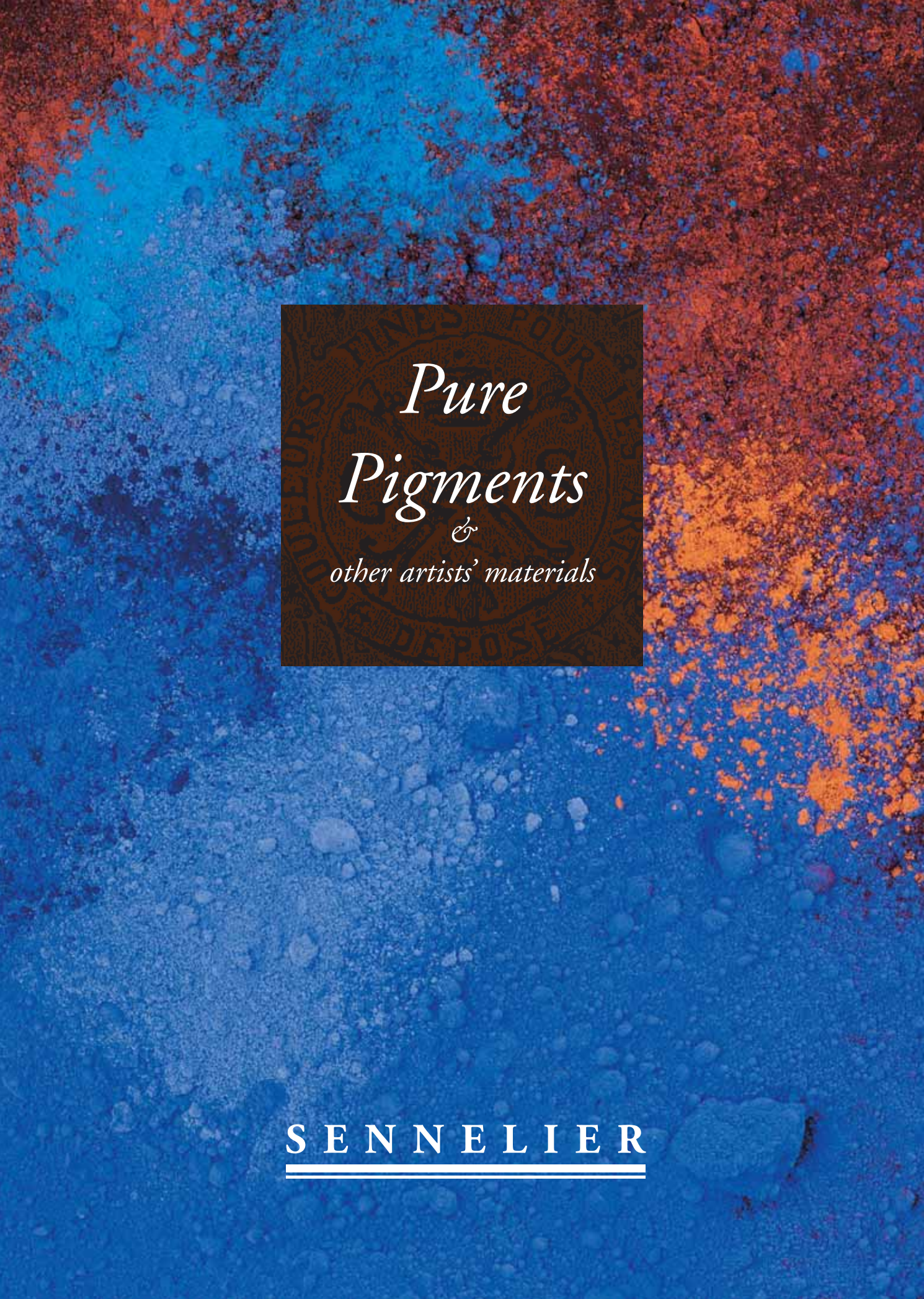

Pure
Pigments
&
other artists' materials
SENNELIER

At the end of the 19th century, when he developed oil colours for his artist customers who would include immortal names like Cézanne, Gauguin and Picasso, Gustave Sennelier recognized the need for producing paints that only contained the highest quality pigments. In order to craft superior colours, Gustave verified that the origins of the pigments were from selected traditional sources, while precisely identifying their specific chemical characteristics. Ultimately, his great respect for these materials not only insured the permanence of works created with his paints, but also assured the production of an increasing array of unique colours of unsurpassed beauty and quality.

Since then, some pigments have disappeared, their natural resources depleted and others have been restricted due to their toxicity. But with recent innovations and research Sennelier offers a wide variety of synthetic pigments that perfectly match the performance of such ancient mineral pigments such as Lapis Lazuli and Cinnabar. Yet at the same time Sennelier still mines the earth for minerals and other natural elements from traditional sources - pigments like clays and iron oxides used in ochres and the preparation of "burnt" earth colours from calcified soil.

At the dawn of the 21st century, Sennelier still keeps a watchful eye on the pigments selected for its lines of extra-fine oils, oil sticks, watercolours, soft pastels and oil pastels. These very same pigments are available to artists wishing to master the preparation of their own colours.

