This manual will outline the hazards of certain materials and will offer alternatives to toxic painting practices. All effort has been made to keep this document up to date with new non-toxic products and innovations as well as rediscovered traditional practices.

It is in the artists best interest to be informed of the toxic hazards of their medium and how to use their materials safely and securely. We expect that part of your education will be in retaining this information.
We don’t have to look back far to find the effect toxic materials has had on the Arts community. One of Bay Area’s most notable painters, Jay DeFeo, died at the age of sixty due, in large part, to her exposure to lead paints. Many artists of her day did not know what was in the materials they were using. In fact, manufacturers were not required to disclose that information until, for the first time in 1984, California legislation was introduced forcing manufacturers to reveal the health hazards within their products.

The health hazards associated with painting and drawing have been known since Ramazzini described them in his book, *De Morbis Artificum Diatriba*, in 1713. Working safely can involve changes in how you select your art materials, how you handle and dispose of them. Though there is a better consciousness of one’s materials today there still persists a disregard of the dangerous effects of some materials. Painting materials have been highly regulated in recent years but there are still hazards to be aware of and try to avoid or minimize.

Though there is a better consciousness of one’s materials today there still persists a disregard of the dangerous effects of some materials. Painting materials have been highly regulated in recent years but there are still hazards to be aware of and try to avoid or minimize.

<table>
<thead>
<tr>
<th>Non-Toxic Painting</th>
<th>Toxic Painting with Solvents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of non-toxic pigment choices will virtually eliminate the risk of acute or chronic disease related to the use of toxic pigments and solvents.</td>
<td>Risk of a variety of chronic and acute illnesses including respiratory disease, neurological damage, and cancers.</td>
</tr>
<tr>
<td>You can safely dispose of rags and excess paint in the trash and flush wash-water down the drain without harming the environment.</td>
<td>Rags, excess paint, and wash-water should be disposed of as hazardous waste.</td>
</tr>
<tr>
<td>Drying time is increased. Paintings will not emit toxins while drying.</td>
<td>Drying time is less due to evaporation of solvents. Paintings will continue to emit toxic fumes until fully dry.</td>
</tr>
<tr>
<td>Will meet government emission and safety standards.</td>
<td>Governmental organizations are paying increased attention to the use and disposal of toxic art materials.</td>
</tr>
<tr>
<td>A thicker paint medium is possible allowing increased experimentation with textural oil paintings and the use of painting knives.</td>
<td>Paint medium is thin and has less body, allowing less textural work.</td>
</tr>
<tr>
<td>Non-toxic pigments are more readily available and less expensive than toxic chemical pigments so you’ll save money.</td>
<td>Chemical based pigments are very costly to produce.</td>
</tr>
</tbody>
</table>
STUDIO SAFETY

Managing solvents is the key to studio safety.

Oil painting studios are immediately safer when artists remove strong solvents, especially turpentine, from their painting processes.

Turpentine

Turpentine, a known respiratory irritant, causes nausea and lightheadedness, dermatitis, kidney and bladder disease, and asthma. Turpentine is the only solvent commonly available to painters that is absorbed through healthy, unbroken skin. Turpentine is toxic. It is a biohazard and is considered Toxic Waste.

No TURPENTINE is allowed in the studio ever.

Odorless Mineral Spirits. (OMS) (Gamsol is Gamblin’s OMS product.)

Mineral spirits may be used as a less flammable and less toxic alternative to turpentine. Odorless Mineral Spirits are mineral spirits that have been further refined to remove the more toxic aromatic compounds, and are recommended for applications such as oil painting.

If OMS is used containers should be covered at all times and it should only be used in a small amount with a linseed oil or galkyd product, never alone and preferably rarely.

Paint and Medium Choices.

Mediums make oil colors thinner, thicker, glossy, or matte. Mediums can either speed up or slow down the drying time of oil colors.

Choose oil colors that don’t contain lead, arsenic or mercury. There are lightfast pigments in all colors that are free of toxic heavy metals.

Choose mediums that are not based on natural resins, which require turpentine or strong solvents to dissolve. Odorless mineral spirit (OMS) is not strong enough to dissolve natural resins or to extend natural resin varnishes. Using OMS will cause the varnish to cloud. Painters who choose to use natural resin varnish as a component of mediums must use turpentine.

You have choices. There are many companies making products now with 100% pure odorless mineral spirits; alkyd resins replaced natural resins. Like 19th century stand oil, alkyd resin is made by heating oil until it polymerizes. Alkyds have been formulated for use in artists' materials, most successfully as an oil painting medium because alkyd resin cannot hold the high pigment load of linseed oil.

Solvent alternatives.

Instead of using solvents to thin your oil paints, use a combination of purified or sun-thickened linseed oil (NOT UNREFINED LINSEED OIL) with stand oil in a 3 to 1 or 2 to 1 ratio - depending on how thick you want your medium. Mix oil into your paint using 50% oil mixture with 50% paint OR 25% oil with 75% paint, depending on how stiff you want your paint to be. Sun-thickened linseed oil in place of purified linseed oil will allow your paintings to dry quicker but is more costly than purified linseed oil. Use a non-toxic brush cleaner followed by soap and


water for brushes, palette, and skin; or vegetable oil followed by soap and water will work just as well. **We do not recommend painters use "alternative solvents" such as citrus solvents as ingredients in painting mediums. They have not been tested by conservation scientists.**

**Ventilation.**

**Good ventilation is essential for a safe studio.** Open the windows to increase air circulation and insert a fan, wind blowing out the window to remove fumes from the room.

**Painters who are using Gamsol and Galkyd do not need respirator masks or exhaust systems, but artists working in media requiring strong solvents or chemicals (printmaking or silk-screening for examples) or fixative sprays (pastels) should follow the recommendations of the manufacturers.**

**Recycling solvents.**

Gamsol and OMS can be reused until the solvent will not longer clear. Set up a simple system. Use two sealable cans or glass jars. After a painting session, pour dirty solvent into the first can. Let the solvent settle then pour off the clear solvent into the second clean can. Repeat the process and add another settling can if needed. Keep all settling cans completely closed.

**Solvent, rag and solid waste disposal.**

To protect the watershed, no artists' materials, including acrylics, oil/water media and watercolors, should ever be washed down the drain.

Once Gamsol or OMS will no longer settle, dispose of in the marked cannisters.

**Spontaneous Combustion.**

Because rags soaked in any solvent or linseed oil can spontaneously combust, keep all rags, including paper towels, in closed metal containers.

**LEAD.**

Lead is the only toxic pigment still occasionally used in oil painting. Lead pigments are no longer being made in Western Europe or North America. Currently, there are no reliable sources of pigment made with lead. Painters should not assume that they are buying genuine Flake White any more.

Do not sand lead-based paints because that releases the pigment from the binder. **Dispose of solvent containing lead pigments with hazardous materials.**

**DO NOT DISPOSE OF LEAD-BASED PAINTS or SOLVENTS CONTAINING LEAD PIGMENTS IN THE TRASH.**

Regarding other pigments and oil paints, the art materials' industry is the second most regulated industry in America. If you do not see caution labels, the materials are not toxic. For more information on health warning labels, contact the The Art & Creative Materials Institute, Inc. (ACMI)
On November 18, 1988, the Labeling of Hazardous Art Materials Act (Public Law 100-695) was signed into law. This law requires that all art materials be reviewed to determine the potential for causing a chronic hazard and that appropriate warning labels be put on those art materials found to pose a chronic hazard. The term "art material" includes "any substance marketed or represented by the producer or repackager as suitable for use in any phase of the creation of any work of visual or graphic art of any medium." The "Labeling of Hazardous Art Materials Act" (LHAMA) amended the Federal Hazardous Substances Act (FHSA) by adding Section 23 and designating the ASTM Standard Practice for Labeling Art Materials for Chronic Health Hazards (ASTM D-4236-88) as a regulation under Section 3(b) of the FHSA.

