

Cutting Tool Materials

Mechanical Engineering

Hardness against toughness, and which tool suits which cut.

Harder cuts faster; tougher survives interruption. You trade one for the other.

Material	Use for	Note
High speed steel	Low speed, complex forms	Tough and regrindable
Coated carbide	General production work	The modern default
Cermet	Finishing steel	Fine finish, brittle
Ceramic	Hard turning, cast iron	No coolant, no shocks
Cubic boron nitride	Hardened steel	Costly, very long life
Polycrystalline diamond	Aluminium, composites	Never on ferrous metals

Diamond dissolves into steel at cutting temperature, so diamond tooling is for non-ferrous work only.