This brochure supplies artists with the basic information necessary for grinding dry pigments in the appropriate binders, an important step in creating beautiful and lasting works of art.

Whites

Flake White
Basic lead carbonate, or lead white.
This white is well known since antiquity - the Romans called it "ceruse". Sennelier still prepares it following the same ancient methods. Opaque and dense, it creates a highly durable film, and is best used in an oil binder. Avoid mixtures with cadmiums and ultramarine blues. Suitable for fresco, but prepare it with caution, due to its toxic nature. Not recommended for water-based techniques.

Lithopone White
Zinc sulfide and barium sulfate. Dense opaque white invented in 1860 by the French chemist de Romanange. Creates tints with exceptional luminosity. Frequently used in grounds.

Blanc de Meudon or Marly White
Natural chalk carbonate. Delicate white with good covering capabilities, generally used in water-based paints. Often used in conjuction with Lithopone white.

Titanium White
Titanium dioxide (rutile variety). Very lightfast. An opaque, very dense white that mixes well with all colors. An excellent all-around white appropriate for both oil- and water-based colours. The most recent of the white pigments to be developed, this pigment, which dates to about 1915, occupies an important position in the white family.

Zinc White
Zinc oxide, which dates back to 18th century painting, was first manufactured by the French chemist Courtois. A stable, non-toxic, semi-transparent pigment that mixes well with all colours. Use it in thin layers, or in combination with titanium white. Used most frequently in oil, gouache, and watercolour. Suitable for fresco.

Blacks

In its pure state, black does not literally exist. In fact, all substances that appear black actually have the capacity to absorb the entire range of colours found in white light.

Ivory Black
Carbon from animal bones calcified in a vase, rather than ivory tusks as was in the past. A warm, intense black that turns brownish when mixed with white. Very good lightfastness. In oil painting, requires large amouts of binder. Does not dry well. Suitable for all techniques, but in fresco, Black for Fresco is preferable.

Black for Fresco
Carbon smoke soot. This black works especially well for fresco, for which it is primarily used, but is entirely suitable for all techniques. Very lightfast.

Mars Black
Iron oxide. This synthetic black is durable and very lightfast. Creates cool gray shades. Suitable for all techniques including fresco.

Ochres

Ochres have been in use since prehistory. These coloured clays, which contain iron oxide found in the earth, generally come from France and Italy. These natural pigments are perfectly lightfast and suitable for all techniques, especially for fresco (with the exception of brown ochre).

Yellow Ochre
Natural, clay-base yellow. A warm, slightly transparent colour.

Red Ochre
Calcified yellow ochre.

Brown Ochre
Rich, dark brown formulated from natural clays and synthetic pigments. Not recommended for fresco.

Browns

Madder Brown
Transparent "azo" pigment and extenders. Very intense, transparent, reddish brown with high tinting strength. Suitable for all techniques, except fresco.

Red Brown
Iron oxide. Good covering brown, very lightfast and stable in mixtures. Recommended for all techniques including fresco.

Van Dyck Brown
Iron oxide. Purple brown. Very lightfast and stable in mixtures. Suitable for all techniques, including fresco..

Earths

Natural earths *(Raw Sienna, Burnt Sienna, Raw Umber, Burnt Umber, Green Earth)*
All the siennas, umbers, and green earths are entirely natural and come from Italian soil. They are all natural iron oxides. The natural earth colours are completely lightfast and stable in mixtures. Colours referred to as "burnt" come from calcified native earth. Siennas and umbers require a great amount of oil in grinding. Since earths naturally have excellent drying properties, avoid adding drying agents.
Earth pigments are suitable for all techniques, and are recommended for fresco.

Reds

Cadmium Red Substitutes *(Light, Deep, Purple, and Orange)*
Nitrogenous "azo" pigments, zinc oxide, extenders. As with cadmium yellow substitutes, cadmium red substitutes are composed of several pigments reproducing the genuine cadmium shade. These colours offer :
- good lightfastness
- stability in mixtures in any binder
Suitable for oil, gouache, watercolour, and acrylic, but not recommended for fresco.

Cadmium Red Genuine *(Light, Purple, Orange and Deep)*
Sulfoselenide of cadmium. Opaque mineral pigment with excellent covering power. Completely lightfast and stable in mixtures in any binder. Suitable for all techniques, including fresco.
Do not mix with flake white.

Permanent Red Deep
Calcium lake and extenders. Synthetic organic red that imparts bright, intense carmine red shades. Good tinting strength, average lightfastness. Used mainly for decorative purposes. Not suitable for fresco.

Helios Red
Toluidine red. A brilliant organic red, extremely intense and luminous. High tinting strength, average lightfastness. Suitable for all techniques, including oil, gouache, watercolour, tempera and acrylic. Not suitable for fresco.

Mars Red
Iron oxide. Dark, rich brownish red. Provides a transparent film with an excellent tinting strength. Very lightfast and stable in mixtures. Suitable for all techniques, including fresco.