Most manufacturers use the guidelines of ASTM D 4236, Standard Practice for Labeling Art Materials for Chronic Health Hazard. Below are the labels printed on most manufactures packaging. Note that some companies, such as Golden Acrylics, have designed their own labels. If you are uncertain about a product’s toxicity or cannot find a label the store you are buying it from should have the Material Safety Data Sheet (MSDS) on file.

AP Seal : The new AP (Approved Product) Seal, with or without Performance Certification, identifies art materials that are safe and that are certified in a toxicological evaluation by a medical expert to contain no materials in sufficient quantities to be toxic or injurious to humans, including children, or to cause acute or chronic health problems.

–Art & Creative Materials Institute (ACMI)

CL Seal : “The CL Seal identifies products that are certified to be properly labeled in a program of toxicological evaluation by a medical expert for any known health risks and with information on the safe and proper use of these materials. This seal is currently replacing the HL Health Label (Cautions Required) Seal over a 5-year phase-in period. These two Seals appear on only 15% of the adult art materials in ACMI’s certification program and on none of the children’s materials. These products are also certified by ACMI to be labeled in accordance with the chronic hazard labeling standard…”

– Art & Creative Materials Institute (ACMI)

Golden takes a decidedly more cautious stance on their product labeling:

**Non-Toxic**
Based upon toxicological review, there are no acute or known chronic health hazards with anticipated use of this product (most chemicals are not fully tested for chronic toxicity).

**Warning**
This product contains a chemical known to the State of California to cause cancer.

**X Means Harmful**
WARNING: DO NOT SPRAY APPLY– This product contains cadmium, a chemical known to the State of California to cause cancer.

Additional Health Labeling: California Proposition 65

The State of California requires clear and reasonable warnings on products and/or storage containers containing chemicals that have been shown to cause cancer, birth defects, or other reproductive harm. Even if these products contain only trace levels of harmful chemicals, a warning is required by the State of California.

Manufacturers of certain products have included warnings pursuant to California Proposition 65, and caution is recommended when using products marked with the Prop 65 icon.
Waste Disposal

Types of Wastes

There are several types of wastes that can be generated in the studios. Some examples include:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oily rags</td>
<td>Solvent wastes (paint thinner, OMS, etc.)</td>
<td></td>
</tr>
<tr>
<td>Paints</td>
<td>Linseed oil</td>
<td>Photographic chemicals</td>
</tr>
<tr>
<td>Baby oil</td>
<td>Ceramic glaze</td>
<td>Acids and bases</td>
</tr>
<tr>
<td>Sharp implements</td>
<td>Lubricating oils</td>
<td>Empty chemical containers</td>
</tr>
</tbody>
</table>

Many of these wastes are considered hazardous waste by the US Environmental Protections Agency (EPA) and require special handling. These materials may not be poured down the drain.

Oily Rags

Oily rags must be placed in the oily rag container. Do not leave oily rags lying around the floor. Linseed oil, in particular, can ignite on its own if left out, causing fire that may spread to other areas. Please make sure the contain is sealed before you leave the studio.

Solvents

Solvents, such as paint thinner, turpentine, toluene, xylene, and alcohols are considered hazardous waste. DO NOT DUMP them down the drain. Follow the instructions for handling hazardous waste.

Paints

Oil-based paints are considered hazardous waste. DO NOT DUMP oil-based paint down the drain or place in regular trash. Oil-based paints may be combined with solvents and linseed oil for disposal. Follow the instructions for handling hazardous wastes. Latex paints should be dried out and placed in regular trash. Water-based paints may be disposed in the waterbased media waste container.

Baby Oil

Baby oil is not considered hazardous waste. Baby oil can be used to clean brushes and can be washed down the drain. Excess baby oil can be disposed in the regular trash.

Linseed Oil

Because of its potential for fire, linseed oil should be handled as a hazardous waste, in a similar manner as solvents. Linseed oil can be combined with oil-based paints and solvents for disposal. Follow the instructions for handling hazardous waste.
Ceramic Glaze
Many ceramic glazes contain metals that are considered hazardous waste. Unused portions of the glazes should be disposed as hazardous waste. Glaze preparation and rinsing should be conducted only in the sink specified for this purpose. This sink is equipped with a settling tank to prevent the solids from entering the drain.

Acids and Bases
Materials with a pH of less than 2 or more than 12.5 are considered hazardous waste. Do not mix these wastes with the solvent or oil wastes. Use care when handling acids and bases and follow the instructions for handling hazardous waste.

Broken Glass Sharp Implements
Sharp objects, such as razor blades, knives, and broken glass should be packaged in a puncture-proof jar or box and placed in the regular trash. Pre-packaging helps to avoid injury to janitors or others handling the trash.

Handling Hazardous Waste
Materials that are to be disposed of as hazardous waste must be placed in sealable containers. The Painting Studios have sealable drums for you to dispose of your hazardous waste. There is a container for oil based paint, oil, mediums and solvents, one for watermedia and another for painting rags. Please make sure the drums are sealed and that you dispose of your waste in the correct container.

Procedure
1. Place the waste materials in the appropriate waste container.
2. Seal the container.

When the waste containers at are not available to you, Your hazardous waste must be placed in sealable containers. Containers should be filled, leaving a headspace for expansion of the contents. Often the original container is perfectly acceptable. You should label the container as hazardous waste and contact your local waste management about safe disposal of your waste.

General Recommendations
- Don’t purchase more of a material than you expect to use in the foreseeable future. The costs of disposal often exceed the purchase cost by a considerable margin.
- Substitute with a less hazardous material whenever possible.
- Keep all chemical containers clearly and unambiguously labeled.
- Dispose of your wastes at the completion of a project - don’t abandon them for someone else to deal with later.
BRUSH CARE 101 / TAKE CARE OF YOUR BRUSHES - THEY’RE EXPENSIVE

No turpentines or traditional paint thinners are allowed in the painting studios. Below are instructions and brush cleaners you can use to keep your brushes clean and in working order for years.

1. Wipe off any excess paint using a cloth or soft tissue. Gently squeezing the bristles from the ferrule edge outwards with your fingers, or with a cloth, will help remove paint from the brush. But be careful to avoid pulling on the bristles.
2. Rinse the brush in brush cleaner -- oil if you’ve been using oils or lukewarm water if you’ve been using a water-based medium. Never use hot water as it can expand the ferrule, causing the hairs to fall out.
3. Wipe it on the cloth again to remove the last of the excess paint.
4. Wash gently using a little bit of mild soap (or a gentle dishwashing liquid). Dab the brush gently onto the piece of soap, then work up a lather in a small container (or the palm of your hand if you’re not using any toxic pigments or solvents).
5. Rinse and repeat until there’s no trace of any color coming out. Over time a brush may become stained, but don’t stop rinsing until you’re sure there’s no paint left.
6. Rinse once more in clean, lukewarm water to remove any traces of soap. Shake off the water.
7. Use your fingers to gently shape the brush head into its correct shape.
8. If necessary, wrap the bristles in a piece of tissue or toilet paper while the brush is still wet. When the paper dries it’ll contract, pulling the bristles into shape.
9. Leave brush to dry at room temperature. Make sure it’s not resting on its head or it will dry misshapen. Standing it on the back of the handle works well.
10. If you’re worried about the toxicity of the paint you’re working with, wear gloves while painting and cleaning your brushes. Also if you find the paint is drying out and cracking, or staining your skin.

