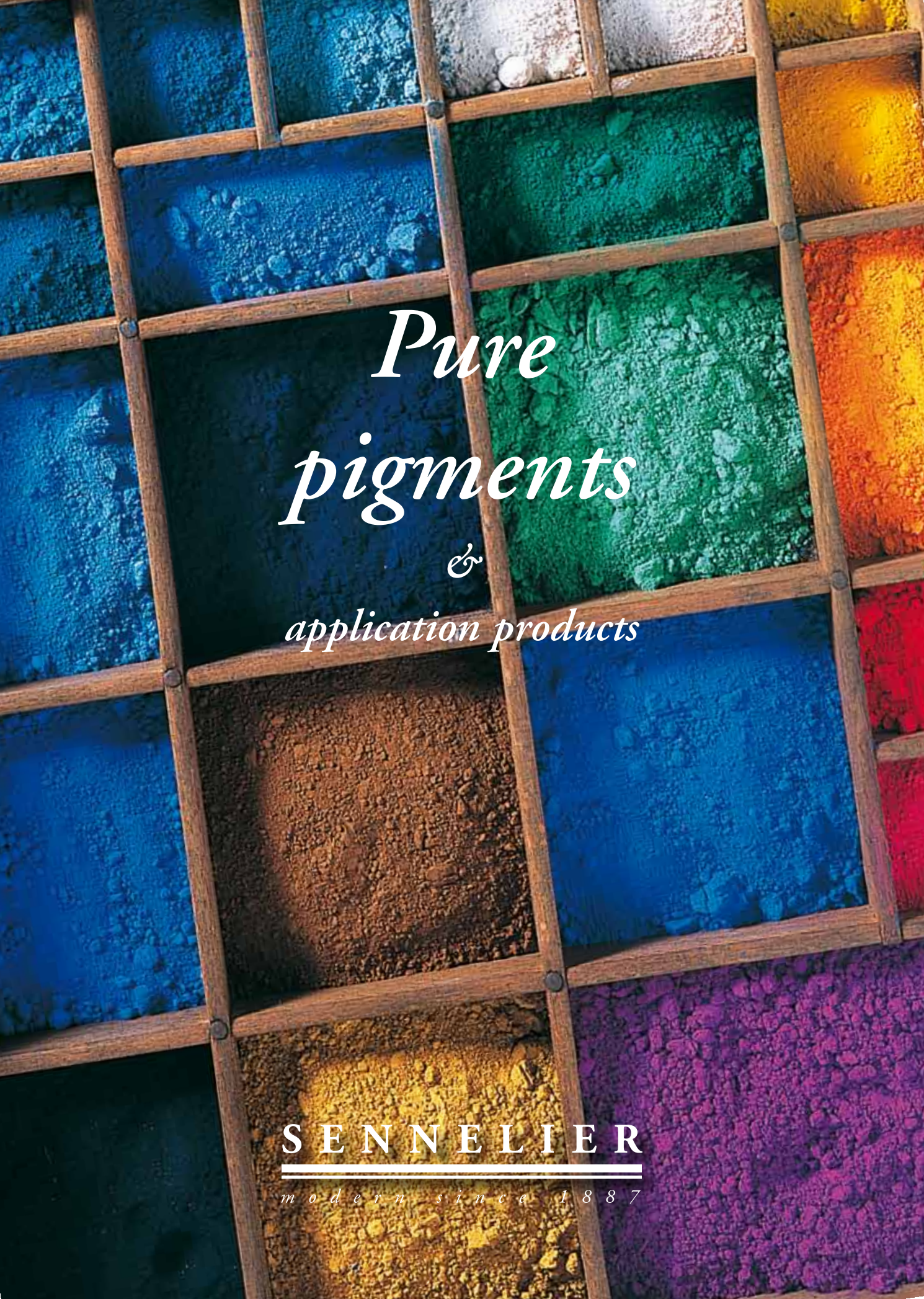


Pure pigments

&

application products

SENNELIER

modern since 1887

When Gustave Sennelier was preparing the first oil colours for use by his artist customers at the end of the 19th century, he understood that they needed to be produced using the very best quality pigments, which had to come from carefully checked sources and have very specific chemical properties. Adhering to these standards ensured in the end that the original hues were preserved and that the artists' works would stand the test of time.

Even though many pigments are no longer with us nowadays, either because we have exhausted the natural resources from which they were made or because they have been banned as a result of their toxicity, the market still offers a very wide range of synthetic pigments which equal the performances of early mineral pigments such as lapis lazuli, cinnabar, etc.

Of course, we still mine various kinds of earth which include substances produced by the effect of natural elements on certain minerals - for instance, ochres are aluminium silicate clays dyed by iron oxides. Finally, certain "burnt" earth colours are produced by the charring of the original earth.

Today we at Sennelier still keep a very close eye on the selection of the pigments we use in our own products such as extra-fine oils and watercolours, soft and oil pastels, and these are exactly the same pigments that we make available to artists, thus giving them total control over the way that they prepare their colours for a specific purpose.

This brochure provides the basic information you will need to use pigments with the appropriate binding agents; in other words this is in itself a key stage in the creation of the artist's work.

Whites

Lithopone White
Zinc sulphide and barium sulphate. This was invented by the French chemist de Romanange in around 1860. It brightens the shades and is often used to prepare coatings.

Blanc de Meudon or Marly White
A natural chalk carbonate. It is a soft natural filler used to make water-based coatings. Often used with Lithopone white.

Titanium White
An "Anatase" quality titanium dioxide. Very lightfast. A very opaque, very covering white. It can be mixed with all pigments and can be used either with oil or with water-based binding agents. It is the most recent member of the white pigment family, dating back to around 1915, and is currently the most widely used.

Zinc White
Zinc oxide has been used for painting ever since it was promoted by the French chemist Courtois back in the 18th century. It can be mixed with all pigments and produces a not particularly covering white which is best used in thin coats or velatures. It is used especially with oil, gouache and watercolours. Suitable for fresco work.

Blacks

Strictly speaking there is no such thing as pure black. Anything which appears to be coloured black has the ability to absorb all the rays of white light.

Ivory Black
This comes from the charring of animal bones in a vacuum; it is no longer made from ivory as used to be the case. It produces a warm, intense black which turns brownish when mixed with whites. Very good lightfastness. When used for oil painting it requires a high percentage of binding agent. Does not dry well. Used for all techniques. Black for Fresco is preferable for fresco work.

Black for Fresco
Soot black. This black is mainly used for the fresco technique and, indeed, this is what it is primarily designed for. Very lightfast. However, there is no reason why it cannot be used with other painting techniques.

Mars Black
Iron oxide. A synthetic black offering total lightfastness. Can be used to create cool greys and can safely be used for all techniques, including fresco work.

Ochres

Ochres have been known to Mankind since ancient times. These are coloured clays containing iron oxide which are found in the earth and usually come from France or Italy. These natural pigments :
- are perfectly lightfast
- can be used for all techniques
- are recommended for fresco work (except for brown ochre)

NATURAL OCHRES
Yellow Ochre
Natural earth of a slightly transparent warm yellow colour.

Red Ochre
Produced by the charring of yellow ochre.

Brown Ochre
An artificial hue made from natural earth and synthetic pigment. Not recommended for fresco work.

SYNTHETIC OCHRES
Light Yellow Ochre
Also known as rutile chrome yellow, this is a slightly ochre-tinted yellow-orangy colour. This pigment offers very good lightfastness.

Gold Ochre
Also known as Rome yellow, this is a zinc ferrite. It is very heat-resistant and offers very good lightfastness. The colour produced is an ochre-golden yellow.

Browns

Madeira Brown
A transparent azo pigment and mineral fillers. A very intense reddish brown. Very high colouring strength. Good lightfastness. Suitable for all techniques. Not recommended for fresco work.

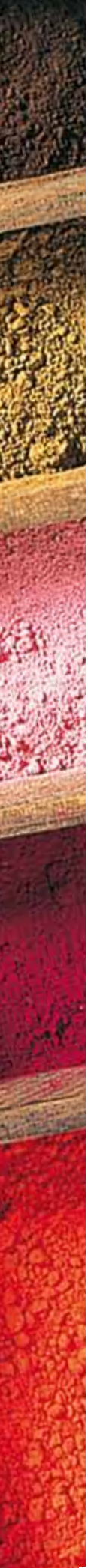
Red Brown
Iron oxide. A covering brown. Very lightfast and stable in mixtures. Suitable for all techniques. Recommended for fresco work.