Venetian Red
Iron oxide. Vibrant brown with excellent colouring capacity. Very lightfast and stable in mixtures. Suitable for all techniques, especially fresco.

Quinacridone Red
Organic pigment with very high tinting strength ; very lightfast. An intense, vibrant red that is transparent and therefore outstanding for glazing. In mixtures with white, provides a luminous, delicate pink.

French Vermilion Substitute
The mineral known as Cinnabar dates back to antiquity; the Romans called it minium. In 1687, Schulte used mercury to create the Vermilion pigment, named after "Vermeil" (bright red). As a result of its toxicity and its poor stability, notably in mixtures with flake white, artists since the early 20th century have increasingly replaced it with this substitute, made from nitrogenous "azo" and extenders. Bright, luminous orange-red with high tinting strength. Good lightfastness. Suitable for all techniques except fresco.

Chinese Vermilion Substitute
Toluidine red and extenders. Deep, lake-like red. Average lightfastness. Suitable for all technique except fresco.

Yellows

Bright Yellow
A mixture of zinc oxide, mononitrogenous "azo" yellow, and modified arylide. A warm yellow with a good lightfastness, compatible with any binder except fresco.

Cadmium Yellow Substitute
Cadmium colours, discovered in Germany in 1817 by Stromeyer, were quickly adopted by artits, who appreciated their intensity and high tinting strength.
All dry pigments designated as substitutes are made from a combination of synthetic organic pigments that reproduce the genuine pigment colour, but at a much lower price. Cadmium yellow substitute is a stable compound of inert, mononitrogenous "azo" pigments and extenders. Very lightfast, it is stable in all binders : oil, acrylic, watercolour, gouache. For fresco use only genuine cadmium colours.

Cadmium Yellow
Cadmium sulfide. Mineral pigment providing an opaque intense yellow with good tinting strength and lightfastness. Suitable for all techniques. Do not mix with flake white or chrome yellows.

Chrome Yellow
Lead chromate. This pigment, predecessor of the cadmiums, provides excellent tinting strength and a solid, durable film. However, these pigments present certain negative aspects : in addition to their toxicity and poor lightfastness, they tend to darken over time. Unsuitable for fresco. Still used primarily because of its reasonable price, and as part of painting tradition. When used to mix greens, provides very deep, dense shades.

Lemon Yellow
Formerly used in the form of zinc yellow, whose weaknesses led to the formulation of lemon yellow from synthetic organic mononitrogenous "azo" pigments. Very good lightfastness. Suitable for use in all binders, and provides very stable mixtures. Good tinting strength. Not recommended for fresco.

Indian Yellow Substitute
Composition of nitrogenous "azo" pigments that reproduce the genuine Indian Yellow shade. Luminous, very lightfast, transparent pigment. Frequently employed for warming up hues. Suitable for all techniques except fresco.

Mars Yellow
Nitrogenous "azo" pigment and natural earth. At one time, this pigment was obtained from a concentrate of animal urine from India, but for more than 50 years, it has been reproduced with modern pigments. Transparent, very lightfast pigment. High tinting strength. Suitable for all techniques except fresco.

Naples Yellow Substitute
Documented by Cennino Cennini, the appearance of Naples Yellow has not been clearly established ; true Naples Yellow is a lead antimonate that was frequently employed in past centuries. Its properties have now been rediscovered. But since genuine Naples Yellow is toxic, this colour is a

substitute based on zinc oxide, titanium dioxide, and mononitrogenous "azo" yellow. A luminous, very lightfast colour, this yellow yields a rich, beautiful, dense paste. Suitable in all binders, including oil, watercolour, tempera and acrylic. Not suitable for fresco.

Nickel Yellow
Nickel-titanate yellow. A vibrant yellow with a slight greenish hue. Very good tinting strength, excellent lightfastness in mixtures and shades. Can be mixed with all pigments and suitable in any binder, including fresco.

Greens

English Green Light
Nitrogenous "azo" and Phthalocyanine. Provides a softly luminous green. High tinting strength. Good lightfastness and stability in mixtures. Not recommended for fresco.

English Green Deep
Nitrogenous "azo" and Phthalocyanine. Deep bluish green. Powerful tinting strength. Good lightfastness, stable in mixtures. Not recommended for fresco.

Baryte Green
Chromate of baryte, Phthalocyanine, and strontium chromate. Pale, luminous green with excellent covering capacity. Average lightfastness. Because it is classified as toxic, this pigment should not be used in powdered form. Good drying properties when used in oil. Suitable for all techniques. Not recommended for fresco.

Cobalt Green Light
Combination of zinc and cobalt green. Cold, pale green with a lovely tonality, pulling toward turquoise. A pure colour with good covering power, low tinting strength. Very lightfast and stable in mixture. Suitable for all techniques, including fresco.

Emerald Green Substitute
Phthalocyanine and extenders. Close in appearance to genuine emerald green, but at a much more reasonable price. Luminous green with high tinting strength. Good lightfastness and stability in mixtures. Not recommended for fresco.