Tips:

1. Always use separate brushes for oil painting and water-based medium. After all, oil repels water. Also use separate brushes for varnish, gesso, and masking fluid.
2. Don’t let acrylic paint dry on a brush as its water-resistant when dry. But also never leave a brush standing in water.
3. Never use a lot of pressure to force paint out of a brush. Be patient and rinse it several times.
4. If your brush is made from natural bristle, you can soften it by dipping it in clean oil (the one you use as a medium) after you have cleaned it.
5. Misshapen synthetic brushes can sometimes be reshaped by soaking them in hot water (not boiling).

ALTERNATIVE BRUSH CLEANERS

Brush Flush contains no harsh chemicals and is non-toxic, non-poisonous, non-flammable, biodegradable, water rinsable and odor free. It is specifically formulated to remove wet or hardened oil based or latex based paints, stains, varnishes, shellacs, urethanes and other surface coatings from brushes, rollers, air and airless sprayers. It can be used in place of all brush cleaners, paint thinner, mineral spirits and turpentine but cannot be mixed into paint or into any medium.

Winsor & Newton Brush Cleaner and Restorer is a water soluble cleaner that is non-toxic, biodegradable, non-flammable, and has low vapor. It completely cleans dried acrylics, oils, and alkyds with no damage to the brush head or loss of fibers. It can be used on natural or synthetic brushes. The cleaning solution is effective within minutes for oil colors (hours for dried acrylics), and leaves no oil residue.

VEGETABLE OIL AND DISH SOAP

An inexpensive and ecologically sound cleaning solution is to use a combination of vegetable (or baby oil) and dish soap to clean ones brushes. Especially for oil paint. The oil will help remove excess paint from the brush while the soap will cut through the oil and help remove the remainder of the oil paint. Do not use this method with acrylic or watercolor paint as the oil will react against the paints.
<table>
<thead>
<tr>
<th>BRUSHES</th>
<th>DESCRIPTIONS AND USES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Angular</strong></td>
<td>Flat ferrule, short-length hairs, set with longer hairs at one end. Useful for precise strokes, and for lines and curves, with thick or heavy color.</td>
</tr>
<tr>
<td><strong>Bright</strong></td>
<td>Flat ferrule, short-length hairs, usually set in a long handle. Width and length of brush head is about equal. Useful for short, controlled strokes, and with thick or heavy color.</td>
</tr>
<tr>
<td><strong>Fan</strong></td>
<td>Flat ferrule, spread hairs. Natural hair is more suitable for soft blending, and synthetic works well for textural effects. Useful for smoothing and blending, special effects and textures.</td>
</tr>
<tr>
<td><strong>Filbert</strong></td>
<td>Thick, flat ferrule and oval-shaped medium to long hairs. Long handles. Natural hair is more suitable for blending because the hairs hold together when wet. With its soft rounded edges, the filbert is suitable for blending and figurative work.</td>
</tr>
<tr>
<td><strong>Flat</strong></td>
<td>Flat ferrule, square-ended, with medium to long hairs. Provides lots of color capacity and easy maneuverability. Use for bold, sweeping strokes, or on edge for fine lines. Use heavier filling for heavier paint.</td>
</tr>
<tr>
<td><strong>Hake</strong></td>
<td>A hake brush is an oriental-style wash brush on a long flat handle. It is useful for laying in large areas of water or color, for wetting the surface, and for absorbing excess media.</td>
</tr>
<tr>
<td><strong>Highliner</strong></td>
<td>Also known as an outliner. Round ferrule, square-ended brush, with extra-long hairs and a short handle. Large color carrying capacity. Useful for delicate lettering, outlining, and long continuous strokes.</td>
</tr>
<tr>
<td><strong>Mop</strong></td>
<td>A mop is a round, full version of the wash brush, made of soft, absorbent natural hair. It is useful for laying in large areas of water or color, for wetting the surface, and for absorbing excess media.</td>
</tr>
<tr>
<td><strong>One Stroke</strong></td>
<td>Flat ferrule, square-ended medium to long length hairs. Short handles. Large color carrying capacity. Useful for painting block letters in a single stroke.</td>
</tr>
<tr>
<td><strong>Oval Wash</strong></td>
<td>Wash brushes come in varied shapes. The oval wash has rounded hairs, flat ferrules, and produces a soft edge, with no point. A wash brush is useful for laying in large areas of water or color, for wetting the surface, and for absorbing excess media.</td>
</tr>
<tr>
<td><strong>Round</strong></td>
<td>Round ferrule, round or pointed tip. Useful for detail, wash, fills, and thin to thick lines. A pointed round is used for fine detail. A detailer is a pointed round with very short hair.</td>
</tr>
<tr>
<td><strong>Sash</strong></td>
<td>The long handles and tapered bristles are perfect for detailed work on large paintings. Also good for delicate decorative painting.</td>
</tr>
<tr>
<td><strong>Script/Liner</strong></td>
<td>Pointed, narrow brush with very long hair. Liners are shorter and narrower. Short handles, round ferrules. Large color carrying capacity. Useful for delicate lettering, highlighting, outlining, and long continuous strokes.</td>
</tr>
<tr>
<td><strong>Square Wash</strong></td>
<td>Wash brushes come in varied shapes. The square wash can produce varying shapes and widths, and often has a short, “flat-footed” handle for scraping, burnishing, and separating watercolor paper from blocks. A wash brush is useful for laying in large areas of water or color, for wetting the surface, and for absorbing excess media.</td>
</tr>
</tbody>
</table>
Pigments

Paints are pigments mixed with a vehicle or binder. Both inorganic and organic pigments are used as colorants. Dry pigments are especially hazardous because they are easily inhaled and ingested. They are used in encaustic, paper-marbleizing and in the fabrication of paint products, and will be discussed more thoroughly in the section below on pastels.

Pigments vs. Hues

Paints with the word “hue” at the end do not contain metal pigments and are considered non-toxic. These are most easily identified by the product name. If the paint is described as hue, such as “chromium yellow hue”, there is no (or too little to be concerned about) toxic metal contained in the product. Note: just because something is listed as non-toxic does not mean that it is not harmful when handled improperly. The substance could still contaminate the watershed or be harmful if ingested, etc.

Hazards

1. Poisoning can occur if toxic pigments are inhaled or ingested. The main hazard in standard painting techniques is accidental ingestion of pigments due to eating, drinking or smoking while working, inadvertent hand to mouth contact, or pointing the paint brush with the lips. If methods such as spraying, heating, or sanding are employed then there is an opportunity for inhalation of toxic pigments.
2. The classic example of a toxic inorganic pigment in painting is white lead, or flake white (basic lead carbonate). Lead pigments can cause anemia, gastrointestinal problems, peripheral nerve damage (and brain damage in children), kidney damage and reproductive system damage. Other inorganic pigments may be hazardous, including pigments based on cobalt, cadmium, and manganese.
3. Some of the inorganic pigments, in particular cadmium pigments, chrome yellow and zinc yellow may cause lung cancer. In addition lamp black and carbon black may contain impurities that can cause skin cancer.
4. Chromate pigments (chrome yellow and zinc yellow) may cause skin ulceration and allergic skin reactions (such as rashes).
5. The long-term hazards of the modern synthetic organic pigments have not been well studied.

