

## Properties of Natural Resins

Resin	Source/type	Melting point (°C)	Density	Ref. Index	Acid number	Saponification number	Solubility	Characteristics	Uses
amber	fossil resins	250-325	1.05-1.1	1.54 - 1.55	15-35	115-225	Amber is very resistant to acids and alkalis and is not entirely soluble in any solvent	yellowish, hard, glassy, fossil resin; Mohs hardness = 2.5-3.0; Succinites emit succinic acid when heated; fluoresces a strong yellowish green to bluish white in short-wave UV light	carved for jewelry, beads, amulets, and small vessels; used as an ingredient in paint and oil/amber varnishes are made by dissolving melted amber in amber oil, turpentine oil, or a drying oil.
copal	diterpenoid resins from <i>Trachylobium</i> species (Africa), <i>Hymenaea courbaril</i> (South America) and <i>Agathis australis</i> (New Zealand).	180-340	1.04-1.13	1.528-1.545	122-128	132-178	After melting, copals are soluble in oil and turpentine. Soft copals are partially soluble in ethanol, chloroform, glacial acetic acid.	May fluoresce white in short-wave UV	varnishes for coaches, linoleum, oilcloth, amber substitute
dammar	driterpenoid resin from Dipterocarpaceae trees in southeast Asia of the genera <i>Shorea</i> , <i>Balanocarpus</i> , or <i>Hopea</i>	90 (softens); 100-180 (melts); Tg =39.3	1.04-1.12	1.515 - 1.539	16-18	20-65	Soluble in turpentine, oil, chloroform and aromatic hydrocarbons	Darkens with age. Turns cloudy when moisture is present during preparation	picture varnish, printing ink, mounting thin sections, alkyd baking enamels, paper and textile coatings
elemi	from trees of the family Burseraceae	77-121			17.8-25	25-50	Soluble in ethanol, ether, chloroform, benzene. Insoluble in water, turpentine and mineral spirits.	Soft, sticky, odoriferous resin	plasticizing additive in varnishes; lithographic inks, paper and textile coatings, perfume bases, waterproofing
mastic	triterpenoid resin from mastic shrub, <i>Pistacia lentiscus</i> , in southern Europe and northern Africa	95-120; Tg =34.7	1.074	1.535-1.536	50-71	82-92	Soluble in oil, turpentine, ethanol, diethyl ether, benzene, acetone, chloroform	Darkens and become less soluble with age. May turn cloudy if moisture is present during preparation.	picture varnish, additive in oil media; printing ink, chewing gum
rosin	oleoresinous exudate from Coniferae trees (longleaf pine ( <i>Pinus palustris</i> ), Cuban pine ( <i>P. caribaea</i> ), loblolly pine ( <i>P. taeda</i> ), cluster pine ( <i>P. pinaster</i> ), or Scotch pine ( <i>P. sylvestris</i> ))	100-150	1.07-1.10	1.525-1.548	150-180	150-200	Soluble in ethanol, acetone, turpentine, acetic acid, carbon disulfide	Oxidizes easily and may blacken with age. Combustible, burning with a yellow, sooty flame.	paints, varnishes, inks, adhesives, sealing wax, soldering fluxes, and linoleum. Also used to increase sliding friction on musical instrument bows and dance floors
sandarac	from the alerce tree <i>Callitris quadrivalvis</i> native to Australia and the sandarac tree <i>Tetraclinis articulata</i> native to northern Africa	135-150	1.078-1.088	1.545	140-155	143	Soluble in ethanol, ether, acetone, amyl alcohol and hot alkali.	Brittle	spirit and oil varnishes
shellac	excreted by the female of the lac insect, <i>Laccifer lacca</i> , native to India	115-120	1.035-1.140	1.516	48-64	185-213	Fresh shellac is soluble in ethanol, acetone. Shellac becomes insoluble with age	Iodine number = 10-18; unbleached shellac will autofluoresce orange; moisture can produce a white haze on dried surface	furniture polishes, protective coating for plaster molds, composition products; gramophone records