Emerald Green
In the 19th century, Pannetier created this transparent shade, which was rapidly adopted by painters for its remarkable properties, especially for glazing. "Hydrated" chromium oxide. Deep, intense green. Very good lightfastness, stable in mixture. Especially well-suited to oil glazes. Less vibrant, and with a lower tinting strength than Emerald Green Substitute. Suitable for all techniques and with all binders, especially fresco. Avoid applying it in very thick layers.

Chromium Oxide Green
Anhydrous Chromium Oxide. Dull green hue. Excellent tinting strength and covering power. Very good lightfastness and stability in mixtures. When used in oil, provides a very buttery, easy-to-use paste. Recommended for fresco.

Veronese Green
Genuine Veronese Green, which is a copper arsenate, is quite toxic. This bright, luminous hue reproduces the original with modern pigments-mononitrogenous "azo", Phthalocyanine, and extenders. Pale green tone. Luminous, good covering power, low tinting strength. Very lightfast. Suitable in all binders, except fresco.

Phthalocyanine Green
Synthetic organic pigment. Its characteristics are identical to those of Phthalocyanine Blue, but in a brillant rich green hue.

Blues

Cerulean Blue Substitute
Cerulean Blue Substitute is based on barium sulfate and phthalocyanine blue. This hue, an imitation of genuine cerulean blue, provides remarkable lightfastness. Very high tinting strength. Suitable for all techniques.

Cerulean Blue
Cobalt stannate. Invented around 1850, under the name celestial blue. Derived from cobalt blue, in a harmonious, blue-green hue. Opaque, very lightfast, stable in mixtures. Suitable for all techniques. Very precious pigment.

Cobalt Blue
Cobalt aluminate. In the 19th century, the French chemist Thénard successfully obtained this pigment from a natural mineral. A very pure blue shade. Excellent lightfastness, very stable in mixtures. Suitable for all techniques

Ultramarine Blue Light
Silico aluminate of sodium polysulfides. In 1828, the chemist Guillemet synthetically reproduced the natural colour of Lapis Lazuli, which had been in use since antiquity. Variations in the hue result from the size of its microparticles. The preparation of ultramarine blue is quite complex, and varies according to the desired individual shade. Luminous, intense blue that approaches the appearance of cobalt blue, and provides bright, pleasant effects in shading. Mixes well with other pigments, but, since it contains sulfur, should not be mixed with flake White or chrome based pigments. Suitable for all techniques.

Ultramarine Blue Deep
Silico aluminate of sodium polysulfides. Preparation identical to that of Ultramarine Blue light. A deep, very intense shade, more purple than Ultramarine Blue light. Very lightfast. An important colour on most artists' palettes. Suitable for fresco.

Prussian Blue
Ferric ferrocyanide. Discovered in Prussia at the beginning of the 18th century. Difficult to grind and moisten. Very high tinting strength. Good lightfastness (contrary to its reputation) except in oil colours, where it tends to darken. Strong, transparent tone. Dries out oily binders. Not suitable for fresco.

Indigo Blue
Indanthrone blue. Synthetic organic pigment. Reproduction of true indigo, which comes from an Indian plant. Very high tinting strength. Remarkable lightfastness. Provides a semi-opaque film. A deep, intense blue suitable for all binders, except fresco.

Azure (Hue)
Formerly produced in the form of Manganese Blue Genuine until the dangers of its manufacture led to its disappearance. Azure is made from synthetic organic pigments phthalocyanine blue and barium sulfate. Very lightfast. Suitable for all techniques, except fresco. Provides a bright, luminous, turquoise blue shade.

Cobalt Blue Deep
Cobalt aluminate. The varying temperatures at which it is calcinated (cooked) accounts for the many different shades of Cobalt Blue). Bright, deep blue with excellent lightfast properties that mixes very well with other pigments. Suitable for all techniques.

Cobalt Turquoise
Cobalt aluminate. A unique turquoise hue whose brightness cannot be matched in other mixtures. Excellent lightfastness. To retain its unique vividness in oil painting, use it with a non-yellowing oil (safflower).

Phthalocyanine Blue
Pure synthetic organic pigment with exceptionally high tinting strength. Very good lightfastness. Suitable for all techniques (except fresco). Because of its powerful tinting strength, use it with discretion. A transparent hue well-suited to glazing techniques. Provides a blue palette ranging from pale sky blue to dark, somber tones similar to Prussian blue. In mixtures, use it to create an infinite range of greens.

Violets

Cobalt Violet Deep
Cobalt phosphate. Dark purple hue, very lightfast and stable in mixtures. Low tinting strength but good covering power. Recommended for fresco.

Mineral Violet
Manganese phosphate. Red-purple hue. Good covering power, average tinting strength, good lightfastness. Suitable for all mediums except fresco and water-based techniques.

Ultramarine Violet
Silico aluminate of sodium. Mineral pigment. Suitable for all techniques including fresco. Low tinting strength. Provides a transparent, muted, red-violet film. Very lightfast.

glass muller

Lakes

Synthetic alizarin was formulated from tar in 1868 by Groebe and Libermann. It perfectly reproduces Madder (Garance), traditionally extracted from the ground root "Rubian tinctorium".

