

# Materials Explained:

An excerpt from

*The Complete Oil Painter*

by Brian Gorst

MATERIALS 1

# Oil paints

Oil paint consists of dry pigment ground in oil. The oil eases the movement of the pigment particles and allows the pigment to adhere to a surface. It also alters the way in which light is reflected and absorbed, and protects the pigment from chemically reacting with other pigments or the atmosphere.

In order for the paints to intermix and dry consistently, the particles have to be evenly dispersed in as little oil as possible. This is best achieved by experienced manufacturers using multiple roll mills, and the vast majority of artists painting in oils today use prepared paints in either tubes or tins, or both. There are many manufacturers worldwide offering oil colors of different qualities and properties. The industry commonly differentiates between students' and artists' quality paints.

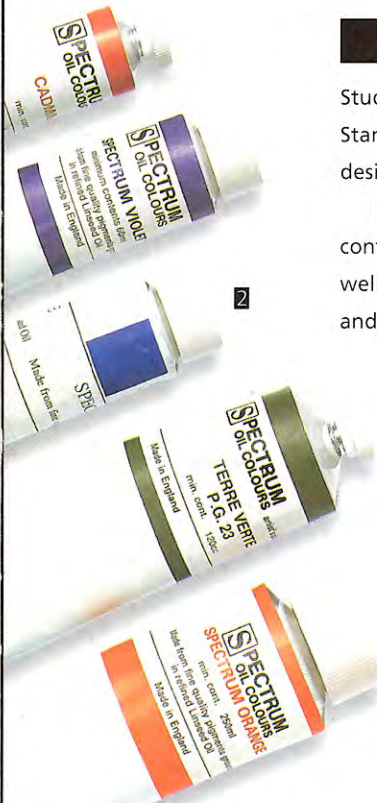


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## Students' quality paints

Students' quality paints offer a varied color range, commonly as part of a starter set, at an affordable price. Standard pigments (sometimes imitations or mixtures) are ground in refined linseed or safflower oil. The paints are designed to have a workable texture with fairly slow, but consistent, drying times throughout the range.

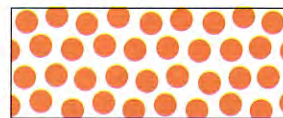
In order to achieve this, and to bulk out the paint to reduce the cost of manufacture, student colors may contain excessive quantities of oil or inert fillers. This can produce colors that do not mix well or tend to yellow, as well as making the paint film less stable, and serious artists will soon find themselves drawn toward more reliable and, in the end, more cost-effective paints.



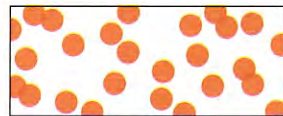
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### PAINT PIGMENT DISTRIBUTION

Poorly mixed paints, or those with excess oil, will dry unevenly and slowly.



Even pigment:oil ratio



Poor pigment:oil ratio

## Artists' quality paints

Artists' quality paints offer the fullest range of colors with high pigment content. Stiffer in texture and with greater tinting strength than students' quality paints, most brands are suitable for general use. More expensive than students' quality paints, they are divided into different price bands depending on the cost and rarity of the pigments.

Fillers and additives are still used to alter the luminosity, texture, or drying time of some colors, and poppy seed or safflower oil is frequently employed in the paler colors in preference to the darker-drying linseed oil.



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\$24.9 U.S.A.

## Handmade colors

The highest quality and most expensive oil paints are those made by specialist paint producers. Often termed “hand-made oil colors,” these paints use only the finest pigments. Sometimes ground in cold-pressed linseed oil, they tend to contain little or no fillers or additives.

You may find that it is more economical and rewarding to accumulate high-quality paints gradually and to mix your own tints and colors from a core of tried-and-tested favorites than to amass a vast range of poor-quality paints that you rarely use.

## Alkyds and water-soluble oils

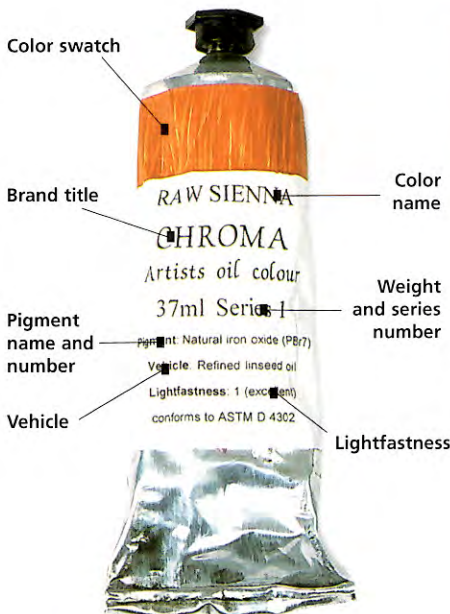
Alkyds are synthetic, resin-based, oil-compatible paints that have shorter drying times than conventional oil paints and produce a sufficiently flexible and strong paint film. They are useful for underpainting and for building up layers and glazes within days, but if alkyds are painted over the top of oils there can be an increased risk of cracking.

Water-soluble oil paints are one of the most recent developments in paint technology, providing a range that can be mixed with specialized oil-rich mediums, using water as a thinner. They are of obvious benefit to people with an intolerance toward the solvents used in conventional oil painting.

Both alkyds and water-soluble oil paints come in smaller color ranges than conventional oils, although accumulating a second set of paint colors may be costly.

### UNDERSTANDING LABELS

Labeling can be helpful but also misleading. Watch out for paints called “hue” or “mixture,” as these are often inferior pigments masquerading as those of a better quality. Always check the pigment number.



In oil paint production, machine-operated mills are used by paint manufacturers to grind large quantities of pigment into oil to make paint.

### TUBES AND TINS

While tubes are easily portable, tins are often preferred for larger paintings worked on in the studio. Constant exposure to air, however, can dry the paint in the tin, making large tubes a more economical option.



