

Engineering Data

• **Materials Listing** • **Suggested Surface Treatments**
Cutting Fluids and Cutting Speeds
(STARTING SFM RECOMMENDATIONS ONLY)

MATERIAL TO BE TAPPED	SUGGESTED SURFACE TREATMENT**	LUBRICANT/COOLANT	HSS SPEED / SFM	CARBIDE SPEED / SFM
ALUMINUM (WROUGHT)	TiN, TiCN	Soluble, Light Base, or Lard Oil	90-150	100-250
ALUMINUM DIE CASTING	TiCN, TiN, CrN, TiAlN+WC/C	Soluble or Lard Oil	65-75	75-100
ALUMINUM BRONZE	N, TiN	Mineral Oil w/Lard, or Light Oil	20-60	40-80
BAKELITE (HARD PLASTIC)	TiCN	Dry or Air Jet	25-40	25-40
BERYLLIUM COPPER	TiAlN+WC/C, CrN, N	Soluble Light Base Oil	50-90	50-90
BRASS	None, TiCN	Soluble Light Base Oil	100-200	100-200
BRONZE (FREE-MACHINE)	None, TiCN, N	Soluble Light Base Oil	80-150	100-200
CAST BRASS	N, TiCN	Soluble Light Base Oil	100-200	125-250
CAST IRON (GRAY)	N, TiCN	Dry or Soluble Oil	20-80	40-100
COPPER	TiAlN+WC/C, CrN	Soluble Light Base Oil	80-150	100-200
COPPER-NICKEL	N, TiCN	Soluble Light Base Oil	10-20	20-50
DELTRIN	TiAlN+WC/C, TiN, N	Dry, Air Jet, or Water Soluble	65-100	65-100
DUCTILE IRON	N+O, TiN, TiCN	Soluble or Sulphur Based Oils	30-50	40-80
DURALUMIN	TiAlN+WC/C, CrN	Soluble or Lard Oil	50-90	50-90
FERRO-TIC	None	Anti-Seize Compound	8-20	8-20
FIBERGLASS	TiCN	Dry or Air Jet	25-40	30-60
HASTELLOY	CrN	Sulphur Based Oils	8-20	8-20
INCONEL	N, CrN	Sulphur Based Oils	8-20	8-20
MAGNESIUM	CrN	Soluble Light Base Oil	100-150	100-150
MALLEABLE IRON	N+O, TiN, TiCN	Soluble or Sulphur Based Oils	30-50	30-50
MANGANESE	TiCN	Sulphur Based Oils	8-20	8-20
MANGANESE BRONZE	N, TiCN	Soluble Light Base Oil	20-60	40-80
MOLYBDENUM	N, TiN, TiCN	Sulphur Based Oils	20-45	30-60
MONEL	N, TiCN	Sulphur Based Oils	8-20	15-40
NAVAL BRASS	N	Soluble Light Base Oil	100-200	100-200
NAVAL BRONZE	None, TiCN	Soluble Light Base Oil	80-150	80-150
NICKEL SILVER	N, TiCN	Sulphur Based Oils	20-60	20-60
NICKEL (PURE)	N, TiCN	Soluble Light Base Oil	5-25	10-40
NITRALLOY	N, TiCN	Sulphur Based Oils	8-20	8-20
NITRONIC (* NO GUARANTEE)	N, TiN, TiCN	Sulphur Based Oils	8-20	8-20
NYLON	N, TiN	Dry, Air Jet or Water Soluble	65-100	65-100
PLASTICS:				
THERMOPLASTIC (SOFT)	N, TiN	Dry, Air Jet or Water Soluble	65-100	65-100
ABS, DELTRIN, NYLON, PVC, ETC.				
THERMOSETTING (HARD)	TiCN	Dry or Air Jet	25-40	25-40
BAKELITE, LAMINATES, PHENOLIC, POLYESTERS, ETC.				
POWDERED METAL (Sintered)	TiCN	Soluble Light Based Oil	25-80	25-80
RUBBER, HARD	None	Dry	50-200	50-200
SILICON BRONZE	N, TiCN	Soluble Light Base Oil	20-60	20-60
STEEL:				
CARBON STEEL	O, N, TiN	Sulphur Based Oils	40-90	50-120
COLD-ROLLED STEEL (1018, etc.)	O, N, TiN	Sulphur Based Oils	40-90	50-120
FORGED	O, N, TiN	Sulphur Based Oils	20-50	30-75
LEADED (12L14, etc.)	O, N, TiN	Sulphur Based Oils	40-90	50-125
STAINLESS:				
FREE MACHINING	N, TiN, TiCN	Sulphur Based Oils	20-40	40-80
PRECIP. HARDENING	N, TiN, TiCN	Sulphur Based Oils	8-20	10-30
TOOL STEEL	N, TiN, TiCN	Sulphur Based Oils	20-50	30-65
TITANIUM	O, N, CrN	Sulphur Based Oils	20-50	30-65
TUNGSTEN	TiN	Sulphur Based Oils	8-20	8-20
TURCITE (SOFT PLASTIC)	N, TiN	Dry, Air Jet or Water Soluble	65-100	65-100
ZAMAK (ZINC DIE CAST)	TiCN, TiN, CrN, TiAlN+WC/C	Soluble Light Based Oil	50-200	50-200
ZINC	TiCN, TiN, CrN, TiAlN+WC/C	Soluble Light Based Oil	50-200	50-200

* If problems are encountered when tapping nitronic, or any other material (listed or not), please consult the factory.

** See page 79 for definitions of surface treatment abbreviations.

Note: The SFM cutting speeds listed are starting SFM recommendations only and depending on specific tapping conditions, may have to be altered. Allen Benjamin assumes no responsibility or liability of any kind as a result of the above listed SFM recommendations.