Alizarin Scarlet Lake
Nitrogenous "azo" lake. Bright, extremely luminous, transparent red. Principally used in oil, watercolour, tempera and acrylic. Average lightfastness. In oil, used primarily in glazes, because when applied in thick pastes,it is prone to cracking. Not recommended for fresco.

Alizarin Red Lake
Alizarin lake on aluminum hydrate base. Deep, transparent red with a carmine hue. Average lightfastness. High tinting strength. When used in oil, has a tendency to crack. Slow drying. Suitable for all techniques, except fresco.

Black Lake
Synthetic aniline black that is velvety and intense. In tints, takes on a slightly bluish hue. Average lightfastness. Not recommended for fresco.

Solferino Lake (Tyrian Rose)
Calcified aluminum hydrate base lake. Very bright pink. Poor lightfastness, excellent tinting strength. Because of its fugitive nature, use with discretion. Not suitable for fresco.

Iridescent Pigments

Titanium dioxide. Iridescent pigments undergo surface treatment with mica ; their level of iridescence varies according to the mica content. As a result of reflections and light interference, they may take on very different colours. Extremely lightfast, excellent covering power, non-toxic. Used for a wide range of applications, including cosmetics.
Suitable in all binders, including oils, vinyl paints, resins, etc...
Avoid grinding iridescent pigments ; grinding may destroy their "mother-of-pearl" effect.

Primary Colors

This unique range of primaries was especially developed for the Sennelier range of dry pigments. Each of these hues was formulated to offer exactly the same tinting strength, so in mixtures, they allow you to create medium hue secondary colours :

1 part yellow + 1 part red = medium orange hue.
1 part red + 1 part blue = medium purple hue.
1 part yellow + 1 part blue = medium green hue.

As a result of the equal intensity of these three primaries, the progressive mixtures of hues, mixed, remain distinct. Therefore, it is not necessary to add white to maintain the purity of these mixtures. All three have excellent lightfastness.

Primary Blue
Phthalocyanine pigment and extenders. Very lightfast. Good tinting strength. Suitable for all techniques, including oil, gouache, watercolour, tempera and acrylic.

Primary Yellow
Nitrogenous "azo" pigment and extenders. Very lightfast. Good tinting strength. Can be used in all techniques : oil, gouache, watercolour, tempera and acrylic.

Primary Red
Quinacridone pigment and extenders. Very lightfast. Good tinting strength. Suitable for all techniques, including oil, gouache, watercolour, tempera and acrylic.

Metallics : Copper, Yellow Gold, Red Gold

Metallic pigments produced from metal alloy powders that have undergone surface treatment. Suitable for all oil and water-based binders except acrylic and fresco. Apply a varnish over metallic colors to prevent oxidation.

Fluorescent Pigments

Fluorescence, which results from the pigments' ability to transform light, provides unique tonalities that only exist outside nature. These pigments are extremely unstable, and are recommended only for temporary artworks. Very poor lightfastness. Not recommended for fresco.

Phosphorescent Pigments : Yellow-green

Inorganic, phosphorescent Zinc sulfide powders. Recommended for use with water-based binders (except fresco). Since excessive grinding weakens their phosphorescent qualities, pigments should be mixed gently with a binder, or ground lightly.
Humidity and ultraviolet rays can darken these pigments. If the colours are exposed to direct light, keep the humidity of the environment under 50%. Applied in favourable conditions, the special properties of these pigments can last for years.

L.F. : *Lightfastness*
★★★ : *Very good lightfastness*
★★ : *Good lightfastness*
★ : *Average lightfastness*
o : *Poor lightfastness*