Van Dyke Brown
Manganese oxide. Purplish brown. Very lightfast and stable in mixtures. Suitable for all techniques including fresco work.

Earths

Natural earths
All of the sienna, umber and green earths are made from natural sources - indeed we source them from Italian quarries. These are natural iron oxides and offer remarkable lightfastness and solidity in mixtures. The so-called "burnt" hues are produced via the charring of natural earth. The natural sienna and umber earths require a high percentage of oil. All earths are prone to drying by nature, so you must avoid adding any siccatives to them.
Earths are suitable for all techniques.
Recommended for the fresco technique.

Caput Mortuum
The name of this red iron oxide literally means "death's head". This pigment has largely replaced mummy brown, as a result of the publicity around the composition of the latter during the 19th century (it was produced by grinding the carboniferous bodies of mummies).
This brown-red colour with a hint of violet can be used in very interesting ways when mixed with a brighter colour.
This pigment can be used with all techniques without any problems.



Reds

Light, purple & orange substitute cadmium reds
Azo pigments, zinc oxide, mineral fillers. As is the case with substitute cadmium yellows, all of the substitute cadmium reds are made up of a number of pigments which help to reproduce the subtlety of genuine cadmium reds. These compositions offer the following properties :
- good lightfastness
- good stability in mixtures with all binding agents. Can be used for oil, gouache, watercolour and acrylic work. Not to be used for fresco work.

Light, purple, orange and solid substitute cadmium reds
Cadmium sulphoselenide. An opaque mineral pigment. Very covering. Remarkable lightfastness and very stable in mixtures with all traditional binding agents. Suitable for all techniques. Do not mix with silver white. Recommended for the fresco technique.

Helios Red
Toluidine red. An organic bright red which is very intense and very luminous. High colouring strength. Medium lightfastness. Can be used for all techniques, including oil, gouache, watercolour, tempera, acrylic etc., but not for fresco work.

Mars Red
Iron oxide. A very dark red brown. Produces a transparent film, with high colouring strength. A very lightfast pigment which is also very stable in mixtures. Suitable for all techniques. Recommended for fresco techniques.

Venetian Red
Iron oxide. A very bright brown with strong colouring. Very lightfast and also very stable in mixtures. Suitable for all techniques. Recommended for fresco techniques.

Quinacridone Red
An organic pigment with very high colouring strength; very lightfast. Produces a luminous, intense bright red. Its transparency allows you to produce wonderful glazes and, when mixed with whites, it produces luminous, delicate pinks.

Substitute French Vermillion Red
The mineral called cinnabar has been in use since ancient times; the Romans called it "Minium". In 1687 Schulte used mercury to produce a pigment which he called "vermillion" derived from the French word "vermeil" (bright red). As a result of this pigment's poor stability, especially with silver white, along with its high toxicity, it has been gradually phased out since the early 20th century and replaced with a substitute based on azo dyes and mineral fillers. A luminous orange bright red offering excellent covering power. Good lightfastness. Suitable for all techniques. Not recommended for fresco work.

Substitute Chinese Vermillion
Toluidine red and mineral fillers; a deep dark red. Medium lightfastness. Suitable for all techniques. Not recommended for fresco work.

Sennelier Pyrrole Orange
This pigment was discovered for the first time in 1974 and has since come into widespread use. It is very popular because its qualities make it a good substitute for certain very expensive pigments such as cadmiums and perylenes.
This bright orange pigment produces bluish gradients and offers considerable covering power.

Yellows

Bright Yellow
This shade is produced by mixing zinc oxide, yellow monoazo dyes and modified acrylamide. A warm yellow, with good lightfastness, which can be used with all binding agents. Not recommended for fresco work.

Substitute Cadmium Yellows
Cadmiums were discovered by Stromeyer in Germany in 1817 and artists soon began using them due to the freshness and liveliness of the hues.
All of the powders which are designated as "substitutes" are made up of a number of organic pigments which help to reproduce the shade of the genuine pigment but at a much lower cost price.
Substitute cadmium yellow is a stable, inert composition of monoazo pigments and mineral fillers and offers good lightfastness. Stable in all binding agents, including oil, watercolour, gouache and acrylic. When used for the fresco technique, only genuine cadmiums are advised.

Genuine Cadmium Yellows
Cadmium sulphide. Opaque mineral pigments of an intense yellow and offering good covering power. Very good lightfastness. Used for all techniques. Do not use these pigments with silver white and chrome yellows.

Lemon Yellow
Formerly zinc yellow whose mediocre properties led to the formulation of this lemon yellow based on an organic (monoazo) pigment. Very good lightfastness. Perfectly compatible with all binding agents and produces very stable mixtures. Good covering power. Not recommended for the fresco technique.

Substitute Indian Yellow
A composition comprising azo pigments. We have reproduced the genuine Indian yellow shade with luminous pigments. Good lightfastness. A transparent pigment. Often used to warm up hues. Can be used for all techniques. Not recommended for fresco work.

Mars Yellow
An azo pigment and natural earth. Although this pigment used to be made from a concentrate of animal urine from the Indies, for more than 50 years now, it has been reproduced using modern pigments. A transparent pigment. Very lightfast. It has high colouring strength. Used for all techniques except fresco work.

Substitute Naples Yellow
Naples yellow is mentioned by Cennino Cennini but it is not clear when it first appeared. Genuine Naples yellow is a lead antimonite, which had been widely over previous centuries, and its properties are now being rediscovered.
However, due to its toxicity, we offer this zinc oxide, titanium dioxide and monoazo yellow based substitute. This composition produces a lightfast luminous yellow. The colour produces a fine dense paste. Used for oil, watercolour, tempera, acrylic, etc. painting. Not recommended for the fresco technique.

Aureoline
The name of this pigment comes from the Latin word "aurum" meaning "gold", and it is a potassium cobaltinitrite which was discovered in the 19th century but only came into widespread use in the 20th century. Its bright reddish yellow colour is very popular, especially for watercolours, due to its brightness and intensity. When used for oils it can be used in much the same way as an Indian yellow. This pigment is very expensive. Suitable for all techniques and also for fresco work.

Greens

Chrome Green Light
Azo and phtalocyanine. Produces a luminous soft green. High covering power. Good lightfastness and stability in mixtures. Not recommended for the fresco technique.

Chrome Green Deep
Azo and phtalocyanine. A bluish dark green. Very powerful colouring strength. Good covering power. Very good lightfastness and stability in mixtures. Not recommended for the fresco technique.

Light Cobalt Green
A combination of zinc and cobalt. A cold pale green, with a very fine tonality, verging on turquoise. Pure, good covering power, low colouring strength. Very lightfast and stable in mixtures. This pigment is suitable for all techniques. Recommended for the fresco technique.

Deep Cobalt Green
Same properties as for light cobalt green. A cold dark green shade with low colouring strength.

Emerald Green Hue
Phtalocyanine and mineral fillers. A composition which is close to the very expensive "genuine emerald green" shade. A luminous green, with high colouring strength. Good lightfastness and stability in mixtures. Not recommended for the fresco technique.

Genuine Emerald Green
Pannetier created this shade in the 19th century and it was quickly adopted due to its remarkable properties, mainly for glazes. "Hydrated" chromium oxide. An intense dark green. Very good lightfastness and stability in mixtures. Not as bright as substitute emerald green and with less colouring strength. Can be used for all techniques and with all binding agents. Avoid using it in very thick layers. Recommended for the fresco technique.

Chromium Oxide Green
Anhydrous chromium oxide. A dull green hue. High covering power and colouring strength. Very good lightfastness and stability in mixtures. Produces a paste which is very pleasant to work with in oils. Recommended for the fresco technique.

Veronese Green
The real thing is a particularly toxic copper arsenate. This bright shade has been reproduced using modern pigments - monoazo, phtalocyanine and mineral fillers. A luminous pale green hue with good covering power and low colouring strength. Good lightfastness. Can be used with all binding agents. Not recommended for the fresco technique.

Phtalocyanine Green
An organic pigment. Offers the same characteristics as phtalocyanine blue, but in a deep cool green tonality. Used for all techniques except fresco work.

Blues

Cerulean Blue Hue
A barium sulphate and phtalocyanine blue based composition. This shade, which imitates genuine cerulean blue, offers remarkable lightfastness. Very high colouring strength. Used for all techniques.

Genuine Cobalt Blue
Cobalt aluminate. In the 19th century the French chemist Thénard managed to produce this pigment from a natural mineral. A blue of a very pure shade. Offers excellent lightfastness. Perfectly stable in mixtures. Is used for all techniques.