- 1 Students' starter set
- 2 Various artists' oil-paints
- 3 Water-mixable oil paints
- 4 Alkyds
- 5 Oil paints in tins



# MATERIALS 2 Pigments



Pigments may be derived from inorganic sources, such as minerals and metal oxides, or from organic sources, such as plant and animal substances. Nowadays there are also many synthetic versions that equal, or even improve on, most of the characteristics of the natural source. There are several aspects of pigments that you need to think about as an artist. Tube labels and manufacturers' color charts will give you a certain amount of information, and first-hand experience of using oil paints will provide the rest.

## TRANSPARENCY/OPACITY

Depending on the size and nature of its pigment particles, a paint mixture may be transparent and allow light to pass through it or it may be opaque and absorb and reflect light. Most manufacturers indicate whether particular paints are transparent, semitransparent, or opaque.

## TINTING STRENGTH

The tinting strength is the extent to which a color maintains its intensity when it is mixed with white. This information is rarely displayed on tubes and varies for each brand and grade of paint. Some pigments may be less intense in color when mixed with white, but still maintain a strong hue when diluted with a medium.

## TEXTURE AND MIXABILITY

Oil paints can be buttery, stiff/short, stringy, oily, rough/grainy, or smooth. These characteristics can be altered through oil control. Often the highest-quality paints offer the broadest range of textures.

## DRYING TIME

The drying time is not usually printed on paint labels. Different pigments have different drying times; in addition, manufacturers add drying agents to slower-drying pigments to give their range a more consistent drying time. Some oil paints can be touch-dry in hours, others can take a week (depending also on thickness of paint, dilution, and ground absorbancy). It is useful to note which colors are driest on your palette at the end of each painting session.

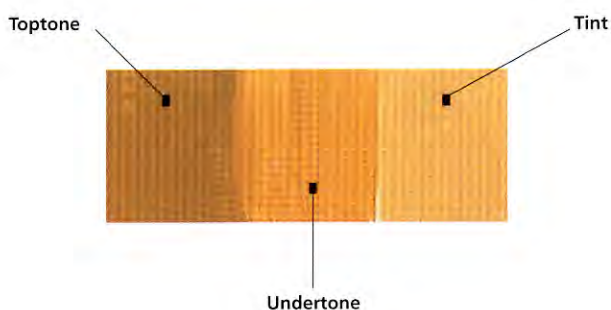
## LIGHTFASTNESS

Lightfastness is the ability of a ground pigment to retain its appearance after prolonged exposure to light. Lightfastness is often given on tubes and color charts as an ASTM (American Society of Testing and Materials) rating, with I being excellent, II very good, and III insufficient for artistic use. However, some manufacturers have their own rating system and do not use the ASTM notation.

The following list sets out the most commonly used pigments and their color index name (a code that is unique to each pigment and which should be present on all paint labels). Unless otherwise indicated, pigments are lightfast and have an average drying time.

## SWATCHES EXPLAINED

Toptone is the paint's solid appearance when applied thickly. Undertone is its transparent appearance when thinned with a medium or painted on a light ground. Tint is the color of the paint as it appears when mixed with white.



## WHITES

**Flake White (PW1)**, also called Cremnitz or Lead White, may be the earliest manufactured mineral pigment. It forms a reliable, opaque, and flexible paint film. It is excellent for underpainting as it dries fairly quickly and produces tints that do not differ too greatly from their original color. Flake White is now supplied in tins rather than tubes because it contains lead.

**Titanium White (PW6)** has only been in use since the early twentieth century. It is a smooth-textured, pure white with an opacity that is useful for solid surfaces and highlights but tends to cool down tints. Its slow drying time makes it ideal for alla prima or plein-air painting.

**Zinc White (PW4)** is a semitransparent, cool white that can be a useful addition to the palette when milky glazes or subtle overpainting are required (for example, in depictions of water, glass, or thin fabric). Zinc White has a reputation for drying to a less flexible paint film than the other whites, which can cause cracking. You will also find combinations called Foundation White, Underpainting White, Opaque White, Transparent White, and Flake White Replacement. These are mixtures of titanium and zinc in differing proportions.



**YELLOWS**

**1 Yellow Ocher (PY43)** is a muted, traditional earth color that is ideal in a limited palette (see Earth palettes, page 41). Yellow Ocher mixes well. It is semi-opaque, yet it can reveal rich undertones in the highest-quality grades. It is often replaced by Mars Yellow (PY42), which is slightly more intense and fractionally warmer.

**2 Raw Sienna (PBr7)** is a reasonably quick-drying earth yellow with a faint bias toward orange. It is darker in toptone than Yellow Ocher but has greater transparency.

**3 Lemon Yellow** is a generic name for green-biased yellow pigments that give an intense opaque or semitransparent color. They are usually slow drying. Often derived from Cadmium (PY35), but Cadmium Barium (PY35:1) and Hansa (PY3) are cheaper alternatives.

**4 Cadmium Yellows (PY35, PY37)** are an intense, opaque, slow-drying family of pigments possessing good tinting strength with rich undertones. They are available as Light, Medium, and Deep, with biases toward green or orange. The Cadmium Yellows can be expensive colors, but they have come to replace the fugitive Chrome Yellows (PY34).

**5 Hansa Yellows (PY3, 65, 73, 75, 98)**, also called Arylide Yellows, are a family of yellows with good tinting strengths and brightness, with a medium-to-slow drying time.

**6 Naples Yellow (PY41)** is a traditional, very pale yellow pigment that is useful in color mixing with earth colors and in flesh tones. It is commonly replicated by mixtures of yellow and white.

**ORANGES**

**7 Mars Orange (PY42)** and Mars Brown (PBr6) are semi-opaque, muted brown-oranges with moderate tinting strengths. They are quicker drying than the more intense colors.

**8 Cadmium Orange (PO20)** is opaque, bright, and intense, with a very slow drying time. It is available in redder and yellower hues. Tubes of genuine cadmiums feel heavier than imitations.

**9 Perinone Orange (PO43)** is a transparent orange with a full, intense color. Benzimidazolone Orange (PO62, PO36) is a semitransparent color of equal intensity. Often marketed under different tube names, they dry quicker than the cadmiums.

**REDS**

**10 Indian Red (PR101)** is a muted red with a violet bias that is useful in limited palettes. Indian Red is one of the family of synthetic iron oxides. It is semi-opaque, with a rich undertone that cools significantly when it is mixed with white.