O : *Opaque*
T : *Transparent*
S/O : *Semi-opaque*

Name	Nº	Pigments	L.F.	O/T	Chemical Composition	F.	O.M.	N.G.	R.
Flake White	108	PW1	★★	S/O	Basic lead carbonate	Y	Y	Y	N
Lithopone White	128	PW5	★★★	S/O	Zinc sulfide, barium sulfate	Y	Y	Y	Y
Marly White	131	PW18	★★★	S/O	Natural chalk carbonate	Y	Y	Y	Y
Titanium White	116	PW6	★★★	O	Titanium oxide	Y	Y	Y	Y
Zinc White	119	PW4	★★★	S/O	Zinc oxide	N	Y	Y	Y
Primary Blue	385	PB15	★★★	S/O	Phthalocyanine blue, minerals	N	Y	Y	Y
Azur (Hue)	320	PB15	★★★	S/O	Phthalocyanine blue, minerals	N	Y	Y	Y
Cerulean Blue Sub.	323	PB15	★★★	S/O	Phthalocyanine blue, minerals	N	Y	Y	Y
Cerulean Blue	305	PB35	★★★	O	Cobalt stannate	Y	Y	Y	Y
Cobalt Blue	307	PB72	★★★	T	Cobalt aluminate	Y	Y	Y	Y
Indigo Blue	308	PB60	★★★	S/O	Indanthrone blue	N	Y	Y	Y
Cobalt Blue Deep	309	PB74	★★★	S/O	Cobalt aluminate	Y	Y	Y	Y
Cobalt Blue Turquoise	341	PB36	★★★	S/O	Cobalt stannate	Y	Y	Y	Y
Phthalocyanine Blue	387	PB15	★★★	T	Phthalocyanine blue	N	Y	Y	Y
Ultramarine Blue Light	312	PB29	★★★	T	Silico aluminate of sodium polysulfides	Y	Y	Y	Y
Ultramarine Blue Deep	315	PB29	★★★	T	Silico aluminate of sodium polysulfides	Y	Y	Y	Y
Prussian Blue	318	PB27	★★★	T	Ferric Ferrocyanide	N	Y	Y	Y
Primary Yellow	574	PY1 PY3	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Bright Yellow	511	PY1 PR4	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Yellow Light Sub.	539	PY1 PY3	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Yellow Deep Sub.	543	PY1	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Lemon Yellow Sub.	545	PY1 PY3	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Yellow Medium Sub.	541	PY1	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Orange Yellow Sub.	547	PY1 PR4	★★	S/O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Cadmium Lemon Yellow	535	PY35	★★★	O	Cadmium sulfide	Y	Y	Y	Y
Cadmium Yellow Light	529	PY35	★★★	O	Cadmium sulfide	Y	Y	Y	Y
Cadmium Yellow Deep	533	PY35	★★★	O	Cadmium sulfide	Y	Y	Y	Y
Cadmium Yellow Medium	531	PY35	★★★	O	Cadmium sulfide	Y	Y	Y	Y
Cadmium Orange Yellow	537	PO20	★★★	O	Cadmium sulfide, cadmium selenide	Y	Y	Y	Y
Chrome Yellow Light	549	PY34	★★	O	Lead Chromate	N	Y	Y	N
Chrome Yellow Deep	551	PY34	★★	O	Lead Chromate	N	Y	Y	N
Lemon Yellow	501	PY3	★★	T	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Indian Yellow Sub.	517	PY1 PY83	★★	T	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Mars Yellow	505	PY1 PBr7	★★	T	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Naples Yellow Sub.	567	PY1	★★	O	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Nickel Yellow	576	PY53	★★★	O	Nickel titanate	Y	Y	Y	Y
Alizarin Scarlet Lake	694	PR48 :2 PY83	★★	T	Mononitrogenous “azo” pigments, extenders	N	Y	Y	Y
Alizarin Red Lake	696	PR83	★★	T	Anthraquinone	N	Y	Y	Y
Solferino Lake (Tyrian Rose)	697	PR173	o	T	Xanthene lake	N	Y	Y	Y
Black Lake	763	PBk1	★	T	Black aniline	N	Y	Y	a.
Ivory Black	755	PBk9	★★★	O	Bone black	N	Y	Y	Y
Black for Fresco	761	PBk6/7	★★★	S/O	Carbon black	Y	Y	Y	Y
Mars Black	759	PBk11	★★★	O	Synthetic iron oxide	Y	Y	Y	Y
Yellow Ochre	252	PY43	★★★	T	Natural earth	Y	Y	Y	Y
Red Ochre	259	PR102	★★★	O	Natural earth	Y	Y	Y	Y
Brown Ochre	255	PBr7 PG7	★★★	S/O	Natural earth, Phthalocyanine green	N	Y	Y	Y
Primary Red	686	PV19	★★★	S/O	Quinacridone violet	N	Y	Y	Y

F : *Suitable for fresco*
O.M. : *Suitable for oil binders (oils, alkyds, resins...)*
G.N. : *Suitable for natural gums (water)*
R. : *Suitable for acrylic resins, vinyls (water)*