Light Ultramarine
Sodium polysulphide aluminosilicate. In 1828 the chemist Guillemet managed to synthesise the natural lapis lazuli which had been used in ancient times. The variations in shades depend upon the sizes of the microparticles. Producing ultramarine is a fairly complex process, which varies according to the shades being sought. A luminous intense blue (the hue is close to cobalt blue). Produces very cool gradients. Stable in mixtures but contains sulphur, so do not mix with silver white and chrome yellow. Suitable for all techniques.

Deep Ultramarine
Sodium polysulphide aluminosilicate. Produced in the same way as light ultramarine. A very intense dark blue, more violet-tinged than the light version of the colour. Very lightfast. One of the basic shades on any artist's palette. Suitable for all techniques.

French Ultramarine
Sodium polysulphide aluminosilicate. French ultramarine is a very intense dark reddish blue and, like dark ultramarine, it has very good lightfastness. Suitable for all techniques.

Prussian Blue
Discovered by Dippel in Prussia in the early 18th century; based on ferric ferrocyanide. A pigment which is difficult both to grind and to wet. Very high colouring strength. Offers fairly good lightfastness (contrary to received wisdom) except with oil colours where it has a tendency to blacken. A cool, transparent hue. Has a drying effect upon greasy binding agents. Not recommended for fresco work.

Indigo Blue
"Indanthrone blue" organic pigment. A synthetic reproduction of plant-based indigo. Very high colouring strength. Remarkable lightfastness. Produces a semi-opaque film and a deep, intense blue. Suitable for use with all binding agents (except for fresco work).

Azure Blue Hue
Formerly "manganese blue", but the hazards involved in the manufacturing process led to its withdrawal. Now based on an organic pigment, phtalocyanine blue and barium sulphate. Very lightfast. Produces a bright, luminous turquoise blue. Can be used for all techniques except fresco work.

Turquoise Cobalt Blue
Cobalt aluminate. This turquoise hue cannot be produced with the same brightness by mixing, which is what makes it unusual. Excellent lightfastness. Use a non-yellowing oil in order to retain all its freshness when painting with oils. Suitable for all techniques.

Phtalocyanine Blue
A pure organic pigment with exceptionally high colouring strength. Very good lightfastness. Due to its colouring strength, it should be used carefully. Its transparency means that it can be used for glazes. Produces a wide selection of blues, ranging from sky blue to darker blues which are reminiscent of Prussian blue. In mixtures, it helps to create a never-ending supply of greens. Used for all techniques (except fresco work).

Light Turquoise
Or cobalt blue. This is a spinel designed by L. J. Thénard in 1804. How dark this pigment is depends on how much surplus alumina it contains. It disperses very well and has very good lightfastness.
It can be used for all techniques.

Violets

Genuine Deep Cobalt Violet
Cobalt phosphate. Dark violet. Very lightfast and also very stable in mixtures. Low colouring strength but good covering power. Suitable for all techniques. Recommended for the fresco technique.

Mineral Violet
Manganese phosphate. Red violet. Good covering power, medium colouring strength, good lightfastness. Can be used with all binding agents. Not recommended either the fresco technique or for any water-based techniques in general.

Ultramarine Violet
Sodium aluminosilicate. A mineral pigment. The colouring strength is not very high. Produces a transparent film of a dull red violet. Very lightfast. Used for all techniques including fresco work.

Permanent Magenta
This is a quinacridone pigment. It was only discovered and industrialised fairly recently. Du Pont de Nemours made a large contribution to the marketing of the compound in the pigment industry. This pigment offers a bluish red hue and can be used for all techniques. Its lightfastness is very good.

Lacquers

"Alizarins"
Synthetic alizarin was discovered by Græbe and Libermann in 1868, using tars. It offers a thorough reproduction of madder, which was traditionally extracted from rubia tinctorium roots. Red alizarin lacquer is a chemical reproduction of natural madder lacquer.
Alizarins of different hues appeared in the 19th century.
Low density pigments.

Scarlet Alizarin Lacquer
A transparent azo lacquer of a very luminous bright red, mainly used for oil, watercolour, tempera and acrylic painting. Medium lightfastness. For oil painting, it is mainly used for glazes because there is a danger of it causing cracks when painting in thick layers. Not to be used fresco work.

Red Alizarin Lacquer
Lacquered alizarin on alumina. A dark red transparent lacquer which produces the carmine hue. Medium lightfastness. High colouring strength. Has a tendency to crack when used for oil painting. Limited siccativity. Used for all techniques except fresco work.

Rose Madder Lacquer
Madder lacquers range from gold rose to purple red. The light makes madder lighten slightly and give off a yellow brown material (xanthine) which livens up the pinkish shade and makes it more radiant. Madder is mainly used for glazes. Suitable for all techniques except fresco work.

Black Lacquer
Synthetic black. Aniline black. Produces an intense, velvety black. Turns into bluish shades. Medium lightfastness. Not to be used for fresco work.

Iridescent pigments

These are titanium dioxide based pigments and they have been surface treated with mica.
The iridescent coloration varies depending upon the mica content which, due to light interference, produces different hues.
Very lightfast, high covering power and hazard-free.
Can be used for a huge range of applications - even for cosmetics.
Can be mixed with binding agents, oils, vinyl, resins, etc.
Avoid grinding them as this would destroy their "pearly" effect. Not suitable for fresco work.

Powdered primary colours

Primary colours are a Sennelier creation in powdered pigments. These colours have been produced with equal mutual colouring strength in order to produce median shades. The mutual colouring strengths have been set so that:
1 yellow volume + 1 red volume = orangy, of an intermediate shade.
1 red volume + 1 blue volume = violet, of an intermediate shade.
1 yellow volume + 1 blue volume = green, of an intermediate shade.
The mutual intensity of these three primary colours has been set so that gradually mixing the shades in two-by-two will be noticeable without adding a graduating white to maintain the purity of the mixed hues. These three shades offer good lightfastness.

Primary Blue
A phtalocyanine pigment and mineral filler. A very lightfast composition. Good colouring strength. Can be used for all techniques, including oil, gouache, watercolour, tempera and acrylic.

Primary Yellow
An azo pigment and mineral filler. A very lightfast composition. Good colouring strength. Can be used for all techniques, including oil, gouache, watercolour, tempera and acrylic.

Primary Red
A quinacridone pigment and mineral filler. A very lightfast composition. Good colouring strength. Can be used for all techniques, including oil, gouache, watercolour, tempera and acrylic.

Metallics : Copper, Yellow Gold, Red Gold

These are metal alloy powders which have undergone surface treatment. They are mixed with greasy binding agents and water. However, they are not suitable for watercolours or fresco work. This varies according to the binding agent. We advise applying a varnish over the top to avoid oxidation.

Fluorescent pigments

Fluorescence is achieved by the basic pigment transforming light, which produces tonalities not found in nature. However, these pigments soon deteriorate and they can only be used for temporary purposes. No lightfastness. Never use for fresco work.

Phosphorescent pigment : yellow-green

An inorganic zinc sulphide based phosphorescent powder. Where possible use water-based binding agents (do not use for fresco work).
Excessive grinding reduces phosphorescence, so it is a better idea to incorporate the pigment into the binding agent by means of either mixing or "light" grinding.
Humidity and ultraviolet light may lead to a photochemical darkening of the pigment. Also, if the product is to be subject to direct light, we recommend using it under humidity conditions of less than 50%.
If it is used properly, this pigment will retain its properties for many years.

