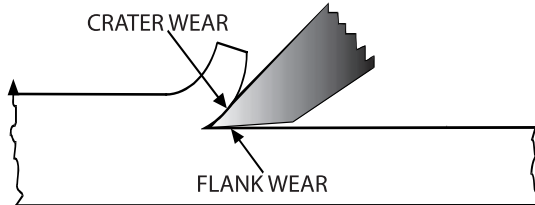


TOOL WEAR

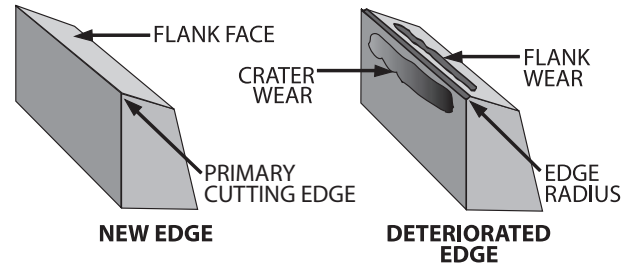
GENERAL TOOL WEAR DEFINITIONS

FLANK WEAR – Clearance or relief side of the edge is wearing or rubbing. This is how most router bits wear. Clearance side of the cutting edge should rub a little for controlling feed and vibrations during a cut.



CARBIDE WEAR

- SOLID CARBIDE BITS ARE MADE OF
 - 4%-16% COBALT (CO)
 - 80%-96% TUNGSTEN CARBIDE (W)
 - TRACE AMOUNTS OF "SPECIAL SAUCE"
- COBALT ACTS AS A BINDER OR "GLUE" FOR THE MATERIALS
- COBALT IS VERY REACTIVE. IT WOULD MUCH RATHER BOND WITH OTHER REACTIVE SUBSTANCES THAN WITH CARBIDE, THIS IS CALLED ATOMIC TRANSFER OR HOT CORROSION.

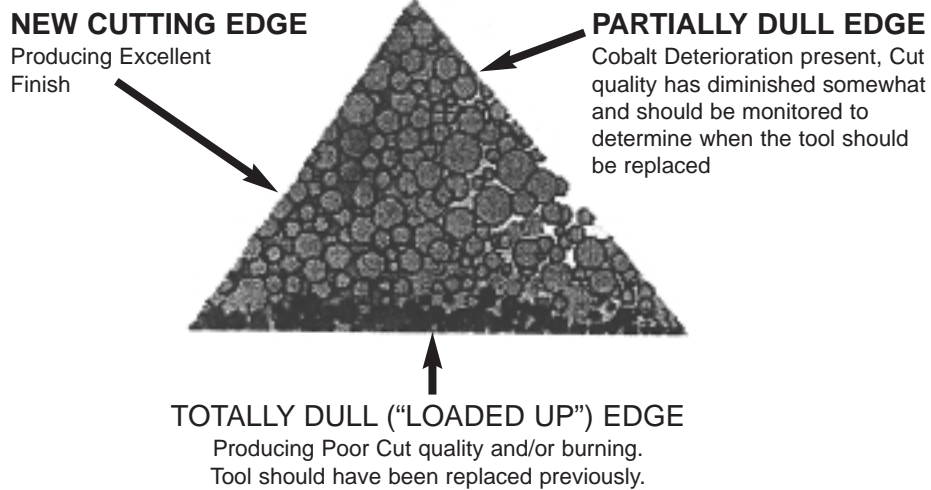


CRATER WEAR – Rake face side of the tools edge is wearing. Normally this is due to a very abrasive material flowing over the surface of the rake face. This is very rare in routing. However, with greater and greater chip loads, this may become more of a factor.

EDGE RADIUS – Localized wear of the very tip of the tool edge. This is really a combination of both of above but concentrated on the very edge.

CATASTROPHIC FAILURE – Chipping or breakage due to hitting something harder than the edge material or the tool and/or edge was too weak for the geometry or application of the tool.

THE DULLING PROCESS OF CARBIDE



Edge deterioration is due to hot corrosion of atomic transfer of the cobalt binder at the surface of the cutting edge. Heat generated during the process causes this phenomenon. Hot corrosion can not be halted, but creating larger chips during

the machining process may substantially slow it. Since the formation of chips is a function of feeds and speeds, it is critical to understand the concept of chip formation and how it reduces heat.