Precautions

1. Obtain MSDSs on your paints to find out what pigments you are using. This is especially important because the name that appears on the tube of color may or may not truly represent the pigments present. Manufacturers may keep the name of a color while reformulating the ingredients.
2. Use the least toxic pigments possible. Do not use lead or carcinogenic pigments.
3. Avoid mixing dry pigments whenever possible. If dry pigments are mixed, do it inside a glove box (a box with a glass or plexiglas top and holes in the sides for arms) or inside a laboratory-type fume hood.
4. Wet mop and wipe all surfaces when using dry pigments.
5. Avoid using dishes, containers or utensils from the kitchen to mix and store paints and pigments.
PIGMENTS / Degrees of Toxicity

Listed below are the common name of the pigment and the reason they are so toxic.

**NOTE:** Paints with the word "hue" at the end of their name are actually substitutes for the original, and are usually non-toxic. For instance, Cadmium Yellow Hue contains no actual Cadmium Yellow, but is usually a blend of the non-toxic Arylide Yellow G and Arylide Yellow 10G.

<table>
<thead>
<tr>
<th>HIGHLY TOXIC PIGMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony White Contains antimony</td>
</tr>
<tr>
<td>Barium Yellow Contains barium and chromates</td>
</tr>
<tr>
<td>Burnt or Raw Umber Contains iron oxides, manganese silicates or dioxide</td>
</tr>
<tr>
<td>Cadmium Red, orange or yellow Contains cadmium sulfide, cadmium selenide</td>
</tr>
<tr>
<td>Chrome Green, Orange or Yellow Contains lead and chromates</td>
</tr>
<tr>
<td>Cobalt Violet or Yellow Contains cobalt, cobalt phosphate and arsenite</td>
</tr>
<tr>
<td>Lead or Flake white Contains lead carbonate</td>
</tr>
<tr>
<td>Lithol Red Contains sodium, barium and calcium salts of azo pigments</td>
</tr>
<tr>
<td>Manganese Violet Contains manganese and barium</td>
</tr>
<tr>
<td>Molybdate Orange Contains lead chromate, molybdate and sulfate</td>
</tr>
<tr>
<td>Naples Yellow Contains lead and antimony</td>
</tr>
<tr>
<td>Strontium Yellow Contains chromates</td>
</tr>
<tr>
<td>Vermilion Contains mercury compounds</td>
</tr>
<tr>
<td>Zinc White Contains chromates</td>
</tr>
<tr>
<td>Zinc Yellow Contains chromates</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODERATELY TOXIC PIGMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alizarin Crimson</td>
</tr>
<tr>
<td>Carbon Black</td>
</tr>
<tr>
<td>Cerulean Blue Contains cobalt stannate</td>
</tr>
<tr>
<td>Cobalt Blue Contains cobalt stannate</td>
</tr>
<tr>
<td>Cobalt Green Contains calcined cobalt, zinc and aluminum oxides</td>
</tr>
<tr>
<td>Chromium Oxide Green [Olive Green, Permanent Green, Green 17] Contains chromic oxide</td>
</tr>
<tr>
<td>Phthalo Blue and Greens Contains copper phthalocyanine</td>
</tr>
<tr>
<td>Manganese Blue [Blue 33] Contains manganese</td>
</tr>
<tr>
<td>Prussian Blue [Iron Blue, Milori Blue, Bronze Blue, Blue 27] Contains cyanide compounds</td>
</tr>
<tr>
<td>Toluidine Red and Yellow Contains insoluble azo pigment</td>
</tr>
<tr>
<td>Viridian [Emeraude Green, Green 18] Contains chromic oxide</td>
</tr>
<tr>
<td>Zinc White Contains zinc oxide</td>
</tr>
</tbody>
</table>
Non Water-Based Paints

Oil paints, encaustic and egg tempera use linseed oil, wax and egg respectively as vehicles, although traditionally solvents are often used as a thinner and for cleanup (see Studio Safety, and Brush Cleaning sections for proper handling and cleaning in the Studios). Alkyd paints use solvents as their vehicle. In addition many commercial paints used by artists also contain solvents.

Hazards

1. See section above for pigment hazards.
2. All solvents can cause defatting of the skin and dermatitis from prolonged or repeated exposure. Turpentine can also cause skin allergies and be absorbed through the skin.
3. Acute inhalation of high concentrations of mineral spirits, turpentine vapors, and other solvents can cause narcosis, which can include symptoms of dizziness, headaches, drowsiness, nausea, fatigue, loss of coordination, coma, as well as respiratory irritation.
4. Chronic inhalation of large amounts of solvents could result in decreased coordination, behavioral changes and brain damage. Chronic inhalation of turpentine can cause kidney damage and respiratory irritation and allergies. Odorless mineral spirits and turpenoid, in which the aromatic hydrocarbons have been removed, are less hazardous.
5. Ingestion of either turpentine or mineral spirits can be fatal. In the case of mineral spirits, this is usually due to chemical pneumonia caused by aspiration (breathing in) of the mineral spirits into the lungs after vomiting.
6. Natural resins (copal, damar, rosin, Japanese Lacquer) may cause skin irritation or allergies. Rosin dust can cause asthma.
7. Encaustic involves suspending pigments in molten wax. If the wax is overheated, flammable wax vapors and wax decomposition fumes are produced, which are strong respiratory irritants.
8. Epoxy paints consist of an epoxy resin component containing the pigment, and a hardener component. The epoxy resin may contain diglycidyl ethers which are irritants, may cause bone marrow damage, and are suspect carcinogens. Epoxy hardeners may cause skin and respiratory allergies and irritation.

Precautions

1. Whenever possible replace turpentine or ordinary mineral spirits with the less toxic odorless mineral spirits. Mineral spirits is also less flammable than turpentine, since its flashpoint is over 100 F (38 C), while turpentine has a flashpoint of 95 F, (35 C).
2. Apply the same health and safety considerations for the use of "citrus" or "pine" solvents. These have been found to be quite irritating to the skin and eyes.
3. If possible, artists should set up their easel about 3 feet from a window that has a fan exhausting at work level and pulling the solvent vapors away from your face.
4. Techniques such as turpentine washes will require a lot of ventilation because they result in the evaporation of large amounts of solvents in a short period of time. Acrylic paint can be substituted for underpainting.
5. Ventilation only needs to be provided while the solvent is evaporating from the canvas, not during the time while the oil paint film is drying (oxidizing).
6. Wear neoprene gloves while cleaning brushes with mineral spirits or turpentine.
7. Used solvent can be reclaimed by allowing the paint to settle and then pouring off the clear solvent.
8. Paint can be removed from your hands with baby oil, and then soap and water.
9. Wax should be only heated to the minimum temperature needed for proper flow of the paint. Do not heat with open flame or hot plate with exposed element. During pregnancy and nursing, switch to water-based paints to avoid exposure to solvents.

**Alternative Oil Painting Mediums**

**Galkyd products. (Gamblin)**
Galkyd painting mediums speed the drying time of oil colors and increase their flexibility. Galkyds will not yellow over time and the painting mediums are formulated for different painting techniques. Most importantly using Galkyds means painters can remove turpentine entirely from their painting process.

*Galkyd* is like a medium made from stand oil so use Galkyd to level brush strokes.

*Galkyd Lite* is like a linseed oil based medium so use Galkyd Lite for direct painting and techniques where leaving brush marks is desired.

*Galkyd Slow Dry* gives painters time to work wet into wet.