**11 Light Red Oxide (PR101)**, sometimes called English Red, is another variation on the synthetic iron oxides. The exact name and hue varies

between manufacturers, but they are all reliable semi-opaque pigments in the muted red-orange range.

**12 Cadmium Reds (PR108)** Available as Light, Medium, and Deep, these intense, opaque colors mix well, providing a strong, flexible, slow-drying paint film. The red-orange shades have come to replace the less reliable Vermilion (PR106). Cadmium-Barium Red (PR108:1) provides a less expensive, if slightly weaker, alternative.

**13 Quinacridone Magenta (PR122)** and Quinacridone Red (PV19) are intense, transparent, and economical pigments, with good tinting strengths, that have come to replace such traditional but less lightfast colors as Crimson Lake and Rose Madder.

**14 Alizarin Crimson (PR83:1)** is a slow-drying, transparent red-violet that mixes well with blues to make clear purples. There are doubts as to its lightfastness.

**15 Perylene Reds (PR149)** and \*Naphthol Reds (PR9, PR112) are all semitransparent with intense, bright toptones. They can be biased toward red-orange or red-violet.

**VIOLETS**

**16 Cobalt Violet (PV14)** is semitransparent and available in two shades. Its fast drying time and mild tinting strength make it ideal for use with earth colors.

**17 Manganese Violet (PV16)**, also called Mineral Violet, is quick drying and more opaque and pure than Cobalt Violet.

**18 Dioxazine Violet (PV23)** is an intense, transparent, pure violet with a very high tinting strength. The smallest tube will last a lifetime.

**BLUES**

**19 French Ultramarine (PB29)** is a transparent blue-violet with a rich, intense undertone and good tinting strength. This fairly slow drier is a useful color mixer.

**20 Cobalt Blue (PB28)** is a semitransparent and relatively quick drying blue, with an enigmatic undertone that justifies its high cost.

**21 Cerulean Blue (PB35)** is a blue-green, opaque pigment that can display good undertones. It mixes well to make strong greens.

**22 Manganese Blue (PB33)** is similar to Cerulean Blue in hue, but has greater transparency and a greener undertone. It is sometimes replaced with Phthalo Blue.

**23 Phthalo Blues (PB15)** are a highly intense, transparent range of blues with high tinting strength. Phthalo Blues can sometimes be difficult to control as they tend to dominate mixtures.

**24 Prussian Blue (PB27)** is one of the fastest drying paints. This intense blue-green pigment has a dark, metallic tinge toptone with a rich, glowing undertone. It is a good but dominant mixer.

**GREENS**

**25 Oxide of Chromium (PG17)** is an opaque, reliable, slightly muted green with good tinting strength. Excellent as part of an earth palette, it is used to replace or bulk out the weaker Terre Verte (PG23).

**26 Viridian (PG18)** has a dark toptone but an intense, vivid, cool-green undertone, making it an ideal transparent glazing color with good tinting strength.

**27 Phthalo Green (PG7)** and \*Phthalo Green Yellow Shade (PG36) are both reliable and transparent shades with very intense and dominant tinting strengths. They are used by manufacturers in place of other greens such as Emerald Green, Chrome Green, and the fugitive Sap Green.

**BROWNS**

**28 Burnt Umber (PBr7)** is an excellent traditional, semitransparent, warm brown with a rich, dark toptone. Its quick drying time makes it ideal for use in underpainting and imprimatura.

**29 Raw Umber (PBr7)** is a semi-opaque, dark brown pigment with a cool yellow-green hue that can be useful in earth palettes and landscape painting. It dries fast, which makes it a useful color to apply unmixed in the early layers of a painting.

**30 Burnt Sienna (PBr7)** has a brown-earth toptone that reveals glowing muted orange hues in glazes and mixes. Burnt Sienna is a reliable, inexpensive pigment with a fairly quick drying time.

**31 Venetian Red (PR101)** and \*Mars Red (PR101) are members of the synthetic iron oxide family. Both produce solid brick-brown colors with good all-round properties.

**32 Transparent Red Oxide (PR101)** is a darker and more transparent version of the other iron oxides, perhaps a little more intense than Burnt Umber.

**BLACKS**

**33 Ivory Black (PBk9)**, also called Bone Black, is now made exclusively from charred animal bones rather than from ivory. It is a good economical color, with a dark brown undertone and a very slow drying time. Ivory Black is available mixed with Ultramarine as Blue Black.

**34 Lamp Black (PBk6)** The very first pigment used by man, Lamp Black is an opaque, smooth black with a subtle, bluish undertone. A very slow-drying pigment, it can be useful in paintings made using a limited palette of earth colors.

**35 Mars Black (PBk11)** A dense, opaque black with a neutral-to-brown hue. An average drying time makes Mars Black a good choice for grisaille painting (see Tonal palettes, page 40).



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# Mediums

Medium is the term for the fluid that surrounds the pigment and facilitates its application onto a surface. In the case of oil paints, the medium consists principally of the binder and the thinner and, to a lesser extent, of additives such as varnishes, resins, drying agents, retardants, and textural materials.

## Binders

The binder is the most important element in the medium as this is what adheres to the painting surface, holding the particles of pigment within it and drying to form the paint film. Oil paints by definition have a drying oil as the binder and the tubes of paint that we buy contain the pigment already ground in just enough binder to secure its storage and ease its transfer onto the palette. You need to add further oil binder, within a medium, to the paints on the palette to make them workable with a brush.

**Linseed oil** is the most commonly used drying oil. It is obtained through different processes from the seeds of the flax plant. ("Lin" in linseed has the same derivation as it does in linen, the cloth made from flax.)

**1 Raw linseed oil** is dark yellow in color. It is obtained by pressing steam-heated flax, but is used only as a medium for some industrial paints.

**2 Refined linseed oil** has been in use since the eighteenth century and is refined by temporarily mixing the hot-pressed oil with sulphuric acid and water. A good economical oil of varying light-to-golden color, refined linseed oil is the standard binder in most tubed paints. The paler refined linseed oils do not necessarily dry lighter than those of a straw-colored hue.

