

Scope This document is intended as a brief description of the common solvents you will run across in making models and working around the shop. It is based solely on my experience; I have not looked at the MSDSs for or researched the chemistry of the various solvents.

General Technically, a solvent is the material in which a solute is dissolved. Using watercolors as an example, the pigments are solutes and water is the solvent. A more common terminology is the word base as in water-based, or oil-based. All you really need to understand about this is that if you know the base of whatever finish you are using, you know what solvent to use to thin the finish or clean up your brushes. Be aware, however, that some finishes change chemically as they cure so that once dry they are no longer affected by their solvent base. Water-based spray paints are an example of this.

In addition to working with finishes, you will use solvents for general clean up and degreasing. When doing so, try to find the most benign solvent that will do the job.

Safety Except for water, all the solvents discussed below have negative health affects. They are poisonous if swallowed, noxious if inhaled, and irritating if left in contact with your skin. Take your normal common sense precautions when using them: wear gloves and a respirator, work only with good ventilation, and immediately wash with soap and water after using them.

Solvents The following list is arranged roughly in order from nicest to nastiest.

Water

Water is the most common solvent. It is also the only one that is totally benign. Therefore, even if you have to use some other solvent to accomplish a task, you should always do your final clean up with soap and water. That means not just washing yourself, but also your project, and the area where you have been using the other solvent.

Although most fine finishes use organic or petroleum solvents, more and more paints and finishes are available in water-based formulas. Be warned that in some cases these newer alternatives are inferior to the older more toxic formulas. They can be harder to apply, dry more slowly, or simply not perform as well. Hopefully, this will change as legislation and attitudes continue to force manufacturers to develop better, safer products.

Alcohol

Alcohol is a more effective degreaser than plain water. It is also used as the solvent for some markers. There are two common types of alcohol: ethanol which we drink, and methanol, or wood alcohol, which is metabolized into formaldehyde so can cause blindness if swallowed. De-natured alcohol is ethanol with some methanol added so that it can be sold as a solvent rather than a beverage.

Acetone

major component (other than scent) in nail polish remover, so one can assume it is reasonably non-toxic.

Paint Thinner or Mineral Spirits

As near as I can tell these two are the same thing. They are a petroleum distillates which means that they are chemically related to oil and gas. They feel oily. Use the odorless versions. This is the solvent of choice for oil-based paints.

Kerosene

Another, slightly heavier, petroleum distillate. You won't use this for clean up, but I mention it here because I have found it to be an excellent lubricant for cutting and machining plastics like acrylic and polycarbonate. I also use it for wet sanding these plastics. Because it is basically a very light oil, it can be used on the equipment in the shop without risk of dissolving the lubrication in their bearings and slides.

Methylene Chloride

This is the solvent for acrylic. You can use it to bond acrylic instead of cyanoacrylates. It produces optically clear joints if done carefully, and because it evaporates, leaves absolutely no residue. You can buy so-called acrylic solvent but it is basically methylene chloride with additives like propylene glycol to increase viscosity.

Bestine

This is the brand name solvent for rubber cement. It is xylene.

Lacquer Thinner

Definitely the nastiest player on this list, lacquer thinner is a smorgasbord of bad ass stuff. The exact ingredients will vary by manufacturer but expect to find petroleum distillates, alcohol, toluene, acetone, methyl ethyl ketone, propylene glycol, monomethyl ether acetate, ethyl acetate, and xylene.

Because it contains a number of toxic components use lacquer thinner for thinning only when it is explicitly called for, as with lacquer paint. Use it as a degreaser only after you have found that acetone won't work.