N : *No*
Y : *Yes*
a. : *Avoid*
n.a. : Not applicable

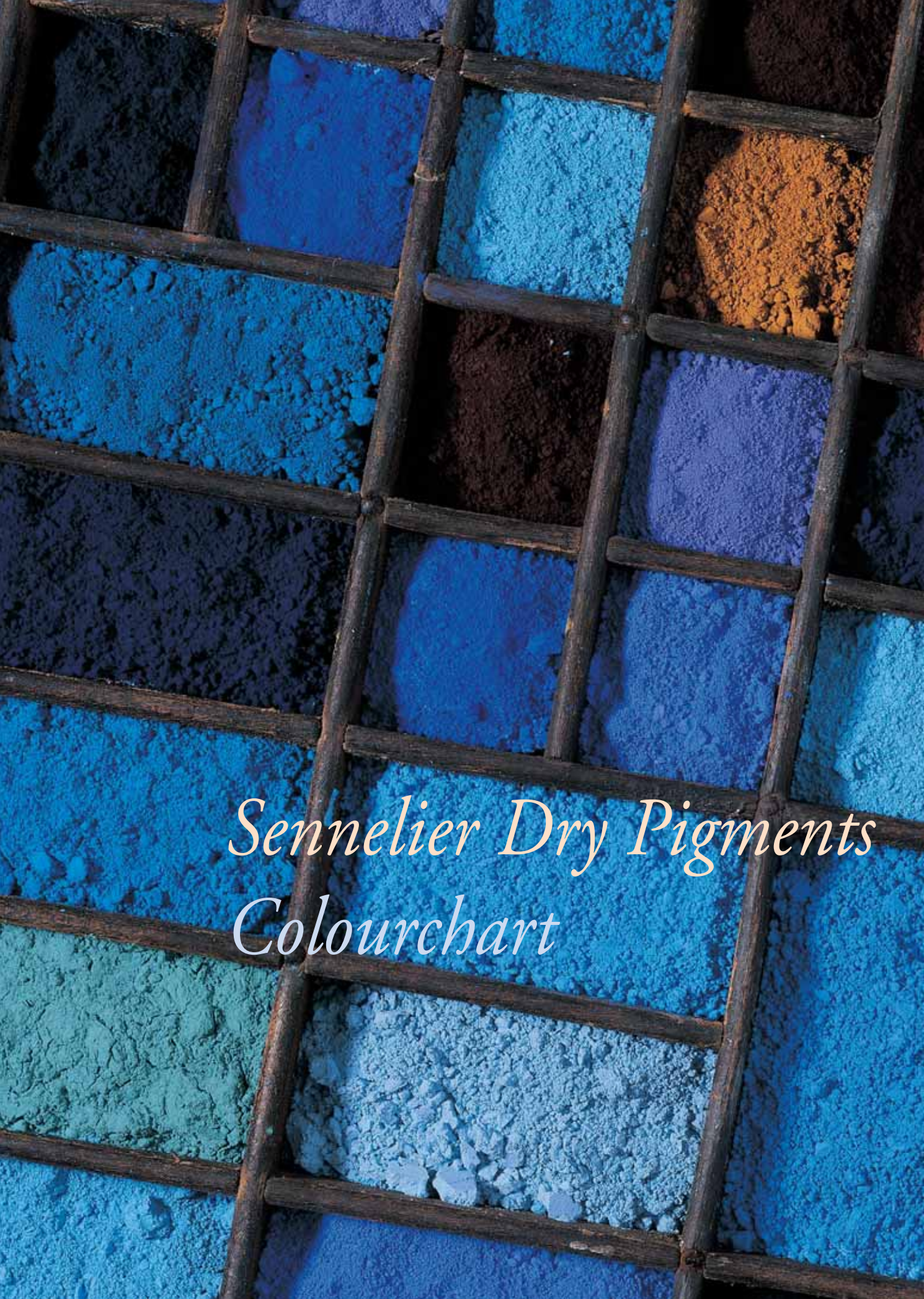
Name	Nº	Pigments		L.F.	O/T	Chemical Composition	F.	O.M.	N.G.	R.
Cadmium Red Light Sub.	613	PR4		★★	S/O	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Cadmium Red Orange Light Sub.	615	PR4	PY1	★★	S/O	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Cadmium Red Purple Light Sub.	617	PR3		★★	S/O	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Cadmium Red Light	605	PR108		★★★	O	Cadmium sulfide, cadmium selenide	Y	Y	Y	Y
Cadmium Red Deep	606	PR108		★★★	O	Cadmium sulfide, cadmium selenide	Y	Y	Y	Y
Cadmium Red Orange	609	PO20		★★★	O	Cadmium sulfide, cadmium selenide	Y	Y	Y	Y
Cadmium Red Purple	611	PR108		★★★	O	Cadmium sulfide, cadmium selenide	Y	Y	Y	Y
Permanent Red Deep	603	PR3	PR48:2	★★	T	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Helios Red	619	PR3		★★	T	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Mars Red	631	PR101		★★★	S/O	Synthetic iron oxide	Y	Y	Y	Y
Venetian Red	623	PR101		★★★	O	Synthetic iron oxide	Y	Y	Y	Y
Quinacridone Red	679	PR122		★★★	T	Quinacridone red	N	Y	Y	Y
Chinese Vermilion Sub.	677	PR3		★★	O	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
French Vermilion Sub.	675	PR4	PY1	★★	O	Mononitrogenous "azo" pigments, extenders	N	Y	Y	Y
Brown Madder	471	PBr23	PY42	★★★	S/O	Mononitrogenous "azo" pigments, iron oxide, extenders	N	Y	Y	Y
Red Brown	405	PR101	PBr7	★★★	O	Iron oxide	Y	Y	Y	Y
Van Dyck Brown	407	PBr8		★★	O	Manganese brown	Y	Y	Y	a.
Raw Umber	205	PBr7		★★★	S/O	Natural earth	Y	Y	Y	Y
Burnt Umber	202	PBr7		★★★	S/O	Natural earth	Y	Y	Y	Y
Raw Sienna	208	PBr7		★★★	T	Natural earth	Y	Y	Y	Y
Burnt Sienna	211	PBr7		★★★	T	Natural earth	Y	Y	Y	Y
Green Earth	213	PG23		★★★	T	Natural earth	Y	Y	Y	Y
English Green Light	805	PY74	PG7	★★★	S/O	Mononitrogenous "azo" pigments Phtalocyanine green	N	Y	Y	Y
English Green Deep	807	PG36		★★★	S/O	Phtalocyanine green, extenders	N	Y	Y	Y
Baryte Green	821	PY32	PY31	★★★	O	Barium chromate, strontium	N	Y	a.	a.
Cobalt Green Light	833	PG19		★★★	O	Cobalt oxide, zinc	Y	Y	Y	a.
Cobalt Green Deep	835	PG19		★★★	O	Cobalt oxide, zinc	Y	Y	Y	a.
Emerald Green Sub.	869	PG7		★★★	S/O	Phtalocyanine green, extenders	N	Y	Y	Y
Emerald Green	837	PG18		★★★	T	Chromium oxide (hydrated)	Y	Y	Y	Y
Chromium Oxide Green	815	PG17		★★★	O	Chromium oxide	Y	Y	Y	Y
Veronese Green	847	PG36	PY3	★★★	T	Phthalocyanine green, monoazo yellow pigments, extenders	N	Y	Y	Y
Phtalocyanine Green	896	PG7		★★★	T	Phtalocyanine green	N	Y	Y	Y
Cobalt Violet Deep	909	PV14		★★★	O	Cobalt phosphate	Y	Y	a.	a.
Mineral Violet	915	PV16		★★★	T	Manganese phosphate	N	Y	a.	a.
Ultramarine Violet	916	PV15		★★★	T	Silico aluminate of sodium	Y	Y	Y	Y
Copper	36	none		★★	n.a.	Powdered metal alloys	N	Y	a.	Y
Red Gold	40	none		★★	n.a.	Powdered metal alloys	N	Y	a.	Y
Yellow Gold	30	none		★★	n.a.	Powdered metal alloys	N	Y	a.	Y
Iridescent	20	none		★★★	n.a.	Mica, titanium dioxide	N	Y	Y	Y
Phosphorescent	10	none		n.a.	n.a.	Phosphorescent pigments	N	Y	Y	Y
Fluorescent Yellow	502	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y
Fluorescent Orange	648	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y
Fluorescent Red	604	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y
Fluorescent Pink	654	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y
Fluorescent Green	895	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y
Fluorescent Blue	304	none		o	n.a.	Fluorescent pigment	N	Y	Y	Y