**3 Cold-pressed linseed oil** is probably the finest and most traditional of the linseed oils, and it is still used to grind some of the highest-quality oil colors. It has excellent handling and dries faster than refined oil, forming a strong, secure paint film. However, its high cost can make it uneconomical for larger-scale or more experimental work.

**4 Stand oil** is a thick, syrupy oil made by polymerizing linseed oil through sustained heating. It can be diluted into a pale and fairly slow-drying medium that has good glazing and handling potential and little tendency toward yellowing. Used in larger quantities or with linseed oil, stand oil has good leveling properties, which leave an enamel-like film when painted on a smooth surface, such as wood panel or copper.

**5 Sun-bleached linseed oil** is used mainly as a glazing medium because of its fast drying time and pale color. It can be of use in paintings with very pale colors.

**6 Walnut oil** dries faster than poppy oil but has little advantage over linseed oil.

**7 Poppy oil** is pressed from poppy seeds. It is very pale, thin, and almost odorless, and has a buttery consistency within paint. Its long drying time can be of use in sustained wet-into-wet painting. Poppy oil may be prone to cracking with age.

**Safflower oil** is increasingly used by manufacturers and gives paint a buttery texture. Its long-term effects on the paint film have yet to be ascertained.



## Thinners

If paint is diluted with oil alone it may wrinkle, become yellow, or take too long to dry—and so a thinner is mixed with the binder in the medium to help aid the flow of the paint. The thinner does not remain in the paint film but evaporates from the surface. The solvent nature of the thinner is sometimes useful to “cut” through wet or drying paint to return to the ground during underpainting.

Too much thinner in the medium, however, can leave the pigment poorly protected and the paint film weak and prone to cracking. The ratio of binder to thinner depends on many factors: the absorbency of the surface and pigments; the extent to which you want to manipulate the paint; the amount of glazing, layering, or reworking needed in the painting; and the quality of the paints.

**1 Distilled turpentine**, the distilled resin of pine trees, has been the standard companion of linseed oil in painters' mediums for centuries. Its purity means that it evaporates fully from the painted surface at an agreeable rate, without leaving any residue. It can be expensive to use in large quantities and so should not be used for cleaning brushes. Its strong odor can be unpleasant, especially in unventilated areas, but you can minimize this by storing it in small containers and dippers with narrow openings. Contact with the skin should be avoided.

**2 Artists' mineral (white) spirit** is a petroleum product sharing many properties with turpentine. A good-quality mineral spirit can be used in place of distilled turpentine as a cost-effective thinner, particularly in larger works and

in underpainting. However, it is not as strong a solvent, and can leave the paint surface matte.

**3 Odorless thinners** and thinners such as the orange-smelling sansodor have become more popular in the wake of tighter health-and-safety laws and consumer demand. They should be used in the same way as artists' mineral spirit.

**4 Household mineral (white) spirit/turpentine substitute** can be used for some modern, large-scale painting procedures, but it is not generally suitable for painting because it leaves a residue. It is best restricted for use in cleaning brushes and other equipment.



## Additives

Although a simple mixture of linseed oil and turpentine serves most needs, throughout history painters have added substances to their medium in order to modify its behavior. Resinous varnishes are traditionally used to alter the finish, transparency, or handling of the paint. Other additives can directly affect the drying time, the matteness, or the texture of the paint. Remember that an overcomplicated medium may negatively affect the structural integrity of the paint film.

**1 Venice turpentine** is a resin balsam from the larch tree and is said to have been used by Rubens. It is commonly added to glazing mediums and increases the gloss of the paint. It can retard the drying rate of the medium.

**2 Damar varnish** is a clear resin dissolved in turpentine that can increase the transparency of glazing mediums. As it is one of the main components in protective varnishes, it should be used in only small amounts in a glazing medium, otherwise the glaze may be accidentally removed when the painting is cleaned.

**3 Stand oil** see entry opposite.

**4 Oil of spike lavender** should not be confused with the perfume: this oil is distilled from the broad-leafed spike variety of lavender. It can be used as an alternative to turpentine (useful for people with an allergy to turpentine), but it is more expensive and slower drying.

**5 Oil of cloves** placed on a fresh blob of oil paint will retard its drying time considerably—a few drops will suffice. This is a useful way of preserving a complex color mixture on the palette, but overuse may affect the structure of the paint layer.

**6 Liquin** is a useful and well-proven alkyd resin that can be mixed with the medium in generous quantities to shorten the drying time significantly. It is excellent in glazes, improves the flow of the paint, and increases the flexibility of the paint film. It may not always mix quite as easily with oil tube colors as other varnish mediums.

**7 Pure beeswax** can be mixed with warm turpentine or applied ready-made as a premixed, cold-wax medium. It produces a matte finish and can increase the thickness of the paint. Pure beeswax is useful in modern, abstract techniques where illusionistic effects are less important.

**8 Textural substances**, such as gels, beeswax, sand, and sawdust, are often added to the paint. Some gels aid the thickness and drying time of the medium in order to achieve impasto effects. Other additives are used simply to give physical mass. Textured paint, which is used in many abstract and mixed media approaches, is usually applied with a palette knife.



# Supports

The support on which you paint your picture must be able to take a ground or size and to remain flat, without warping, shrinking, or deteriorating over time.

## Stretched canvas

The most widely used support for oil paintings over the last 400 years has been the stretched canvas. Its popularity is down to the ease with which a canvas of any size can be manoeuvred and the cost-effectiveness of the material. (The term “canvas” is used to describe the fabric, the stretched support, and the finished piece of art itself.)

Many artists find that the springy nature of stretched canvas adds an extra subtlety to their touch and its texture can transform paint strokes into scumbles of broken color (see page 64). Canvases are, however, vulnerable to damage from the front and back and, if not properly prepared before painting, the fibers of the canvas can be corroded by the oil paint. (See Sizing a canvas, page 114.)

Canvas is available in a number of different weights—portrait and fine grain, medium grain, and coarse or heavy grain. It can be bought by the yard, both primed and unprimed, and is commonly sold ready stretched on standard-format stretcher bars. Stretcher bars have to be made of seasoned timber so that they do not warp or twist. They are sold in pairs and larger-sized stretchers have one or more crossbeams. (See Stretcher bars, page 113 and Stretching a canvas, page 113.)