*Galkyd Gel (G-Gel)* creates transparent impasto.

**Walnut Oil**
Walnut oil is a pale yellow-brown oil (when newly made it's a pale oil with a greenish tinge) that has a distinctive smell. As it's a thin oil, it's used to make oil paint more fluid. As it yellows less than linseed oil (but more than safflower oil) it's good for pale colors. Walnut oil dries in four or five days. It's an expensive oil and must be stored correctly otherwise it goes rancid (off). It generally needs to be kept in a cool dark space or refrigerated. If you have a reaction to linseed oil, walnut oil is a good alternative.

**Walnut Alkyd Medium**
Walnut/Alkyd Medium was developed to provide artist's with a non-toxic, environmentally responsible alternative to solvent based, rapid drying alkyd mediums. This is a medium that closely resembles the wonderful combinations of sun-thickened oil and natural resins used so effectively throughout the history of art but with the singular advantage of being free from solvents. This medium, unlike straight walnut oil, does not easily go rancid.
Water-Based Paints

Water-based paints include water color, acrylic, gouache, milk paint, tempera and casein. Water is used for thinning and cleanup.

Hazards

1. See section above for pigment hazards.
2. Acrylic paints contain a small amount of ammonia. Some sensitive people may experience eye, nose and throat irritation from the ammonia. Acrylics and some gouaches contain a very small amount of formaldehyde as a preservative. Only people already sensitized to formaldehyde would experience allergic reactions from the trace amount of formaldehyde found in acrylics. The amounts can vary from manufacturer to manufacturer.
3. Casein paints use the protein casein as a binder. While soluble forms are available, casein can be dissolved in ammonium hydroxide which is moderately irritating by skin contact and highly irritating by eye contact, ingestion, and inhalation.
4. All water-based paints contain a preservative to prevent mold or bacterial growth. Sometimes artists add preservatives when they make their own paints. Although present in small amounts, certain preservatives may cause allergic reactions in some people.

Precautions

1. See section above for precautions when mixing dry pigments.
2. If you add your own preservative, avoid using sodium fluoride, phenol or mercury compounds. For tempera, a small amount of pine oil works for short periods of time.
3. If you experience eye, nose or throat irritation while using acrylics, opening a window is usually sufficient; if not try a window exhaust fan.
4. If you mix casein paints using ammonium hydroxide, you will need a window exhaust fan to provide ventilation.
5. Wear gloves, goggles and protective apron when handling ammonia. An eyewash fountain should be available when handling ammonia.

Water-based oils

A modern variety of oil paint engineered to be thinned and cleaned up with water, thus making it possible to avoid using chemicals such as turpentine, whose fumes may be harmful if inhaled (making it necessary to take precautions, such as using the solvent in a ventilated environment). Water-based oil paint can be mixed and applied using the same techniques as traditional oil-based paint, but while still wet it can be effectively removed from brushes, palettes, and rags with ordinary soap and water.

The traditional rule of gradation of layers — “fat over lean,” or flexible over less flexible — applies to water-based oil paint as it does to traditional oil, and in this respect the two kinds of paint behave in the same way. However, their handling is slightly different: when thinned to a considerably liquid phase, water-based oil paint tends to feel and behave like
watercolor (although, unlike watercolor, and to a greater extent than traditional oil, it may lose adhesion to the ground or support if over-thinned); by contrast, when used as a short paste without water for heavy impasto work, it tends to drag, developing a consistency somewhat "gummier" or tackier than the more buttery one characteristic of oils. At midrange (between short paste and long paste) water-based oil paint is gouache-like, sharing the properties of both transparent watercolor and opaque oil (in the manner of watercolor, for example, some colors will darken upon drying, the more so as more water is mixed into the paint, and in the manner of oil, the paint film will have some thickness to it). Also gouache-like is the overall effect, which tends to be matte as compared to the glossier oil, but this too is a property that will vary, depending on the pigment used and on any mediums (or diluents) mixed into it, as well as on the pastiness of the paint (as a general rule, the pastier, the glossier). The handling of water-based oil paint, in summary, changes considerably as it passes from one phase to another: this makes it a versatile medium but, by the same token, it also requires the artist to develop by experience specific skills with which to successfully manipulate it and exploit its range to achieve the desired effect. It is not recommended that water mixable oils be mixed with acrylics because in the difference in drying times between oils and acrylics. Some brands claim this is possible, but the National Gallery's head conservationist has made the statement that the mixture of acrylic and oils mediums is not suitable for the archivability of a painting, based on the oxidizing/drying rates of the two different mediums. The result would consist of the two mediums pulling apart and cracking over a short time.

**Milk Paint**

Milk paint has been around for centuries and is being rediscovered as an environmentally friendly paint alternative as it is completely biodegradable, with no VOCS, HAPs or EPA-exempt solvents added. It has been used commercially in furniture finishing and as a wallpaint but recently has gained interest by fine artists. Manufacturers such as the Old Fashion Milk Paint Company and the Real Milk Paint Company are making powered paints that can be mixed by the artist in the studio (see section on Pigments above). It will spoil if left out and can only be used for a couple days after it is mixed if it is refrigerated.
Airbrush, Spray Cans, and Spray Guns

Artists use many products in spray form, including fixatives, retouching sprays, paint sprays, varnishes, and adhesive sprays. Airbrush, aerosol spray can and spray guns are used.

Hazards

1. Spray mists are particularly hazardous because they are easily inhaled. If the paint being sprayed contains solvents, then you can be inhaling liquid droplets of the solvents. In addition the pigments are also easily inhaled, creating a much more dangerous situation than applying paint by brush.
2. Aerosol spray paints have an additional hazard besides pigments and solvents. They contain propellants, usually isobutanes and propane, which are extremely flammable and have been the cause of many fires. Other aerosol spray products such as retouching sprays, spray varnishes, etc. also contain solvents, propellants and particulates being sprayed.
3. Airbrushing produces a fine mist which is a serious inhalation hazard because artists work so close to their art work. Airbrushing solvent-containing paints is especially dangerous.
4. Spray guns are less common in art painting but usually involve spraying much larger quantities of paint than either spray cans or airbrush. Spraying solvent-based paints is a serious fire hazard.

Precautions

1. See section above for precautions with pigments.
2. Try to brush items rather than spraying if possible.
3. Use water-based airbrushing paints and inks rather than solvent-based paints.
4. Use spray cans or an airbrush in a spray booth if possible.
5. If ventilation is not adequate, then respiratory protection is necessary while air brushing or spraying. Contact EHS for selection and fit-testing.
6. Never try to spray paint by blowing air from your mouth through a tube. This can lead to accidental ingestion of the paint.
Dry Drawing Media

This includes dust-creating media such as charcoal and pastels which are often fixed with aerosol spray fixatives, and media such as crayons and oil pastels which do not create dust.

Hazards

1. Pencils are made with graphite, rather than lead and are not considered a hazard. Colored pencils have pigments added to the graphite, but the amounts are small so that there is no significant risk of exposure. Over 10 years ago, a significant hazard in pencils was from lead chromate paint on the exterior of yellow pencils. However this has since been eliminated as a risk.

2. Charcoal is usually made from willow or vine sticks, where wood cellulose has been heated without moisture to create the black color. Compressed charcoal sticks use various resins in a binder to create the color. Although charcoal is just considered a nuisance dust, inhalation of large amounts of charcoal dust can create chronic lung problems through a mechanical irritation and clogging effect. A major source of charcoal inhalation is from the habit of blowing excess charcoal dust off the drawing.

