

CRAFTSMAN CRIBSHEET

ISO Material Groups: Nonferrous

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Nonferrous is such a large group that each one of these could be their own cribsheet. This list is a good starting point for understanding how to determine suitability for various applications. ISO Material Groups are what we use

for identification of material we are cutting with carbide inserts. The aluminums listed below will also be broken down between hardenable and nonhardenable grades.

N	Nonferrous – Aluminum, Copper, Brass, Plastics	Hardness (HB)	Hardness (HRC)
N1	Wrought Aluminum – The most common aluminum in machine shops. Machinability Range: 170-300% Examples: 6061, 7075, 2024, 2011	~60-100	–
N2	Low Silicon Aluminum – Also known as Hypoeutectic alloys having silicon content of less than 12%. More abrasive than wrought. Machinability Range: 50-100% Examples: 8090, 4015, A05150, A356, A03650, A13600(A360.0)	~75-90	–
N3	High Silicon Aluminum – Also known as Hypereutectic alloys having silicon content of greater than 12%. Very abrasive on cutting edges. Used in high friction environments like pistons. Machinability Range: 10-70% Examples: A03900, A13900, A393, 4032-T6	~130	–
N4	Copper, Brass and Zinc Based Alloys Machinability Range: 100-300% Examples: C36000, C37000, C93200, C83600, C46400, C86400, C11000, C18100	~90-120	–
N5	Nylon, Plastics, Rubber, Phenolics, Resins, Fiberglass – Most alloys are relatively free machining. Glass filled plastics are abrasive on cutting edges. Machinability Range: 150-300% Examples: Peek, Nylon 6, Bakelite, Phenolic, Teflon	~55 Shore D -70 Shore D**	–

*Machinability is a percentage of 1212

**Plastics mentioned in this article are measured on the Shore D scale not HB.

Find a grade specific material in a reference manual to get surface feet per minute (sfm) with high strength steel (HSS). Multiply the HSS number by 2 - 2.5 and it will provide a reference point for what sfm you should use with carbide. The sfm guidelines given based on material groups above can vary widely, which can be seen in the machinability range. **P**