## Cotton and linen canvas

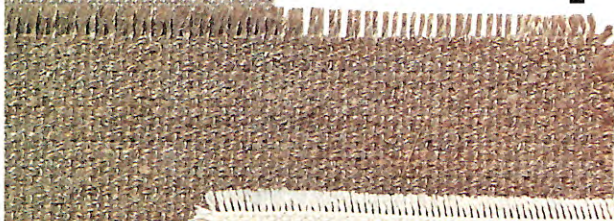
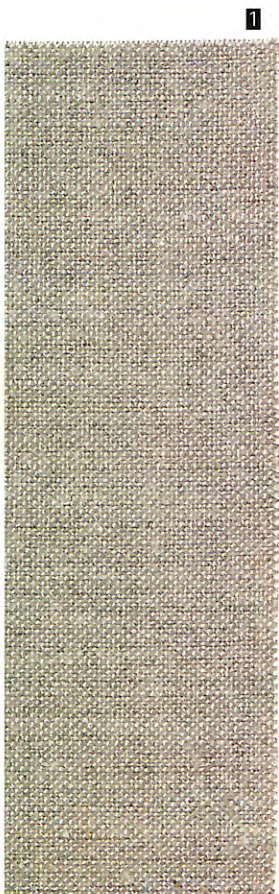
**1 Linen** is the more expensive of the two, but it has some advantages over cotton. The fibers of the flax plant, from which linen is made, are considerably longer than cotton fibers, forming a fabric with greater strength that is less likely to stretch and sag over time. Natural oils in linen also prevent it from becoming brittle in the way that cotton fiber is prone to do. All-linen canvas is gray-brown in color. (If enough size is applied, this color can create an interesting painting surface without the need for a ground.)

**2 Cotton** is less expensive than linen and so has become the most popular canvas fabric. Cotton Duck is the canvas of choice for most manufacturers of ready-made stretchers. The weave of the cotton has a more mechanical feel to it than linen, and it is also a little less naturally receptive to applications of grounds.

The pale, straw color of cotton gives a bright and uniform surface that can be pleasing to paint upon if sized but unprimed, and despite its possible long-term weaknesses, cotton is a surface that is suitable for most general needs.

**3 Flax** can refer to the heaviest coarse linen. Once favored by the great sixteenth-century Venetian artists, Titian and Veronese, flax is today limited in use mainly to some large or textured abstract work. The sacking material called jute is also used in this way. Both flax and jute must be securely sized to protect their loose weaves.

**4 Calico** is a type of cotton fabric; it is lighter than most cottons used for canvases. It can be a pleasant surface to paint on when it is sized and it is strong enough for small-scale work.





## Rigid supports

Panels and boards made from natural or processed wood provide solid surfaces to paint upon and the smooth surface can be of use to those striving for detail. These supports are ideal for smaller works. Larger sizes of wood or board may need batoning or cradles attached to maintain their flatness, and this can make them inordinately heavy compared to stretched canvases. (See Preparing boards and panels, page 115.)

**1 Wooden panels** predate canvas, and the eternal smile of the *Mona Lisa* attests to their permanence and suitability as a support. Oak, poplar, and mahogany have all been used by artists, although the complex techniques involved in seasoning, cradling, and gessoing the wood mean that most panels were prepared by specialists. Prepared wooden panels are still available, providing a smooth, secure surface; and antique furniture is probably the best source of seasoned, untreated, wood.

**2 Plywood** is made up of thin sheets of wood bonded with alternating directions of grain, making a strong panel that (in the higher qualities) is less susceptible to warping than wood. Its suitability for painting depends on its quality of manufacture, its age (the older the better), and the smoothness of its outer panel. Plywood is a lighter alternative to wood panel.

**3 Masonite** (also known as hardboard) is a thin panel made of compressed wood pulp. It is very useful for small painted studies and miniatures. It is better to paint on the flat, shiny side than on the embossed, woven reverse, which can tend to dominate any picture painted upon it. Masonite can be cut with a knife, making it convenient for those without the space or tools for sawing. It is prone to warping after priming, but this can be controlled by painting an "X" from corner to corner on the reverse, which cancels out the effect by making the board warp both ways.

**5 Medium-density fiberboard (MDF)** is probably the most efficient of all the boards and panels. It has a smooth surface and is moderately priced, with a proven ability to remain very flat and rigid over time. Although there is little need for batons, MDF panels can be quite heavy and so the thinner  $\frac{1}{4}$ -in. (6mm) and  $\frac{1}{2}$ -in. (1cm) thicknesses are recommended for artistic use. Care should be taken when sawing MDF (see Health and safety, page 123).

**4 Mass-produced canvas boards** combine the texture of canvas with the convenience of boards, and their low cost and ready availability in art stores make them popular. Lightweight and thin, they are convenient for sketching out of doors and student work. However, the cardboard underneath the low-quality cotton fabric can absorb moisture, causing warping and loss of rigidity.

**5 Covered panels** are, as the name suggests, Masonite or MDF panels covered with calico or off-cuts of canvas. Inexpensive to make, they overcome many of the drawbacks of canvas panels.

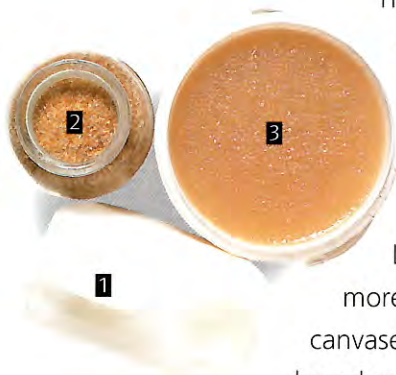
**6 Metal** is particularly compatible with oils. Copper, zinc, and aluminum are all recommended surfaces, as they are extremely rigid and smooth, making them particularly suitable for highly detailed work. The cost and weight can be prohibitive for large-scale work, but sheet metal is the only support that does not need an application of size or ground before painting.

**7 Paper and card** can be used for oil paint, but they must be protected from the paint layer with size and ground or an acrylic-based primer. You can do this yourself or buy pads of ready-primed paper. Finished paintings on paper can be glued on to boards and framed as panels.