T.L. : *Lightfastness*
★★★ : *Very good lightfastness*
★★ : *Good lightfastness*
★ : *Medium lightfastness*
o : *Light-sensitive*

O : *Opaque*
T : *Transparent*
O/T : *Semi-opaque*
n.r. : No details given

Name	N°		Pigments	T.L.	O/T	Chemical compounds	F.	L.G.	G.N.	R
Titanium white	116		PW6	***	O	Titanium Oxide	O	O	O	O
Zinc white	119		PW4	***	T/O	Zinc Oxide	N	O	O	O
Lithopone white	128		PW5	***	T/O	Zinc Sulphide and Barium Sulphate	O	O	O	O
Meudon white	131		PW18	***	T/O	Natural calcium carbonate	O	O	O	O
Bright yellow	511		PY1, PR4	**	T/O	Azoic pigments and mineral fillers	N	O	O	O
Naples yellow hue	567		PY1	**	O	Azoic pigments and mineral filler	N	O	O	O
Primary yellow	574		PY74	**	T/O	Azoic pigment	N	O	O	O
Aureoline	559		PY 40	**	T	Cobalt Yellow	O	O	O	O
Lemon yellow	501		PY3	**	T	Azoic pigment and mineral filler	N	O	O	O
Cadmium yellow light hue	539		PY1, PY3	**	T/O	Azoic pigments and mineral fillers	N	O	O	O
Cadmium yellow medium hue	541		PY1	**	T/O	Azoic pigments and mineral fillers	N	O	O	O
Cadmium yellow deep hue	543		PY1	**	T/O	Azoic pigment and mineral filler	N	O	O	O
Cadmium yellow lemon hue	545		PY1, PY3	**	T/O	Azoic pigments and mineral filler	N	O	O	O
Cadmium yellow light	529		PY35	***	O	Cadmium Sulphide	O	O	O	O
Cadmium yellow medium	531		PY35	***	O	Cadmium Sulphide	O	O	O	O
Indian yellow hue	517		PY1, PY83	**	T	Azoic pigments and mineral filler	N	O	O	O
Cadmium yellow orange hue	547		PY1, PR4	**	T/O	Azoic pigments and mineral fillers	N	O	O	O
Cadmium yellow deep	533		PY35	***	O	Cadmium Sulphide	O	O	O	O
Cadmium yellow orange	537		PO20	***	O	Cadmium Sulphoselenide	O	O	O	O
Mars yellow	505		PY1, PBr7	**	T	Azoic pigments and Natural Earth	N	O	O	O
Cadmium red orange hue	615		PR4, PY1	**	T/O	Azoic pigments and mineral filler	N	O	O	O
Cadmium red orange	609		PO20	***	O	Cadmium Sulphoselenide	O	O	O	O
Sennelier Pyrrole Orange	641		PO73	***	T	Pyrrole Orange	N	O	O	O
Alizarin scarlet Lacquer	694		PR48 :2, PY83	**	T	Azoic pigments and mineral filler	N	O	O	O
Alizarin red Lacquer	696		PR83	**	T	Anthraquinone	N	O	O	O
Cadmium red deep	606		PR108	***	O	Cadmium Sulphoselenide	O	O	O	O
Mars red	631		PR101	***	T/O	Synthetic Iron Oxide	O	O	O	O
Venetian red	623		PR101	***	O	Synthetic Iron Oxide	O	O	O	O
Cadmium red purple	611		PR108	***	O	Cadmium Sulphoselenide	O	O	O	O
Cadmium red light	605		PR108	***	O	Cadmium Sulphoselenide	O	O	O	O
Helios red	619		PR3	**	T	Azoic pigment	N	O	O	O
Cadmium red light hue	613		PR4	**	T/O	Azoic pigment and mineral filler	N	O	O	O
French vermilion hue	675		PR4, PY1	**	O	Azoic pigments and mineral filler	N	O	O	O
Rose Madder Lacquer	690		PR208	***	T	Benzimidazolone Red	N	O	O	O
Primary red	686		PV19	***	T/O	Quinacridone Violet	N	O	O	O
Quinacridone red	679		PR122	***	T	Quinacridone Red	N	O	O	O
Permanent Magenta	680		PR202	***	T	Quinacridone Red	N	O	O	O
Cadmium red purple hue	617		PR3	**	T/O	Azoic pigment and mineral fillers	N	O	O	O
Chinese vermilion hue	677		PR3	**	O	Azoic pigment and mineral fillers	N	O	O	O
Cobalt violet deep genuine	909		PV14	***	O	Cobalt Phosphate	O	O	é.	é.
Mineral violet	915		PV16	***	T	Manganese Phosphate	N	O	é.	é.
Ultra Marine violet	916		PV15	***	T	Sodium Aluminosilicate	O	O	O	O
Indigo	308		PB60	***	T/O	Indanthrene Blue	N	O	O	O
Prussian blue	318		PB27	***	T	Ferric Ferrocyanide	N	O	O	O
Phtalocyanine blue	387		PB15	***	T	Phthalocyanine Blue	N	O	O	O

For each pigment, please refer to this table to find out whether it is suitable for the way in which you would like to use it.

F : *Can be used for fresco work*
L.G. : *Can be used for greasy binding agents, including oils, alkyds, resins, etc.*
G.N. : *Can be used for natural gums (in water)*
R. : *Can be used for acrylic, vinyl-based resins (in water)*

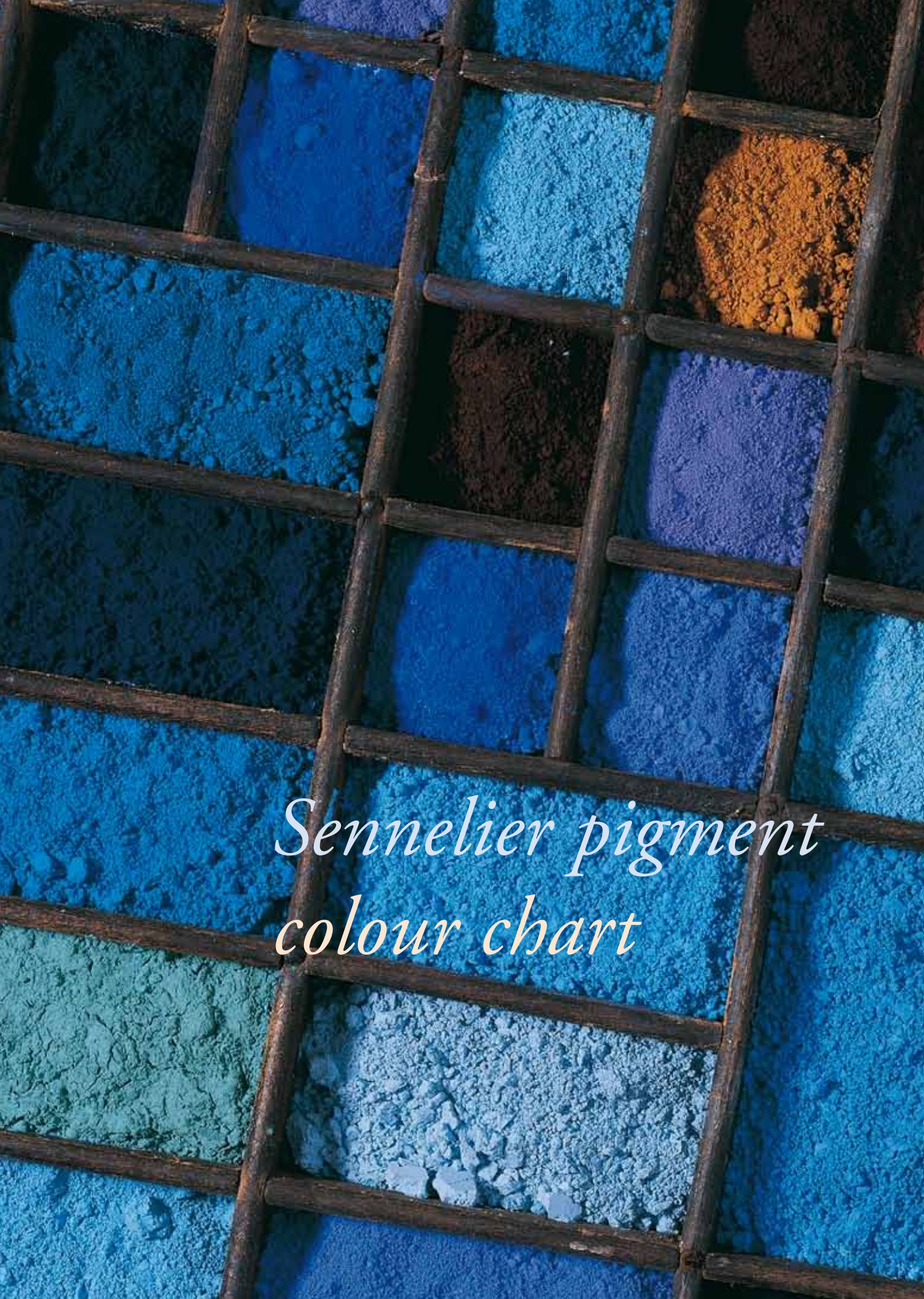
N : *No*
O : *Yes*
é. : *Avoid*
n.a. : *not applicable*