3. Colored chalks are also considered nuisance dusts. Some chalks are dustier than others. Individuals who have asthma sometimes have problems with dusty chalks, but this is a nonspecific dust reaction, not a toxic reaction.

4. Pastel sticks and pencils consist of pigments bound into solid form by a resin. Inhalation of pastel dusts is the major hazard. Some pastels are dustier than others. Pastels can contain toxic pigments such as chrome yellow (lead chromate) which can cause lung cancer, and cadmium pigments (which can cause kidney and lung damage and are suspect human carcinogens). Blowing excess pastel dust off the drawing is one major source of inhalation of pastel pigments. Pastel artists have often complained of blowing their nose different colors for days after using pastels, a clear indication of inhalation.

5. Crayons and oil pastels do not present an inhalation hazard, and thus are much safer than pastels. Some oil pastels can contain toxic pigments, but this is only a hazard by accidental ingestion.

6. Both permanent and workable spray fixatives used to fix drawings contain toxic solvents. There is high exposure by inhalation to these solvents because the products are sprayed in the air, often right on a desk or easel. In addition you can be inhaling the plastic particulates that comprise the fixative itself.

7. Never try to spray fixative by blowing air from your mouth through a tube. This can lead to accidental ingestion of the fixative.

Precautions

1. Use the least dusty types of pastels, chalks, etc. Asthmatics in particular might want to switch to oil pastels or similar non-dusty media.

2. Spray fixatives should be used with a spray booth that exhausts to the outside. If use of spray fixatives is occasional, you can use them outdoors with a NIOSH-approved respirator equipped with organic vapor cartridges and dust and mists filter for protection against inhalation of solvent vapors and particulates. An exhaust fan is also needed to remove organic vapors and particulates.

3. Don’t blow off excess pastel or charcoal dust with your mouth. Instead tap off the built up dust so it falls to the floor (or paper on floor).

4. Wet-mop and wet-wipe all surfaces clean of dusts.

5. If inhalation of dusts is a problem, a respirator may be appropriate. Contact EHS for selection and fit-testing.
Liquid Drawing Media

This includes both water-based and solvent-based pen and ink and felt tip markers. Hazards of dry erase or white board markers can be considered here, although they are more used in teaching or commercial art.

Hazards

1. Drawing inks are usually water-based, but there are some solvent-based drawing inks. These usually contain toxic solvents like xylene.
2. Permanent felt tip markers used in design or graphic arts contain solvents. Xylene, which is a highly toxic aromatic hydrocarbon, is the most common ingredient; newer brands often contain the less toxic propyl alcohol (although it is an eye, nose and throat irritant). The major hazard from using permanent markers results from using a number of them at the same time at close range.

Precautions

1. Use water-based markers and drawing inks if possible.
2. Alcohol-based markers are less toxic than aromatic solvent-based markers.
3. Solvent-based drawing inks and permanent markers should be used with good dilution ventilation (e.g. window exhaust fan).

Never paint on the body with markers or drawing inks. Body painting should be done with cosmetic colors.
**Painting Terminology**

**Achromatic** – Black, white and grays. An artwork executed without color.

**Acrylic** – fast-drying, water-based paint containing pigment suspended in an acrylic polymer emulsion. Acrylic paints can be diluted with water, but become water-resistant when dry.

**Analogous Colors** – Red and Orange, Blue and Green, etc. These are colors right next to each other on the color wheel.

**Bristle Brush** – Stiff, course natural-hair brush that is resilient and tough. The stiff hairs of the brush create a texture or trace in the paint. Best for thick paint or when brushstrokes are preferred seen.

**Brushes**

Brush styles are designated by a letter following a series number. Some basic brushes to meet your needs:

- F - Flats, square edge, long bristle
- B - Brights, flat, square-edged, long sable
- R - Rounds, pointed bristle
- L - Longs, flat, square-edge, long sable
- Filberts - Flat, oval edge, long fibre

**Canvas** – Fabric usually made from cotton or linen fiber, which are prepared for painting. Available in panels, stretched on frames, or obtained by the yard.

**Chroma** – the intensity, or strength, or purity of a color. Squeezing paint directly from the tube to the palette is ‘full chroma’. Also referred to just as intensity.

**Color** – When light is reflected off an object, color is what the eye sees. The primary colors are red, yellow and blue. The secondary colors are orange, purple and green.

**Color Temperature** – Colors are warm, hot or cold in appearance; ex. Orange (warm), red (hot), blue (cool). This is true within each category of color. There are hotter and colder colors in every category.

**Complementary Colors** – Red and Green, Blue and Orange, Purple and Yellow. These are the colors directly across from each other on the color wheel.

**Composition** – The arrangement of lines, colors and form.

**Glaze** – Color that is thinned to a transparent state and applied over previously painted areas to modify the original color.

**Gesso** – An acrylic primer for oil painting and acrylics to protect the underlying surface from paint soaking into it.
**Highlight** – Small areas on a painting or drawing on which reflected light is the brightest.

**Hue** – Another term for color. In paint manufacturing hue refers to an artificial replication of a natural mineral color. Ex. Cadmium Red vs. Cadmium Red (Hue). Generally the properties of the paints work differently than the genuine mineral. Often they are less potent, when mixed the color reacts differently and are less opaque. There have been growing advances in Hue colors though and most are non-toxic or less so.

**Impasto** – A manner of painting where the paint is laid on thickly so texture stands out in relief.

**Intensity** – the brightness or dullness of hue. Adding a color’s complimentary (the color directly across on the color wheel) will reduce its intensity. Also referred to as “Chroma” or “Saturation”.

**Linseed Oil** – The most commonly used carrier in oil paint. It can also be used as a painting medium, making oil paints more fluid, transparent and glossy. It is available in varieties such as Cold Pressed, alkali refined, sun bleached, sun thickened, and polymerized (stand oil).

**Mineral Spirits** – A petroleum distillate commonly used as a paint thinner and mild solvent. It is an alternative to turpentine, one that is both less flammable and less toxic. Because of interactions with pigments, artists require a higher grade of mineral spirits than many industrial users, including the complete absence of residual sulphur. *Odorless Mineral Spirits* are mineral spirits that have been further refined to remove the more toxic aromatic compounds

**Monochrome** – Using only one color to create a variety of values. Often times understood as being black and white but can be made using any one color.

**Oil Paints** – A type of slow-drying paint consisting of small pigment particles suspended in a drying oil that will gradually harden, forming a stable, impermeable film.

**Painting Mediums** – Any number of materials, usually liquid, that carry and bind pigment or paint together. Depending on their unique chemistry they can be combined to make a finish (or skin) of a painting more or less glossy, thicker, thinner, etc. Additionally, mediums can either speed up or slow down the drying time of paints.

**Palette Knife** – A trowel-type flexible knife used for mixing colors and painting impasto effects.

**Pigment** – Pigment is the material used to create the effect of color on any surface. It is made from a number of materials generally a mineral or other organic material (though many new synthetic pigments are made).

**Polychrome** – Using multiple colors to create a variety of values, shades, tints and tones.
**Primary Colors** – Red, Yellow, Blue. These 3 colors are the base colors for every other color on the color wheel. This is why they're called "primary." When you mix two primaries together, you get a secondary color.

**Sable Brush** – A natural-hair brush that allows for smooth brushstrokes and superior detail.

**Shades** – Using a mixture of color to create a black (or straight black) mixed with a color to make it darker. The opposite of shade is tint.