**8 Some plastics** are now used to make drafting film, which is rather like tracing paper. This is a pleasant, smooth surface for sketching in oil that is inert to the corrosive action of the linseed oil.



# MATERIALS 5 Grounds



The ground or “priming” is an impervious layer that separates the support from subsequent paint applications. A ground strengthens and evens out the canvas texture and provides a luminous or colorful base on which to paint. “Ground” refers to the dried surface, while “primer” most often refers to the liquid paint that achieves this; the two terms are used in close conjunction and are almost interchangeable.

Grounds can be oil based or acrylic based and both are suitable for oil painting. Lead White is the pigment traditionally used in oil-based grounds, but Titanium White is more commonly used for commercially prepared oil and acrylic grounds and ready-primed canvases. Alkyd-based ground is also available, and should be used in the same way as oil-based ground in all but drying time. (For the use of colored grounds, see page 117.)

## Sizing canvas

When you use stretched canvas, you must apply a coat of size before you apply the oil ground. This prevents the oil from both the ground and the painting corroding and rotting the fibers of the canvas. The size layer must have a neutral pH value. It must also be thin enough to penetrate the canvas weave without flowing through it and be at least as flexible as the paint film.

Rabbit-skin glue is the size traditionally used in oil painting. Although preparing and applying this size can take practice, it provides a cost-effective and proven barrier between paint and support (see Sizing a canvas, page 114). Acrylic size is simpler to use but it is more expensive and does not have such a proven track record of compatibility with oils. PVA or white glue should never be used as a size on canvas as it can become very brittle and unstable over time.



### SIZES

- 1 Acrylic size
- 2 Rabbit-skin glue granules
- 3 Ready prepared rabbit-skin glue

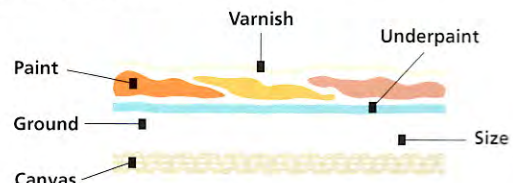
### PRIMERS

- 4 Acrylic gesso
- 5 Acrylic primer
- 6 Gesso
- 7 Oil primers



### CROSS-SECTION OF A PAINTING

The diagrams below show cross-sections through pictures made on board and canvas. Notice how the canvas weave may encourage a heavier paint film on this type of support while the ground layer needs no sizing on the wood panel.



BOARD

## Priming canvas

Oil ground should be applied as a single, solid coat, using a wide, stiff brush or a large palette knife to drive the primer into the weave (see Priming, page 116). Freshly oil-primed canvases need to dry for around three months before use, which is perhaps their greatest drawback, but they provide the most reliable surface to paint upon. An oil ground allows the paint to move freely across the surface and to adhere well to it when it is dry, while at the same time preventing the surface from absorbing excessive amounts of oil from the paint.

An acrylic ground creates a flexible barrier between the paint layer and the canvas without having any adverse effect on the canvas fibers. This means that it can be used without a size layer. (An acrylic size may help an acrylic ground to adhere to linen canvases, but an acrylic ground does not adhere well to rabbit-skin glue.)

Acrylic grounds dry in no more than a day, but the surface that is produced is not ideal for oils. It can at times be too absorbent and contribute to "sinking" in areas; at other times, the surface may be too shiny and repel the paints.

Acrylic grounds are not as consistently reliable as oil-primed grounds and the artist should therefore monitor the use of oil in the medium.

Acrylic grounds are sold as "acrylic primer" and "acrylic gesso." The two products are very similar, although acrylic primer tends to be less absorbent and less matte than acrylic gesso. True gesso, traditionally employed as a ground for tempera, is too inflexible to be used in priming canvases.



- CANVAS**
- 1 Bare canvas
  - 2 Sized canvas
  - 3 First coat
  - 4 Second coat
  - 5 Colored ground

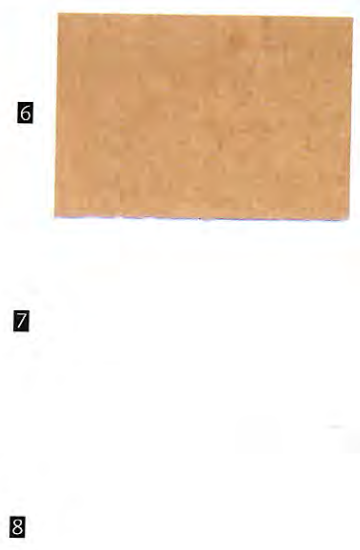


## Priming rigid supports

Most wooden supports need to be sanded until smooth, whereas Masonite needs to be sanded to roughen its shiny surface. Acrylic primer is especially suited to the priming of wood and board panels and is best applied in a series of decreasingly diluted coats with a good-quality, soft, decorating brush, according to the manufacturer's guidelines.

True gesso ground (a combination of glue size and white filler) has a long tradition of use, particularly with tempera and gilding techniques, but it is too absorbent for most underpainting techniques in oil.

Oil primer can also be used on rigid supports, with varying degrees of success, and a size layer is recommended to prevent overabsorption of the oil content. An alkyd-based size is a faster-drying alternative to oil, producing a satisfactorily absorbent surface on rigid supports. The use of PVA or white glue as a size on rigid supports is not recommended as it has a tendency to trap air bubbles, discolor, and become brittle over time.



- WOODEN SUPPORT**
- 6 Bare wood
  - 7 Primed first coat
  - 8 Primed second coat

EQUIPMENT 1 

# Brushes

It is through the narrow length of a paintbrush that the sensitivity, expression, and perception of the artist must travel. The choice of brush will affect the style and finish of the painting, as well as the speed of its completion and the artist's enjoyment of the process.

A paintbrush consists of a handle, a ferrule, and the fibers. Production of brushes and particularly the selection and shaping of the fibers is a skilled task. A good oil-painting brush should have fibers that are hardwearing, secure, and tight fitting; a firmly attached, seamless, metal ferrule; and a long, strong, sealed handle.

