Presenting: a Small Dose of Material Science

MELTING POINTS OF METALS (in alphabetical order)

(see the notes on the reverse for qualifications to these temperatures)

Aluminum	1221°F	Iron	2800°F
Aluminum-copper alloys (10)	1922°F - 1940°F	Lead	622°F
Aluminum-Copper		Nickel	2651°F
accidental alloys (11)	1019 - 1985°F	Silver	1763°F
Brass (commercial alloys) (4)	1652 - 1904°F	Solder, lead-tin (12)	361 - 415°F (typical)
Brass (accidental alloys) (5)	788 - 1985°F	Steel, typical structural, (14)	2760°F
Bronze (Phosphor Bronzes) (6)	1868°F - 1958°F	Tin	450°F
Bronze (accidental alloys) (7)	450°F - 1985°F	Tungsten	6192°F
Copper	1985°F	Zinc	787°F

IGNITION TEMPERATURES OF VARIOUS MATERIALS

(All ignition temperatures are approximate, see note #1)

ABS (plastic) (8)	871°F	MAPP, or MPS (2)	850°F
Acetone	869°F	Methane	999°F
Acetylene	581°F	Methyl alcohol (methanol)	867°F
Asphalt (typical)	905°F	Melamine, glass fiber laminate	1153 - 1193°F
Asphalt shingle	712°F	Natural gas	900 - 1170°F
Benzene	928°F	Nylon 6 and 6/6	590 - 716°F (decomposes)
Butane	550°F	Nylon, various	795 - 990°F
Butane, Commercial	900 - 1000°F	Paper (15)	425 - 475°F (typical)
Carbon Disulfide	194°F		405 - 700°F (extremes)
Carbon Monoxide	1128°F	Paraffin Wax	473°F
Charcoal	300 - 480°F	Peanut Oil	833°F
Corn Oil (for cooking)	740°F	Plywood, plain 1/4" or ½"	734°F
Cotton flannel (15)	465 - 547°F	Propane	842°F
Ethyl alcohol (ethanol)	685°F	Propane, Commercial	920 - 1120°F
Fuel Oil #2	494°F	Polycarbonate	891 - 1076°F
Gasoline, 56-60 octane	536°F	Polyethylene	660°F
Gasoline, 100 octane	853°F	PVC (polyvinyl chloride)	392 - 572°F (decomposes)
Gasoline, 100 - 130 octane (3)	824°F	Soy Bean Oil	833°F
Gasoline, 115-145 octane(3)	880°F	Stoddard Cleaning Solvent	444°F
Glass, soda-lime-silica (13)	1300°F–softening point	Turpentine	488°F
	1300 - 1800°F– forming range	Wood (9)	356 - 752°F
	2200 - 2750°F– melting range	Wool (15)	431 - 498°F
Hardboard, 1/4"	568°F		
Hydrogen	932°F		
Kerosene (Fuel Oil #1)	410°F		
Linen (15)	441 - 508°F		

Rev E – alpha

(Please see reverse for reference notes to the above temperatures.)

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Notes to Melting and Ignition Temperatures

(1) Ignition temperatures depend on the test conditions, e.g. percentage of gas or vapor in the mixture, the shape and size of the vessel, the rate and duration of heating, the presence or absence of very small amounts of catalytic materials and other subtle factors. Variations in ignition temperatures of more than 100°F for a single material have been reported for different test conditions.

(2) Methylacetylene and propadiene (stabilized) which is marketed as MAPP or MPS brazing/welding gas.

(3) Aviation grades of gasoline.

(4) Most commercially useful brass (Copper + Zinc) alloys have melting points in or close to this temperature range.

(5) Accidental Copper + Zinc alloys, such as those found at a fire scene may have a melting point anywhere in the wider range.

(6) Phosphor bronze alloys (Cu + Sn), such as those frequently used in electrical switches have melting points in or close to this temperature range.

(7) Accidental alloys of Copper + Tin may have a melting point anywhere in the wider temperature range.

(8) Acrylonitrile-butadiene-styrene

(9) The ignition temperature of wood is profoundly affected by the test conditions and the duration of heating. The temperatures cited are for exposure periods of 30 second to 40 minutes; much lower ignition temperatures have been observed for exposure intervals measured in months or years.

(10) Many commercial Aluminum + Copper alloys are called "aluminum bronze".

(11) Accidental alloys of aluminum and copper may have melting points lower than the melting point of either constituent (1019°F at 67% Al, 33% Cu).

(12) Lead Tin alloys (the traditional "solder") generally have melting points in this range. "Silver solders", with Ag, and possibly other elements, may have much higher melting points, e.g. in the 1200 - 1300°F range.

(13) Soda-lime glass is the most frequently encountered glass. It does not have a sharp melting point; the forming range is the temperature range where it can readily be molded or blown. It can be poured when in the melting range. Specialty glasses may have much higher softening, working and melting temperature ranges.

(14) Typical low carbon structural steel. The properties of high alloy or specialty steels may be quite different.

(15) Untreated fabric; ignition temperature is dependent on rate of temperature rise, air flow, etc.

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