**Secondary Colors** – Orange, Green, Purple (Violet). The 3 colors created by mixing the primary colors together.

**Solvent** – In Painting, a liquid that dissolves a solid or liquid resulting in a solution. Such as turpentine or mineral spirits.

**Support** – This refers to any surface on which a painting is made. For ex. Canvas, masonite, paper, etc.

**Synthetic Bristle Brush** – Brushes made with synthetic polymer bristles. Most can be used with a variety of mediums.

**Tertiary Colors** – Made by mixing one primary color and one secondary color together. There can be endless combinations of tertiary colors, depending on how they’re mixed. These are the "in-between" colors like Yellow-Green and Red-Violet.

**Tints** – Created by mixing white to a hue. Also referred to as pastel colors. The opposite of tint is shade.

**Turpentine (or Grumtine)** – Used for cleaning equipment and to thin mediums. It is highly toxic.

**Tones** – The lightness or brightness (as well as darkness) of a color. Tones can be created by mixing a color with its complement.

**Underpainting** – An initial layer of paint applied to a ground, which serves as a base for subsequent layers of paint. Underpaintings are often monochromatic and help to define color values for later painting. If underpainting is done properly, it facilitates overpainting.

**Value** – The lightness or darkness of a hue. Shadows, darkness, contrasts and light are all values in artwork.

**Wash** – A highly fluid application of color.

**Watercolor** – Paints made of pigments suspended in a water-soluble vehicle (usually Gum Arabic).
Some Commerically available Alkyd Based Mediums

**Gel Mediums**

- **Chroma Archival Oils Gel Mediums**
  Use these gel mediums from Chroma with a variety of oil painting techniques.
  Prices range from $3.98 - $4.92

- **Da Vinci Alkyd Gel Quick Dry**
  Mix Da Vinci Alkyd Gel Quick Dry one to one with oil colors to accelerate drying time and increase color transparency. Colors will maintain a soft and creamy consistency.

- **Gamblin Galkyd Gel Medium**
  This gelled alkyd resin painting medium creates transparent impasto of approximately a quarter inch thick. Holds marks and brush strokes. It does not dry as fast as most gel mediums, and it can be applied in multiple layers.

- **Sennelier Gel 'N Dry**
  This is the gel version of Flow 'N Dry alkyd medium. Use it to speed drying and improve fluidity and gloss by adding 15-20% to paint. Suitable for impasto techniques, it comes in a 40 ml tube that travels well into the field for plein air painting.

- **Weber Res-N-Gel Quick Drying Extender Gel**
  This full-strength, ready-to-use, synthetic resin gel produces transparent, full-bodied colors. Extends expensive oil colors, prevents color running, retains brush strokes, holds sharply defined detail, adds luminosity and brilliance, accelerates drying.
Some Commercially available Alkyd Based Mediums

Liquid Mediums

**Chroma Archival Oils Fat Medium**
Recommended for experienced painters who work all day on the same painting, this syrupy, heavy-bodied liquid medium contains high solids to promote faster, more thorough drying of oils, and increase gloss and flow for enamel-like effects.

**Kinstler Alkyd Oil Painting Medium**
More than just a paint thinner, Kinstler Alkyd Painting Medium is a semi-synthetic polymer that significantly accelerates the drying time of oil colors. It can be mixed in any ratio to extend colors and is the ideal medium for creating transparent glazes.

**Da Vinci Liquid Alkyd Medium**
Mix one to one with oil colors to accelerate drying time and reduce viscosity.

**M. Graham Walnut Alkyd Medium**
This special medium was developed to provide a non-toxic, environmentally responsible alternative to solvent based, rapid drying alkyd mediums. It closely resembles combinations of sun-thickened oil and natural resins.

**Gamblin Galkyd Mediums**
Gamblin offers a great range of contemporary mediums. Using today’s safer materials, they recreate the properties of traditional mediums.

**Williamsburg Artist Alkyd Resin**
Similar in consistency to a thick Stand Oil, this medium is made from pure alkyd resin and a small amount of odorless thinner. Fast-drying and non-yellowing, it produces a flexible paint film. Use it to make other mediums or undiluted as a glazing and general painting medium.

**Gamblin Neo-Megilp**
Soft, silky gel that gives body to paint, decreases viscosity, and can produce a luminous atmosphere. Base of alkyd resin, without toxic lead or other materials. Will not turn yellow or darken.

**Winsor & Newton Liquin Mediums**
Durable, non-yellowing medium for thinning oil and alkyd colors, and for speeding drying time. Excellent for glazing and producing fine detail. TOXIC.
## Linseed and Drying Oils
### Alakali Refined Linseed Oil

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Da Vinci Linseed Oil</strong></td>
<td>Linseed oil increases the brilliance and transparency of colors, and helps to eliminate brush strokes. Da Vinci’s oil mediums are formulated especially for Da Vinci oil paints but can be used with any oil paint.</td>
</tr>
<tr>
<td><strong>Maimeri Linseed Oil</strong></td>
<td>Maimeri Linseed Oil, a high-viscosity, alakali refined oil, spreads out the brush stroke, reducing brush marks. It increases the brightness and glossiness of colors. Like all linseed oils, it has a tendency to yellow. It’s housed in a glass bottle.</td>
</tr>
<tr>
<td><strong>Eco-House 910 Light Refined Linseed Oil</strong></td>
<td>This very light, purified linseed oil is made without additives. It’s used as a fine oil painting medium, or as a raw material ingredient.</td>
</tr>
<tr>
<td><strong>Reeves Artist Linseed Oil</strong></td>
<td>Reeves Artist Linseed Oil can be used to thin oil color, increase flow, reduce consistency, and decrease thickness. This medium also increases gloss and transparency. 75 ml (2.5 oz) bottle.</td>
</tr>
<tr>
<td><strong>Gamblin Refined Linseed Oil</strong></td>
<td>Gamblin’s Refined Linseed Oil is pressed from American flax seeds and refined using an alakali process. This low acid oil is about as light and pure as it gets. Use linseed oil to thin oil colors and increase their brilliance and transparency.</td>
</tr>
<tr>
<td><strong>Shiva Linseed Oil</strong></td>
<td>A refined, white linseed oil which contains no free mineral acids, lead, or artificial dryers. It serves to diminish the thickness of paint. The consistency is thinner than that of sun-thickened linseed (stand oil), and the oil may darken with age.</td>
</tr>
<tr>
<td><strong>Grumbacher Linseed Oil</strong></td>
<td>Our professional select alkali-refined linseed oil provides excellent blending and adhesion for the professional artist.</td>
</tr>
<tr>
<td><strong>Weber Linseed Oil</strong></td>
<td>Weber Linseed Oil is widely used in diluting oil or alkyd colors. It is also used in preparing painting mediums, and is even good for cleaning brushes. This fine quality, purified and refined linseed oil is pressed from flaxseed.</td>
</tr>
</tbody>
</table>
Williamsburg Artist Linseed Oil
This is a genuine linseed oil, pressed from flax seeds. Used as a drying oil, it forms a tough, resilient film on paintings.

Winsor & Newton Linseed Oils
Natural oil of low viscosity, pressed from flax seeds without heat. Regular heated linseed oil lacks the purity and clarity of cold-pressed oils.

Winsor & Newton Bleached Linseed Oil
Winsor & Newton Bleached Linseed Oil is a refined pale oil of slightly increased viscosity that improves the flow of colors and dries slightly faster than Winsor & Newton Refined Linseed Oil. It dries slightly slower than Thickened Linseed Oil, and is thinner and paler.

