


Machinability of Steel

“Machinability” is a relatively broad term, subject to many definitions, but in general can be thought of as the ease with which a metal may be machined. Most definitions include reference to:

- tool life
- surface finish
- machining speed
- energy or power required

The following table is based on S.A.E. 1112 steel which is considered to be 100% machinable. The table is a general look at various alloys - it must be remembered that factors such as micro-structure, hardness, work-hardening, chemical composition, etc., exert a very definite influence on the machinability of the metal, changing the cutting characteristics of any one particular operation as much as 50%.

Relative Machinability of Various Alloys

Machinability	Ferrous	Nonferrous
Excellent  Unmachinable		Magnesium alloys
		Aluminum alloys
		Leaded brass
		Zinc alloys
	Leaded steel screw stock	
	Low-carbon steel screw stock	Silicon-bronze
	Ferritic malleable cast iron	Leaded phosphor-bronze
	Pearlitic malleable cast iron	
	Ferritic gray cast iron	Yellow brass
	Free-cutting 12% Cr iron	Cast copper
	Low alloy steels	Nickel
	Ingot iron	
	Wrought iron	
	Free-cutting 18-8 stainless steel	
		Monel metal
	Austenitic manganese steel	
	High-speed steel	
	18-8 Stainless steel	
	White cast iron	
	Stellite	
	Sintered carbides	

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