Name	N°		Pigments	T.L.	O/T	Chemical compounds	F.	L.G.	G.N.	R
Ultramarine light	312		PB29	***	T	Sodium Aluminosilicate	O	O	O	O
Ultramarine deep	315		PB29	***	T	Sodium Aluminosilicate	O	O	O	O
French Ultramarine Blue	314		PB 29	***	T	Sodium Aluminosilicate	O	O	O	O
Cobalt blue	307		PB72	***	T	Cobalt Aluminate	O	O	O	O
Cerulean blue hue	323		PB15	***	T/O	Phthalocyanine Blue and mineral filler	N	O	O	O
Primary blue	385		PB15	***	T/O	Phthalocyanine Blue and mineral filler	N	O	O	O
Azure blue hue	320		PB15	***	T/O	Phthalocyanine Blue and mineral filler	N	O	O	O
Turquoise cobalt	341		PB36	***	T/O	Cobalt Stannate	O	O	O	O
Light Turquoise	339		PB28	***	O	Cobalt Aluminate	O	O	O	O
Cobalt green light	833		PB36	***	O	Cobalt and Zinc Oxide	O	O	O	é.
Viridian (genuine)	837		PG18	***	T	Hydrated Chromium Oxide	O	O	O	O
Viridian hue	869		PG7	***	T/O	Phthalocyanine Green and mineral filler	N	O	O	O
Phtalocyanine green	896		PG7	***	T	Phthalocyanine Green	N	O	O	O
Cobalt green deep	835		PG26	***	O	Cobalt and Zinc Oxide	O	O	O	é.
Chrome green deep	807		PG36	***	T/O	Phthalocyanine Green and mineral filler	N	O	O	O
Emerald green hue	847		PG36, PY3	***	T	Phthalocyanine Green, Monoazoic Yellow, mineral filler	N	O	O	O
Chrome green light	805		PY74, PG7	***	T/O	Azoic Pigment and Phthalocyanine Gree	N	O	O	O
Chromium oxide green	815		PG17	***	O	Chromium Oxide	O	O	O	O
Green earth	213		PG23	***	T	Natural Earth	O	O	O	O
Caput Mortuum	919		PR101	***	O	Synthetic Iron Oxide	O	O	O	O
Van Dyck brown	407		PBr8	**	O	Manganese Brown	O	O	O	é
Red brown	405		PR101, PBr7	***	O	Iron Oxides	O	O	O	O
Madder brown	471		PBr23, PY42	***	T/O	Azoic pigment, Iron oxide and mineral filler	N	O	O	O
Raw Sienna	208		PBr7	***	T	Natural Earth	O	O	O	O
Burnt Sienna	211		PBr7	***	T	Natural Earth	O	O	O	O
Raw umber	205		PBr7	***	T/O	Natural Earth	O	O	O	O
Burnt umber	202		PBr7	***	T/O	Natural Earth	O	O	O	O
Red ochre	259		PR102	***	O	Natural Earth	O	O	O	O
Gold Ochre	257		PY119	***	O	Zinc Ferrite	O	O	O	O
Light Yellow Ochre	254		PBr24	***	O	Chromium Antimony Titanium Buff Rutile	O	O	O	O
Yellow ochre	252		PY43	***	T	Natural Earth	O	O	O	O
Brown ochre	255		PBr7, PG7	***	T/O	Natural Earth, Phthalocyanine Green	N	O	O	O
Mars black	759		PBk11	***	O	Synthetic Iron Oxide	O	O	O	O
Black Lacquer	763		PBk1	**	T	Aniline Black	N	O	O	é.
Ivory black	755		PBk9	***	O	Bone Black	N	O	O	O
Black for fresco	761		PBk6/7	***	T/O	Carbon Black	O	O	O	O
Fluo yellow	502		n.r.	o	T	Fluorescent Pigment	N	O	O	O
Fluo orange	648		n.r.	o	T	Fluorescent Pigment	N	O	O	O
Fluo red	604		n.r.	o	T	Fluorescent Pigment	N	O	O	O
Fluo pink	654		n.r.	o	T	Fluorescent Pigment	N	O	O	O
Copper	36		n.r.	***	O	Metallic alloy powder	N	O	é.	O
Red gold	40		n.r.	***	O	Metallic alloy powder	N	O	é.	O
Yellow gold	30		n.r.	***	O	Metallic alloy powder	N	O	é.	O
Iridescent	20		n.r.	***	T/O	Micaceous Titanium	N	O	O	O
Phospho yellow green	10		n.r.	n.r.	n.r.	Phosphorescent pigment	N	O	O	O

Azure Blue. Burnt Ochre.
De caeruleo et usta.

After discovering the making of (azure) blue in Alexandria, Vestorius set up its making at Puzzuoli. Keeping in mind its odd components, the invention is quite remarkable. After grinding sand and the flowers of natron both together as finely as meal, the powder is mixed with copper that is grated with coarse files over the mixture, like sawdust, to form a conglomerate. Then it is made into balls by rolling it in the hands and then bound together for drying. The dry balls are put in a clay jar, and the jars in an oven. As soon as the intensity of the fire melts the copper and sand, they mutually liquefy, losing their own properties and becoming one as the azure blue colour.
Burnt ochre, which is very widely used for stucco work, is also treated with fire, then extinguished in vinegar, which gives it its purple colour .

Vitruvius. The Ten Books of Architecture. Chapter XI



Sennelier pigment colour chart

Pigment colour chart

*116 *** ■*
Titanium white
PW6

*119 *** ◪*
Zinc white
PW4

*128 *** ◪*
Lithopone white
PW5

*131 *** ◪*
Meudon white
PW18

*511 ** ◪*
Bright yellow
PY1 PR4

*567 ** ■*
Naples yellow hue
PY1

*545 ** ◪*
Cad. yellow lemon hue
PY1 PY3

*529 *** ■*
Cadmium yellow light
PY35

*531 *** ■*
Cad. yellow medium
PY35

*517 ** □*
Indian yellow hue
PY1 PY83

*547 ** ◪*
Cad. yellow orange hue
PY1 PR4

*533 *** ■*
Cadmium yellow deep
PY35

*696 ** □*
Alizarin red Lacquer
PR83

*606 *** ■*
Cadmium red deep
PR108

*631 *** ◪*
Mars red
PR101

*623 *** ■*
Venetian red
PR101

*611 *** ■*
Cadmium red purple
PR108

*605 *** ■*
Cadmium red light
PR108

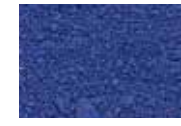
*680 *** □*
Permanent Magenta
PR202

*617 ** ◪*
Cad. red purple hue
PR3

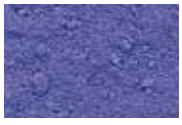
*677 ** ■*
Chinese vermilion hue
PR3

*909 *** ■*
Cobalt violet deep genuine
PV14

*915 *** □*
Mineral violet
PV16



*916 *** □*
Ultra Marine violet
PV15



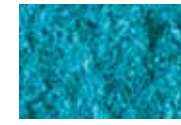
*307 *** □*
Cobalt blue
PB72

*323 *** ◪*
Cerulean blue hue
PB15

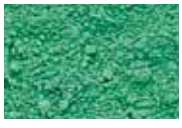
*385 *** ◪*
Primary blue
PB15

*320 *** ◪*
Azure blue hue
PB15

*341 *** ◪*
Turquoise cobalt
PB36



*339 *** ■*
Light Turquoise
PB28



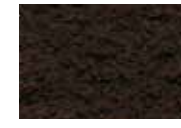
*847 *** □*
Emerald green hue
PG36 PY3

*805 *** ◪*
Chrome green light
PY74 PG7

*815 *** ■*
Chromium oxide green
PG17

*213 *** □*
Green earth
PG23

*919 *** ■*
Caput Mortuum
PR101



*407 ** ■*
Van Dyck brown
PBr8

*259 *** ■*
Red ochre
PR102

*257 *** ■*
Gold Ochre
PY119

*254 *** ■*
Light Yellow Ochre
PBr24

*252 *** □*
Yellow ochre
PY43

*255 *** ◪*
Brown ochre
PBr7 PG7

*759 *** ■*
Mars black
PBk11

502 o □
Fluo yellow
n.r.

648 o □
Fluo orange
n.r.

604 o □
Fluo red
n.r.

654 o □
Fluo pink
n.r.

*36 *** ■*
Copper
n.r.

*40 *** ■*
Red gold
n.r.