Winsor & Newton Drying Linseed Oil
Winsor & Newton Drying Linseed Oil possesses a darker color than Refined Linseed Oil. It promotes the fastest drying rate of all drying oils while increasing gloss.

Cold Pressed Oils
Gamblin Cold Press Linseed Oil
Gamblin's Cold Pressed Linseed Oil is pressed from flax seeds in Canada without using heat or chemicals. Use linseed oil to thin oil colors and increase brilliance and transparency. Linseed oil increases the tendency of lighter colors to yellow.

Old Holland Bleached Linseed Oil
This cold pressed linseed oil increases fluidity of oil colors and enables brushstrokes to be removed. It enhances the flow, increases the gloss, and lengthens drying time of oil paints.

Old Holland Windmill Cold Pressed Linseed Oil
This cold pressed oil is made from linseeds that have been pressed in a windmill. It enhances the gloss and flow of oil paint, lengthens drying time, and allows brushstrokes to be removed. It can be diluted using turpentine and white spirit.

Williamsburg Artist Cold Pressed Linseed Oil
Extracted through pressure alone, this genuine, cold-pressed linseed oil is less processed than alkali-refined linseed oil and much truer to what was used by early artists.

Winsor & Newton Cold Pressed Linseed Oil
Winsor & Newton Cold-Pressed Linseed Oil is a slightly yellow oil that is extracted without the use of heat. Add it to colors to reduce their consistency, improve flow, and increase gloss and transparency, while reducing brush marks.
**Poppy Seed Oils**

**Daler-Rowney Poppy Oil**
Poppy Oil is a clear oil medium to mix with and reduce white and lighter colours. It is less inclined to yellow than linseed oil, but is slower drying. Enhances gloss and flow, but too high a proportion slows the drying of oil colors.

**Gamblin Poppy Oil**
Slows down drying time. Especially useful for painters using “wet into wet” techniques. Add 10% by volume to slow down the drying time of Gamblin Galkyd painting mediums. 8 oz (237 ml) bottle. AP non-toxic.

**Maimeri Poppy Oil**
Poppy oil has extreme purity and lightfastness. It will not yellow, and it dries slowly. Similar to safflower oil, it is suited for whites and very light colors.

**Old Holland Refined Poppy Oil**
Old Holland Refined Poppy Oil is made from the first pressing of poppy seeds. Used to increase the fluidity and enhance the flow of oil paints, it’s great for use with light colors.

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**Safflower Oils**

**Da Vinci Safflower Oil**
Da Vinci’s Safflower Oil is pure and refined, useful for diluting white oil paints. Using safflower oil to dilute whites, rather than linseed oil, will help reduce yellowing.

**Maimeri Safflower Oil**
Use safflower oil to soften oil colors and make oil paints more fluid. It has similar characteristics to poppy seed oil. It won’t yellow, it dries slowly, and it is particularly suitable for white and light colors.

**Sennelier Refined Safflower Oil**
The finest first-pressed safflower oil, purified to lower acidity while increasing clarity. Use to increase oil fluidity and transparency, or in medium recipes. Won’t yellow or alter pigments’ natural hue as linseed does.
Stand Oils

**Eco-House 912 Linseed Stand Oil**
A light-colored, pre-polymerized linseed oil, adds elasticity and moisture to the paint coat, improving flow and leveling of paints. It has less of a tendency to yellow than plain linseed oil.

**Weber Stand Oil**
This pale-colored, heavy-bodied, polymerized linseed oil improves the characteristics of painting mediums. It’s slower drying than conventional linseed oil, and the performance results include a more durable film with less tendency to after-yellowing.

**Gamblin Stand Oil**
Gamblin’s Stand Oil, manufactured by heating a pure refined linseed oil, is an oil that wets pigments well. Stand oil is linseed oil that has been polymerized by heating. Thicker than cold pressed or alkalai refined oils. Has almost no tendency to yellow.

**Williamsburg Artist Stand Oil**
This thick-bodied, polymerized linseed oil is heated in the absence of oxygen to a honey-like consistency. It levels well and produces an enamel-like sheen.

**Maimeri Stand Oil**
Maimeri Stand Oil is a high viscosity linseed oil, polymerized through heating, that imparts a very glossy texture and allows you to spread out your brushstrokes. Stand oil has very little tendency to yellow. It’s housed in a glass bottle.

**NEW! Old Holland Stand Oil**
This boiled, polymerized linseed oil enhances the flow of oil paints and allows brushstrokes to be removed. An elastic medium, it also enhances gloss and lengthens drying time. It can be thinned using turpentine and white spirit and is suitable for the practice of the glacis technique.

**Winsor & Newton Stand Oil**
Winsor & Newton Linseed Stand Oil is a pale, viscous oil that can be mixed with turpentine or white (mineral) spirits to improve the flow and leveling of oil colors. It retards drying but imparts a tough, elastic finish.

**Shiva Stand Oil**
A medium-viscosity polymerized oil suitable for glazing when thinned with rectified turpentine. It produces harder films with less tendency to yellow than thinned linseed oil. It improves the fluidity and gloss of colors when used sparingly.
**Thickened Linseed Oils**

**Winsor & Newton Thickened Linseed Oil**
A pale refined oil of syrupy consistency. Winsor & Newton Thickened Linseed Oil speeds drying time even more than Winsor & Newton Bleached Linseed Oil. It improves flow and gloss, and increases the durability of the film. This oil behaves like Linseed Stand Oil but dries quicker and darker.

**Grumbacher Sun- Thickened Linseed Oil**
A heavy-bodied purified oil that is thicker than regular linseed oil but not as thick as stand oil. Grumbacher Sun-Thickened Linseed Oil is designed for use in preparing oil painting mediums.

**Holbein Sun- Thickened Linseed Oil**
Still made by the orthodox method of exposure to the sun for prolonged periods, this oil is very heavy and thick, with a viscosity that improves drying, leveling and protective characteristics. Used with oil mediums, varnishes and glazes.

**Weber Process Thickened Linseed Oil**
Faster drying than Stand Oil, this pale, heavy-bodied oil has the properties of a sun-thickened oil. It’s superior to other heat-treated linseed oils when used with painting mediums.

**Walnut Oils**

**M. Graham Walnut Oil**
M. Graham Oil Mediums offer the following excellent quality mediums. Use their specially developed, non-toxic Walnut Alkyd Medium or their classic Walnut Oil.

**Maimeri Walnut Oil**
Increases the brightness of colors. It has similar properties to linseed oil, but it won’t yellow as much. Good drying power.
BIBLIOGRAPHY, SOURCES AND RESOURCES

The following are publications and websites that were used to compile this handbook and are helpful resources to find more detailed information about non toxic art practices.

GREEN GUIDE FOR ARTISTS
Author: Karen Michel
Paperback: 128 pages
Publisher: Quarry Books (June 1, 2009)
Language: English
ISBN-10: 1592535186

THE PAINTER'S HANDBOOK
Author: Mark David Gottsegen
Paperback: 352 pages
Publisher: Watson-Guptill; Rev Exp edition (April 1, 2006)
Language: English
ISBN-10: 0823034968

The Artist's Handbook, fifth edition
Author: Ralph Meyer
Hardcover: 784 pages
Publisher: Viking Adult; 5 edition (May 31, 1991)
Language: English
ISBN-10: 0670837016

WEB RESOURCES

Princeton University Art Safety Training Guide
http://web.princeton.edu/sites/ehs/artsafety/

City of Tucson Health & Safety Guide
http://www.tucsonaz.gov/arthazards/

Gamblin Artist's Oil Colors Studio Safety