**1 Hog bristle** is the most common and useful fiber for oil-painting brushes, particularly on textured surfaces such as canvas. The durable bristles have a lot of "spring," allowing them to hold their shape, and the thickness of the fibers increases the paint-holding potential.

A hog-bristle brush can apply a lot of paint quickly to a broad area and so is perfect for underpainting and all large-scale work. Most bristle fibers have a unique split end and the finest quality brushes exploit this with a firm body below a surprisingly soft tip.

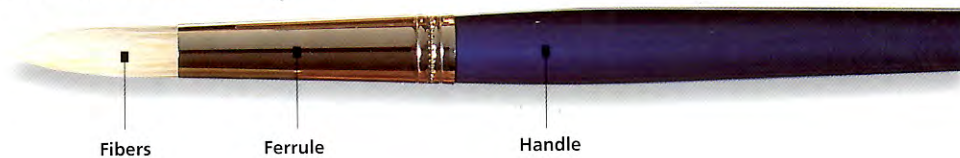
**2 Sables** are more often used in watercolor painting, but they can also be of use in oil painting. The thin, fine-tipped hairs are good for fine detail, particularly on smooth surfaces, such as panel or metal.

Sable brushes tend to hold on to their paint load and are not ideal for moving oil paint around the canvas. They are the least hard wearing of all the fibers and can lose hairs from around the edge of the ferrule if they are overused. Kolinsky sable is renowned for its ability to retain a point; but there is a wide difference in quality across the range of sables.

**3 Synthetic/sable blends** offer a softer, more absorbent, version of the nylon brush but the fibers may deteriorate at different rates. (Squirrel, badger, and ox hair are also used, all possessing similar qualities to sable and synthetic fiber brushes.)

**4 Synthetic fibers**, such as nylon, offer a cheaper alternative to sable that (for the oil painter) can be equally useful. They tend to have the fine hair width of sable combined with the greater spring of hog bristle, and if properly maintained will last well.

## THE OIL-PAINTING BRUSH



1

2

3

4

## Care of brushes

Fully clean brushes after each painting session—first on a rag, then in mineral (white) spirit, and finally in warm water with soap. Then rinse the brushes, squeeze out the water, and lay them out flat rather than upright to prevent moisture from entering the ferrule and loosening the hairs. (You can maintain the shape of rounds by using a spiral of thread, as in the illustration.)

Do not leave brushes in jars of mineral spirit, as this will encourage the fibers to splay out and increase the release of fumes into the studio. Brushes should not dry within a painting session; if you wrap them in a plastic bag to limit oxidization, they can be stored overnight without lasting damage.



## Shapes of brushes

It was the introduction of the metal ferrule, in the nineteenth century, that allowed brush makers to shape brushes more consistently. Today there are four principal shapes of brush for standard easel painting: round, flat, bright, and filbert. Depending on the technique, finish, or scale of a picture, some specialist brushes may also be useful. (For priming and varnishing brushes, see Studio equipment, page 110).

**1 Rounds** are the most traditional shape of brush and have been the principal oil-painting tool throughout history. The fibers are gathered in a circle, with the natural curve of the hairs pointing inward. A round brush holds the paint well and creates understated, rough-ended marks that are ideal for traditional illusionistic (blended) painting.

**2 Flats** hold the paint well, but the fibers can easily splay apart in the non-bristle versions if the brushes are not well kept. Flats are useful for creating an even, one-touch style in alla prima painting and for clean-edged marks.

**3 Brights** are shorter versions of the flat brush, and are often used by colorists, as they can create controlled, calligraphic, slab-like marks across the surface. As a bright does not hold much paint, it can be useful in controlling wet-on-dry scumbling, but the shortness of the fibers can make it difficult to clean.

**4 A filbert** is a good, general-purpose brush, shaped somewhere between a flat and a round, and sharing some qualities of both. The filbert has a dab-like subtle stroke and a linear quality when used on its edge. This flexibility makes it useful for depicting flowing subjects, such as cloth, trees, and the human form.

**5 Designer brushes** are short-handled, narrow rounds, usually sable or nylon, used for fine details in the later stages of a painting.

**6 Riggers** are narrow and long rounds of sable or nylon, and are invaluable for painting the thin lines found in branches, buildings, clothing, and so on. Liners are signwriting brushes for a similar use, but with a chiselled tip.

**7 Blending or "fan" brushes** are used dry, without being loaded with paint, to blend two or more areas of wet paint into a smooth transition or to remove the brushstrokes from an application of paint.

**8 Decorators' brushes** are used for painting on a large scale. Good-quality house-painting brushes are convenient and inexpensive. They are effectively flats with short handles; also available are "continental" decorators' brushes, which are large rounds with longer handles.



# Palettes



Using a palette allows you to have your paints and medium immediately to hand. This encourages speed and spontaneity, and frees you to concentrate on your painting.

A palette may be made of wood and held on the arm, or of a piece of thick plate glass and mounted on a table or movable trolley. Many painters work from a combination of both. It is good practice, particularly when using a small range of colors, first to mix as many colors and tints as possible on a glass sheet, using a palette knife, before transferring them to a portable palette. Plastic palettes are not recommended, because of the corrosive nature of the thinners used in oil painting.

## Shape of palette

The traditional oil-painting palette is large and kidney shaped, with a thumb hole and an inlet for brushes to stick through. The shape allows you to hold the palette close to your body, resting on your arm. The thumb hole is placed to give better balance; large palettes often have weights on the inner edge for this reason.

Smaller palettes tend toward an ellipse shape, giving a larger mixing area, or sometimes a paddle shape. Rectangular palettes are primarily designed to fit specific painting boxes (in which they may be carried with wet paint still laid out), but they are also useful shapes for the studio. Disposable tear-off palettes are adequate, but they do diminish the pleasure to be had from finding one's own favorite palette, and the gradual accumulation of oil-coated papers in the trash can is a potential fire hazard.