574 ** ◪
Primary yellow
PY74

559 ** □
Aureoline
PY40

501 ** □
Lemon yellow
PY3

539 ** ◪
Cad. yellow light hue
PY1 PY3

541 ** ◪
Cad. yellow medium hue
PY1

543 ** ◪
Cad. yellow deep hue
PY1

537 *** ■
Mars yellow
PO20

505 ** □
Mars yellow
PY1 PBr7

615 ** ◪
Cadmium red orange hue
PR4 PY1

609 *** ■
Cadmium red orange
PO20

641 *** □
Sennelier Pyrrole Orange
PO73

694 ** □
Alizarin scarlet Lacquer
PR48:2 PY83

619 ** □
Helios red
PR3

613 ** ◪
Cadmium red light hue
PR4

675 ** ■
French vermilion hue
PR4 PY1

690 *** □
Rose Madder Lacquer
PR208

686 *** ◪
Primary red
PV19

679 *** □
Quinacridone red
PR122

308 *** ◪
Indigo
PB60

318 *** □
Prussian blue
PB27

387 *** □
Phtalocyanine blue
PB15

312 *** □
Ultramarine light
PB29

315 *** □
Ultramarine deep
PB29

314 *** □
French Ultramarine Blue
PB29

833 *** ■
Cobalt green light
PB36

837 *** □
Viridian (genuine)
PG18

869 *** ◪
Viridian hue
PG7

896 *** □
Phtalocyanine green
PG7

835 *** ■
Cobalt green deep
PG26

807 *** ◪
Chrome green deep
PG36

405 *** ■
Red brown
PR101 PBr7

471 *** ◪
Madder brown
PBr23 PY42

208 *** □
Raw Sienna
PBr7

211 *** □
Burnt Sienna
PBr7

205 *** ◪
Raw umber
PBr7

202 *** ◪
Burnt umber
PBr7

763 ** □
Black Lacquer
PBk1

755 *** ■
Ivory black
PBk9

761 *** ◪
Black for fresco
PBk6/7

30 *** ■
Yellow gold
n.r.

20 *** ◪
Iridescent
n.r.

10 n.r.
Phospho yellow green
n.r.

The colours shown on the colour chart are as close as possible to the actual colours, although they are limited by printing techniques, so this colour chart should be used for information only.

*** : *Very good lightfastness*
** : *Good lightfastness*
* : *Medium lightfastness*
o : *Light-sensitive*

■ : *Opaque*
□ : *Transparent*
◪ : *Semi-opaque*
n.r. : *No details given*

SENNELIER


Pigment Pur
Dry Pigment
Bleu Outremer foncé
Ultramarine deep
315
SENNELIER
Pigment Pur
Dry Pigment
619
SENNELIER

What is a colour?

Pigment

To give the colour its full intensity.
The final colour will depend on the quality of the chosen pigment but also on it being properly ground.
The more finely ground a pigment is, the more it will reveal the full intensity of its colour.

+ 1 binding agent

(glue or gum), together with the pigment this is the key component of any paint.
It will bind together all the components of the paint and give it its consistency.

+ 1 thinner

(or solvent), a component which helps to define the paint's viscosity.
The thinner evaporates during drying in order to fix the colour onto the medium.

+ additives

which, depending on what the artist wants to do, they help to provide the sheen, to matify, to speed up or slow down the drying process, to liquefy, to solidify, etc.

For instance, a Sennelier watercolour is made up of a pigment, gum arabic (the binding agent) and honey (the additive), which will make it bright and smooth and it is then diluted in water (the thinner).

Guidelines

The following dosages are given for information only but they may vary depending on the nature of the pigment. Some - such as titanium white for instance - need more binding medium to be added.
We advise using a glass muller and a ground glass or marble plate for grinding colours as this will help to bring out the full intensity of the pigment.
To avoid mistakes, start by pouring out the desired quantity of glue or gum and then gradually add the pigment, grinding it properly until you get the desired texture.
The paste produced should be easy to handle.
Each family of colours has its own specific features.

Water-based colours

Watercolour, gouache and tempera paints all require the addition of a hydroscopic product such as glycerine in order to slow down the drying process and give a smoother finish, plus an anti-fermenting component also needs to be added to the preparation as this is necessary for the conservation of the animal or plant-based adhesive, in order to make it imperishable.

Oil colours

You should preferably use clarified linseed oil or safflower oil for all shades except the whites and very pale colours for which we recommend that you use poppy seed oil.
You must take care not to add too much oil because the longer the manual grinding takes, the more fluid the mixture will become.

Acrylic colours

Acrylic paints are made up of pigments and an emulsion made of water and acrylic polymers.
Acrylic paint can be mixed in water and used on many media. It also dries quickly and is indelible.

Dosage for 100 g of pigments

Oil colours:
30 to 100 g of oil (linseed, safflower or poppy seed)
2 to 3 g of Courtrai drier (except 5 to 8 g of for ivory black)
N.B. to give the paste more body you can add 1 to 3 g of purified beeswax

Watercolours:
50 to 100 g of gum arabic in a 35% solution
10 to 15 g of glycerine
1 g of anti-fermenting preservative

Gouache colours:
50 to 100 g of gum arabic in a 35% solution or yellow dextrin
8 to 10 g of glycerine
1 g of anti-fermenting preservative

Egg tempera colours:
50 to 100 g of gum arabic in a 35% solution
5 to 10 g of glycerine
1 g of dried egg yolk
1 g of anti-fermenting preservative
N.B. there are countless doses of tempera

Acrylic colours:
75 to 200 g of acrylic binding agent
1 g of anti-fermenting preservative
5 to 20 g of water, if necessary to adjust the consistency

Dosage pour 100g de pigments

Vinyl colours:
80 to 100 g of Caparol binding agent
5 to 15 g of water, if required in order to adjust the consistency
1 g of anti-fermenting preservative

Oil pastel:
60 to 80 g of beeswax or mineral wax
25 to 50 g of oil, Vaseline or non-siccative petroleum oil

Soft pastel:
80 to 90 g of pure pigment
2 to 6 g of gum tragacanth, glucose, gum arabic or dextrine + water
1 g of anti-fermenting preservative
This solution needs to be concentrated by roughly 1 to 3%

As the chemical nature of the products varies considerably from one pigment to another, the dosages shown above will need to be adapted. These dosages are given for information only and we cannot be held liable for the results.

Binding mediums

In order to make it easier to use the pigments, Sennelier offer a range of ready-to-use grinding binding agents.
These are as follows:
- Binding medium for oils
- Binding medium for watercolours
- Binding medium for tempera
- Binding medium for gouache
- Binding medium for acrylics
- Caparol binding medium (vinyl)
- Methyl cellulose binding agent

READY-TO-USE BINDING MEDIUMS
Easy, quick and with little risk of getting it wrong.

Oil binding medium

Made from thick, non-yellowing, vegetable oil especially designed for the grinding of oil colours to the optimum consistency. This binding medium has a good affinity for the pigments traditionally used in this family of paints. It includes a lead-free complete drying agent, allowing drying both on the surface and deep below it.

HOW TO USE:
Mix in the following variable proportions:
1. The pigment.
2. The nature of the grinding.
This binding medium needs to be added gradually during the grinding process, until you get the desired consistency. The fact that it is thick will make the operation easier and will allow even inexperienced painters to produce a paste whose consistency is pleasant to work with.

• 200 ml bottle > N130120.
• 1000 ml bottle > N130121.

Watercolour binding medium

A preparation made from gum arabic, honey, water and preservative.
When ground with the pigments it produces a paste with the consistency of honey which can be diluted in water.

HOW TO USE:
1 - Mix the binding medium with the pigment taking care to crush the pigments properly.
2 – If the mixture is too thick, it is a good idea to add watercolour binding medium in order to retain the transparency and sheen of the final product. To make the binding medium flow more smoothly you can also add a maximum of 5 to 10% water.

• 200 ml bottle > N131507.

Gouache binding medium

A preparation made from natural gum, glycerine, water and preservative.
Together with the pigments, it produces a gelled, matt and opaque appearance. The film produced can be reworked with water .
This binding medium is mixed in any proportion with the pigments traditionally used to manufacture gouaches.

HOW TO USE:
1-Mix the ready-to-use binding medium with the pigment
2-If the paste is too thick, add water - although not too much – in order to preserve the matt look and opacity of the colour.
Thinner: water. Fix to the gouache varnish for indelibility.

• 200 ml bottle > N130508.

Tempera binding medium

A preparation made from egg, gum arabic and vegetable oil. When ground together with the pigments it gives the mixture a smooth consistency. The film produced will have a satin-like sheen and cannot be reworked with water . It allows superimpositions.

HOW TO USE:
1-Mix the ready-to-use binding agent with the pigment
2-If the paste is too thick, add water – although not too much. Thinner: water.

• 200 ml bottle > N131020.

