC TOOLING TERMINOLOGY

(Glossary Of Terms)

TORN GRAIN is caused by insufficient cutting thrust or by cutting into the grain in an unfavorable direction. It is a defect below the planed surface.

FUZZY GRAIN caused by too small a hook angle in a soft wood. It is a defect above the planed surface.

INSUFFICIENT CUTTING THRUST causes torn grain or rough finish quality. Experience has shown that a hook angle of 22° is excellent for soft wood machining. A hook of 10° is excellent for hard wood machining. Since many mills use both hardwoods and softwoods a hook angle of 15° is recommended. If a slightly different hook angle is desired this may be accomplished by either extending the knife further out of the head or by back grinding the knife. Back grinding is done by face grinding the knife. After this is done you must then reprofile the knife so that the pattern will not be distorted.



Basic Guidelines

A	Cutting Angle (Hook Angle)
B	Wedge Angle (Blade Angle)
C	Clearance Angle
D	Sharpness Angle

SMALL CUTTING ANGLES tend to reduce torn grain.

LARGE CUTTING ANGLES tend to reduce fuzzy grain.

BLADE ANGLE Primarily determines the rigidity and lifetime of the tooling. The bigger the angle, the longer the knife's lifetime between sharpenings. A large blade angle combined with high quality tooling steel helps in avoiding chipped edges. When the edge of a knife chips, usually caused by cutting into a foreign substance, it leaves a raised streak in the stock after planing. The smaller the blade angle, the more material has to be ground off for a particular profile. More grinding time is involved which is unfavorable for short runs. Knives used in jointed heads are ground with a jointed small blade angle so that more joints can be done with less land left, thus increasing productivity. A dull knife makes itself pull hard, increases vibration and pounding and tends to produce fuzzy grain.

Clearance Angle Recommendations

Soft Woods	Clearance Angle	Hard Woods
33°	Rough Back	25-27°
10°	Rough Side	5°
27-30°	Finish Back	22-24°
5°	Finish Side	2.5°

BACK CLEARANCE ANGLE Makes sure that only the lead edge of the knife is in contact with the lumber. This allows the metal behind the lead edge to run clear of the lumber. The air flow behind this lead edge on a knife keeps the blade cool while it is in operation thus preventing burn marks. The bigger the clearance the better the cooling effect and the less pitch buildup.

SIDE CLEARANCE ANGLE Used for profile knives on side cuts to reduce drag. Side clearance should be used on most profiles but must be used on knives with 55° or more angle. Otherwise, the knife gets dull very fast on the side flanks and burn marks will appear at these points.

CUTTING ANGLE The combination of hook angle and blade angle basically determine the surface quality of the lumber.