## Color of palette

The color of a palette is an important and yet often overlooked aid to efficient color mixing. Ideally, a palette should be the same hue and tone as the ground of the canvas on which you are painting. If you paint on a variety of grounds, a neutral, mid-toned gray is probably the best option, with a spare white palette for glazing work. This may involve having to cover a beautiful wooden surface with gray paint and then applying several coats of yacht varnish, sanding between coats to achieve a perfectly smooth neutral surface. Glass palettes can be transformed by slipping pieces of paper underneath that correspond to the color of the ground being used.



## Palette care

Clean your palette after every painting session. This not only keeps the palette in good working order, but also allows you to reconsider the arrangement of colors and mixtures each day. If, for continuity, you need to keep color mixtures from one painting session to the next, transfer them to glass and cover them with plastic.

If a palette becomes encrusted in dried paint, it is best to remove the whole surface with a water-based paint stripper and prepare the surface anew, either by oiling down the wooden surface or by painting and then varnishing.

## Dippers

Dippers or "pans" are attached to the side of the palette to provide easy access to mediums and solvents. They are available in metal or corrosion-proof plastic, and the screw-top versions are particularly suitable for painting outdoors. Dippers should be an appropriate size for the palette and brushes, with small openings to prevent evaporation of thinners, and they should be placed away from the main color-mixing area of the palette. To avoid confusion, place a premixed medium of oil and thinner in dipper 1 and use it solely to dilute paints; place a solvent, such as mineral (white) spirit, in dipper 2 and use it only occasionally to clear a brush of paint that cannot be removed by wiping it on a rag.



## Other useful equipment

**1 Palette knives** are used for mixing, applying, and removing paint, and are available in a variety of shapes and sizes. They should have a well tempered blade that is thin but flexible and firmly attached to the handle. A good-quality palette knife outlasts most brushes and is a good investment.

The standard palette knife is long, flat, and flexible with a rounded end; there is sometimes a crank in the blade near the handle to give more clearance for the fingers. Large knives are used for applying oil grounds to canvas, while smaller ones are ideal for mixing paint on glass.

**2 Painting knives** are always cranked, with a narrow shaft leading to a leaf-, trowel-, or lozenge-shaped blade. They are primarily designed for applying paint in an impasto manner, but their shape makes them ideal for mixing gradated tints, in small quantities, on the palette or glass.

**3 Rags** should be constantly at hand, ready to mediate between brush, palette, and painting. Ideally, use a lint-free, absorbent material such as an old washed cotton shirt that will not release fibers into the paint film. A rag can be a vital drawing tool during the underpainting stage, wiping back paint to reveal the ground layer.

**4 A mahl stick** helps to keep a steady hand away from the picture surface when you are painting details or areas surrounded with wet paint. There is really no reason to buy a mahl stick; simply tie a cloth bundle to the end of a cane. Remember that the end of the mahl stick should rest on the edge of the picture, not on the stretched canvas surface. With practice, you should be able to manage a mahl stick, a palette, brushes, and a rag all in one hand (see Painting position, below left).



### PAINTING POSITION

The painter above has leant the easel forward to minimize glare, and is resting the mahl stick on the edge of the picture to work on a detail. During general painting the brushes are best held closer to the end of the handle in order to keep a greater distance between painter and picture.



## Rigid supports

Panels and boards made from natural or processed wood provide solid surfaces to paint upon and the smooth surface can be of use to those striving for detail. These supports are ideal for smaller works. Larger sizes of wood or board may need batoning or cradles attached to maintain their flatness, and this can make them inordinately heavy compared to stretched canvases. (See Preparing boards and panels, page 115.)

**1 Wooden panels** predate canvas, and the eternal smile of the *Mona Lisa* attests to their permanence and suitability as a support. Oak, poplar, and mahogany have all been used by artists, although the complex techniques involved in seasoning, cradling, and gessoing the wood mean that most panels were prepared by specialists. Prepared wooden panels are still available, providing a smooth, secure surface; and antique furniture is probably the best source of seasoned, untreated, wood.

**Plywood** is made up of thin sheets of wood bonded with alternating directions of grain, making a strong panel that (in the higher qualities) is less susceptible to warping than wood. Its suitability for painting depends on its quality of manufacture, its age (the older the better), and the smoothness of its outer panel. Plywood is a lighter alternative to wood panel.

**2 Masonite** (also known as hardboard) is a thin panel made of compressed wood pulp. It is very useful for small painted studies and miniatures. It is better to paint on the flat, shiny side than on the embossed, woven reverse, which can tend to dominate any picture painted upon it. Masonite can be cut with a knife, making it convenient for those without the space or tools for sawing. It is prone to warping after priming, but this can be controlled by painting an "X" from corner to corner on the reverse, which cancels out the effect by making the board warp both ways.

**3 Medium-density fiberboard (MDF)** is probably the most efficient of all the boards and panels. It has a smooth surface and is moderately priced, with a proven ability to remain very flat and rigid over time. Although there is little need for batons, MDF panels can be quite heavy and so the thinner  $\frac{1}{4}$ -in. (6mm) and  $\frac{1}{2}$ -in. (1cm) thicknesses are recommended for artistic use. Care should be taken when sawing MDF (see Health and safety, page 123).

**4 Mass-produced canvas boards** combine the texture of canvas with the convenience of boards, and their low cost and ready availability in art stores make them popular. Lightweight and thin, they are convenient for sketching out of doors and student work. However, the cardboard underneath the low-quality cotton fabric can absorb moisture, causing warping and loss of rigidity.

**5 Covered panels** are, as the name suggests, Masonite or MDF panels covered with calico or off-cuts of canvas. Inexpensive to make, they overcome many of the drawbacks of canvas panels.

**6 Metal** is particularly compatible with oils. Copper, zinc, and aluminum are all recommended surfaces, as they are extremely rigid and smooth, making them particularly suitable for highly detailed work. The cost and weight can be prohibitive for large-scale work, but sheet metal is the only support that does not need an application of size or ground before painting.

**7 Paper and card** can be used for oil paint, but they must be protected from the paint layer with size and ground or an acrylic-based primer. You can do this yourself or buy pads of ready-primed paper. Finished paintings on paper can be glued on to boards and framed as panels.

**8 Some plastics** are now used to make drafting film, which is rather like tracing paper. This is a pleasant, smooth surface for sketching in oil that is inert to the corrosive action of the linseed oil.