Acrylic binding medium

Pure acrylic resin (acrylic polymer) with 46% dry extract. A glossy, transparent product, with better water-fastness than the Caparol based preparation.
The acrylic binding medium is water-soluble and irreversible once dry.

HOW TO USE:
1.How to use quickly: water the binding medium down by 10 to 25% and then mix vigorously together with the pigments until you get an even paste. The more water there is in the preparation, the more matt the product will become, while at the same time it will become less indelible.
2.The traditional preparation method using emulsion.
This consists of turning the powdered pigments into a paste in 20 to 80% of the methyl cellulose binding medium solution.

Then, to bind it together with the pigment, add the acrylic binding medium until you get a fairly thick paste. The less methyl cellulose binding agent is mixed in with the pigment, the better the water-fastness of the acrylic paint will be once it is dry. You can add more glycerine to slow down the drying process.

Produces a satin-like glossy film depending upon the percentage of acrylic resin which is used.
- *200 ml pot > N133646.*
- *900 ml pot > N133647.*

OTHER BINDING MEDIUMS

Methyl cellulose binding medium

This binding agent comes in powder form and is used with water. It is used with the pigments either:
1. As a resin to produce traditional gouaches.
2. As an agent to turn pigments into paste, to provide body before preparing vinyl, acrylic or tempera colours.

HOW TO USE:
Reminder: before preparing these three types of paint, we recommend mixing the pigments into a paste on the following basis:
- 125 g of methyl cellulose binding medium
- 3 litres of water
- 20 g of preservative
Stir the solution well or grind it before using it as a basis for mixing the pigments. Once the pigments are properly bound, add the desired binding medium (Caparol, acrylic, an egg-based binder).

Reversible glue. Dissolves in cold water and hardens in hot water.
- *250 ml pot > N133657.*

Caparol vinyl binding medium

"Caparol vinyl" is a binding medium with a high polyvinyl acetate content and it can be diluted in water.
One unusual feature of this vinyl binding medium is that it has been specially designed to be mixed with powdered pigments. It is simple to use.
"Caparol vinyl" produces an indelible film, with a satin-like matt and uniform appearance, exactly the same as gouache. So colours which use "Caparol vinyl" as a binding medium can be superimposed upon one another.
All pigments are suitable, with the exception of Prussian blue, silver white, chrome yellow, barium yellow, zinc white, (risk of causing efflorescence and thickening).

A paint made with the "Caparol vinyl" binding medium can be applied to any degreased medium such as wood, agglomerate, primed or semi-absorbent canvas, plywood, card, cement, plaster, etc.

1) QUICK METHOD FOR IMMEDIATE USE:
Water the "Caparol vinyl" binding medium down by 10 to 25%.
Mix the watered-down Caparol together with the chosen pigments vigorously until you get a smooth paste.
Please note that if you increase the proportion of water added to the "Caparol vinyl", the result will become more matt but less indelible.
2)TRADITIONAL METHOD FOR PREPARING A PRODUCT WITH EMULSION:
This consists of mixing the powdered pigments into a paste in 20 to 80% of the methyl cellulose binding medium solution.
Then, to bind it with the pigment, add the Caparol until you get a fairly thick paste.
N.B. Initially we advise you to aim for a thick consistency with the methyl cellulose binding medium. This will help you to add enough Caparol to provide a uniform, indelible film.

- *1 litre pot > N262671.*
- *5 litre bucket > N262672.*

Application products

A colour for every artist. There are many products which can be used so that anyone can achieve the desired result.
These products include:
- Oils: used specifically for oil painting; their properties vary from one kind to another.
- Glues: these help to isolate the fibre so that the paint cannot pass through it (it blocks the pores of the canvas), but also to create a phase during which the paint can adhere. They can also act as binding agents for the production of certain kinds of paint.
- Gums: these are natural resins which are used in paint both as binding agents and as adhesives. They are used due to the special properties they give the film (solidity, gloss, etc.)
- Waxes: these will change the way the paint looks, by making it either glossy or matt.

OILS

Linseed oil

An oil extracted from linseed by means of pressure.
This transparent oil, with its characteristic smell, is highly siccative when it comes into contact with air.
However, its sensitivity to the oxygen in the air and its high linolenic acid content lead to a marked yellowing, which suggests it should not be used with certain pigments, especially blues and whites.
This oil produces an easy-to-use paste which gives the finish real staying power.

Safflower oil

Made from the seed of the safflower, which is an oilseed grown in North America, amongst other places.
Although its siccativity is close to that of linseed, it does not yellow as much.
It gives the finish real staying power and this justifies its sole use for most pigments.

Poppy seed oil

This oil comes from the seed of the poppy.
It is less siccative than linseed oil, but it yellows noticeably less over time.
This makes it useful for grinding blues and whites, amongst others, even though the paste has less texture than that produced with linseed oil.

GLUES

GLUES have been in use for hundreds of years due to their incomparable qualities. They can be differentiated by their properties and by the techniques with which they are compatible.

Rabbit skin glue

Glue made from animal skins has been in use for centuries, especially for tempera techniques. It is made from rabbits' skins from which the collagen is extracted in the form of gelatine. It is considered to be the best of the animal-based glues and is still used due to its high adhesive strength and flexibility.

It is perfect for gluing and coating canvas, paper, card and wood and it is also used as a binding agent for colours, paints and gilding work on wood or for pictorial colours.
Appearance: golden brown sheets or granules.

HOW TO USE:
- Dissolve 100 g of rabbit skin glue in 1 litre of cold water for 12 hours.

- Bring the dissolved mixture to a temperature of above 37° - although without boiling it, as this would make your glue lose all its properties and make it unusable.

Pros: flexibility (allows canvases to be glued and then rolled without the film breaking), strong adhesive strength, good resistance to oil.

Fish glue

A glue extracted from the bladders and cartilages of fish, 50% dry extract.
This glue has been used since ancient times and up until the mid-20th century it was the universal glue for all small-scale work, including cabinet making , marquetry and gilding. It is used in many old formulae and as a glue for paper, card, wood and natural fabrics. It allows you to do tempera work and produce glues for fabrics, and is used in restoration techniques at a concentration of from 30 to 50%.
Appearance: Viscous and a brownish colour.

HOW TO USE:
Used directly, diluted in between 5 and 20% water.

Sennelier fish glue contains a preservative.
Pros: A reversible glue with a good adhesive strength; it dries slowly and is used cold.

Bone glue

Bone glue has been known since ancient times and is to be found in many old recipes. For a long time it was used in cabinetmaking, woodwork and binding. It is extracted from the bones of cows or sheep.
It is used for gluing and coating purposes, but also as a binding agent. Bone glue is very popular for work on wood.
Appearance: It comes in solid form and looks rather like a wax.

HOW TO USE:
- Leave to soak for 3 to 4 hours before dissolving it hot.
- It is used hot and needs to be kept in a water bath in order to keep it liquid.
Generally used in a high concentration of from 30 to 50%, depending on the type of use.

GUMS

GUMS are natural resins which can be used as either binding mediums or glues. Some, such as gum arabic, are diluted in water and others, such as mastic or dammar gum, are diluted with turpentine oil. Gums can be used as glues but above all they are very popular due to their film-forming, gloss, reversibility or irreversibility properties, etc...

Gum arabic

A plant-based product which is exuded from an acacia (African) and is probably the most famous of all gums. It has many uses; indeed gum arabic is found in a wide variety of fields ranging from food to beauty products. This water-soluble gum is used to produce watercolours and gouaches and also as a glue. Kordofan quality – this is the purest known gum arabic and it comes from the region of the same name - is particularly used to produce watercolours and gouaches.
Appearance: It comes in irregular pieces of a very pale yellow colour.

HOW TO USE:
It is diluted slowly in water, with regularly stirring.
- 20 to 50% maximum,
- 5 to 10% glycerine,
- 0.5% preservative

It produces a film which is glossy but brittle, which is glycerine should be added.
Pros: water-soluble. When used as a binding agent, it gives the colours transparency, gloss and luminosity. Non-toxic. Produces a reversible film.

Mastic gum “in tears”

“Chios” mastic in tears is produced by a tree from the terebinthinaceum family which is commonly found on the Greek island of Chios. This resin is used not only in the fine arts but also for dental hygiene, cosmetics and food. This resin is soluble in turpentine oil and has been in use for a long time, especially for oil painting, or for varnishes and mediums for oil paints.
Appearance: it comes in small light yellow droplets.

HOW TO USE:
It is soluble not in water but in turpentine oil. Mastic gum dissolves slowly, needing to be stirred for a long time, and it is then filtered once or twice to get rid of all the impurities.

It produces a film which is very glossy but slightly brittle but, to make up for this drawback, we can add Venice turpentine, stand oil or glycerine.
To produce a varnish for paintings:
- 30 to 40% mastic resin
- 60 to 70% turpentine oil
- a maximum of 3 to 5% Venice turpentine
A perfectly reversible varnish, gives the varnished work a "soft” gloss. Pros: Very high gloss, reversibility.

Dammar gum

A fossil resin found in the Philippines Islands in Asia. This resin has been in common use since the 18th century to produce varnishes and mediums. Dammar gum is dissolved by being stirred slowly into turpentine or petroleum oil type solvents.

Its properties make it very useful as a temporary varnish or intermediate layer (e.g. as a retouching varnish) and it can also be used as a primer for retouching or adding a final varnish.

Appearance: it comes in irregular, very pale yellow pieces the size of a walnut.

HOW TO USE:

The concentration of this gum varies from 15 to 30% depending on the kind of solution prepared, the medium or the varnish.

We recommend adding a plasticiser such as Venice turpentine, Canada balsam or stand oil, although you must not use more than 5% at the very most.

As there is a slight percentage of insoluble wax in this gum, the solution produced is slightly cloudy and, to get rid of this cloudiness, leave the solution to rest for a few days and then strain once or twice through a cloth or filter paper.

Pros: produces a smooth glossy film which fills in any roughness on the medium and smoothes the surface, and is reversible. There is only a very slight adverse effect upon the final result.

Discoloured gum lacquer

A natural gum of animal origin produced by insects from the Indies or Asia, from which all waxy matter has been removed. It was introduced into Europe in the 17th century.

This gum is used to produce varnishes, fixatives, inks and French polish.

Appearance: it comes in the form of gold brown flakes.

HOW TO USE:

How to use: This gum is compatible with water but requires alcohol in order to be dissolved. It can be dissolved either:

- in borax: 3 to 4% in hot water.

- or, more commonly, in ethyl alcohol.

Recipes:

1) Spirit varnish:

• 5 to 15% gum lacquer,

• 85 to 95% alcohol.

2) Fixative:

• 1 to 5% depending on the kind of fixative,

• 95 to 99% alcohol.

3) French polish:

• 17 to 20% gum,

• 73 to 80% alcohol.

Gum lacquer based varnishes must under no circumstances be used with the oil painting technique.

Pros: a very glossy film, of a transparent amber colour and indelible.

WAXES

WAXES are used to alter the texture and look of the film. They need to be filtered in order to remove any impurities.

Beeswax

A wax of animal origin, virgin quality or white. This pure wax appears in numerous recipes and is used as an additive to give the film flexibility, to improve its final appearance and its strength but also as a matting agent for varnishes (a few %). Used to produce so-called "beeswax" paints.

Appearance: it comes in pellet form.

HOW TO USE:

Beeswax is easy to incorporate hot and melts at approximately 63°. Soluble when cold in turpentine oil or white spirit. Be careful, because wax is sensitive to heat.

Pros: it is a very stable binding agent over time, provided that the artworks are stored properly. Gives the film flexibility and strength.

Carnauba wax

A vegetable wax which has been in common use since the 18th century. It is used in many areas, not just for paint.

It has a melting point of 83°, which is higher than that of beeswax.

Carnauba wax produces a hard, compact film. Its properties make it a very way of protecting works. Due to its transparency, it is also used to varnish beeswax paints or paintings themselves.

Appearance: it comes in the form of yellow flakes.

HOW TO USE:

Dissolves hot in a water bath, using turpentine or petroleum oil.

It is used in a mixture with beeswax to raise the melting point and make the film harder.

Pros: very transparent. Produces a film which is not particularly sensitive to humidity.

Egg yolk

Its use in artistic painting dates back to very ancient times. Egg-based paint was the forerunner of oil paint and most primitive paintings were done using egg tempera painting techniques. It can be used as either a binding agent or a medium.

Egg yolk allows easier emulsification, thus producing a paint which can be diluted in water. Indeed, it is itself already an emulsion containing 50% water and 30% fat.

Appearance: freeze-dried powdered egg yolk (the water is removed when cold) which retains all of its properties.

HOW TO USE:

- 1 to 4% in (demineralised) water,

- Add 1 to 3% preservative in order to store the paint produced; otherwise the paste cannot be kept.

Pros: egg yolk solidifies the film and adds fat.

Bitumen

This is an oil shale resin fossil which was used in oil painting - especially for the backgrounds of portraits - back in the 19th century, although it is not very commonly used nowadays. The resin is used to produce varnishes for engraving, due to its properties such as adherence and smoothness. This heat-sensitive resin is reversible. It produces a transparent brown which is very popular for glazes.

Appearance: it comes in the form of a black powder.

HOW TO USE:

It dissolves in white spirit or turpentine oil. Dose to produce an engraving varnish: 15 to 25% resin dissolved in turpentine or petroleum oil in a water bath.

Please note that bitumen blackens over time.

This colour should not be used in oil painting where it has a tendency to run and crack.

Pros: colour

Pure graphite

Powdered natural graphite from Sri Lanka is a form of coal.

It is commonly used to produce lead pencils and has a huge range of applications in industrial paints, including rust-proof paints and products which need to be able to stand up to heat. It is also a good conductor of electricity.

Appearance: fine flakes of shades which vary from deep black to grey.

HOW TO USE:

Due to its low density, graphite has a high oil absorption rate.

It is also used in powdered form to make water-based imprimaturas and washes.

Pros: rust-proof properties

Gelatine

This is a glue of animal origin (collagen) which has been in use for centuries. This fine quality is used not only for delicate work such as restoration, illumination, etc. but also to prepare paper.

Appearance: it comes in sheet form.

HOW TO USE:

Leave the sheets to soak in cold water for 2 to 3 hours, then dissolve in a water bath, stirring gently as you do so.

- 5 to 15% depending on the recipe,

- 0.1 to 0.3% preservative.

Once it has been dissolved, gelatine does not keep well as it is sensitive to both humidity and heat, so we advise you to prepare it only as and when required.

Pros: perfect for delicate work. A transparent protective film.

Casein

This is a substance (a mixture of proteins) contained in milk. By its nature, casein is insoluble in water, although it can be dissolved with ammoniac, borax or a solution of soda.

Appearance: it comes in the form of a powder which must be stored away from any humidity in a tightly-sealed container.

HOW TO USE:

Casein is used as a binding medium in paint at between 10 and 20%, depending upon how it is used.

It is also used as a glue mixed with milk of lime (approximately 5%).

It stabilises latex-based emulsion paints and makes them insoluble, but it can also be used in a mixed binding agent.

Once mixed with the pigments, it gives the paints a very luminous, indelible matt finish, but it should only be applied in thin layers because it has a tendency to crack if it is too thick.

Sample 10% solution:

- *Casein 10 g,*
- *Water 88 g,*
- *Ammoniac 2 g,*

• *Preservative 0.5 g.*

A preservative must added to the casein once it is in solution in order to prevent any mould from growing. It needs to be prepared in a plastic recipient in order to avoid any contact with metal. The operations are exactly the same for the borax-based preparation, but the process is carried out hot.

Sennelier casein is already treated, which means that it is immediately water-soluble.

Pros: casein gives paints exceptional luminosity. It produces an indelible film.

Venice turpentine

Venice turpentine balsam is a natural resin extracted from larch and was used in ancient times. It is used to make colours, painting mediums and varnishes.

Appearance: its consistency may vary according to the climatic conditions (from pure honey to a syrupy consistency).

HOW TO USE:

It has a viscous consistency and cannot be applied on its own. It needs to be diluted in turpentine oil. This natural product should not be used in formulations at more than 5%.

Pros: it gives a luminous gloss, transparency and a smooth finish as long as only a fairly small percentage is used.

Siccatives

Metal compounds which promote the "drying" – or, to be more precise, the "siccativation" - of oils, which makes them go hard. There are various kinds, promoting:

- *Surface drying: cobalt or zirconium siccative*
- *In-depth drying: zinc or manganese siccative, for instance.*

HOW TO USE:

The Sennelier Cobalt siccative includes various elements to promote both surface and in-depth drying. Should be used in small quantities of up to 0.5%.

The Sennelier Courtrai drier improves in-depth drying; 0.5 to 3%.

White siccative: boosts the natural siccativity of the components of the paste. It can be used in high proportions (5 to 15%).

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