These descriptions are merely suggestions ; Sennelier cannot be held responsible for results obtained.

From azure and granite.
De caeruleo et usta.

The preparation of blue (azure) was primarily invented in Alexandria, and Vestorius has since established the fabrication in Pouzzoles. Its invention is admirable, given the substances with which the colour is composed. Sand is ground with flower of nitrate as fine as flour ; it is mixed with copper filings from Cyprus, and is moistened with a little bit of water to make paste, from which several balls are formed by hand, and it is left to dry ; then, from these balls, an earthenware jar is formed and placed into the furnace, and there, the copper and sand reheated and dried by the fire, their liquid passing from one to the other, each leaving its nature behind and being transformed into a single body of azure blue.
That which is granite, which is very often employed in the beginning stages of a painting, is prepared in this way. In the fire, a morsel of good silt is reddened, then extinguished in vinegar, which gives it a purple colour.

Vitruve. The Ten Books of Architecture, Chapter XI



Sennelier Dry Pigments Colourchart

Sennelier Dry Pigments Colourchart

128 *** S/O •
Lithopone White
PW5

131 *** S/O •
Blanc de Meudon or Marly White
PW18

116 *** O
Titanium White
PW6

119 *** S/O
Zinc White
PW4

385 *** S/O
Primary Blue
PB15

320 *** S/O
Azure (Hue)
PB15

387 *** T
Phthalocyanine Blue
PB15

312 *** T
Ultramarine Blue Light
PB29

315 *** T
Ultramarine Blue Deep
PB29

318 *** T
Prussian Blue
PB27

574 ** S/O
Primary Yellow
PY1 PY3

511 ** S/O
Bright Yellow
PY1 PR4

529 *** O
Cadmium Yellow Light
PY35

533 *** O
Cadmium Yellow Deep
PY35

531 *** O
Cadmium Yellow Medium
PY35

537 *** O
Cadmium Yellow Orange
PO20

501 ** T
Lemon Yellow
PY3

517 ** T
Indian Yellow Sub.
PY1 PY83

755 *** O
Ivory Black
PBk9

761 *** T/O
Black for Fresco
PBk6/7

759 *** O
Mars Black
PBk11

252 *** T
Yellow Ochre
PY43

259 *** O
Red Ochre
PR102

255 *** S/O
Brown Ochre
PBr7 PG7

609 *** O
Cadmium Red Orange
PO20

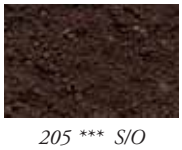
611 *** O
Cadmium Red Purple
PR108

603 ** T
Permanent Red Deep
PR3 PR48:2

619 ** T
Helios Red
PR3

631 *** S/O
Mars Red
PR101

623 *** O
Venetian Red
PR101

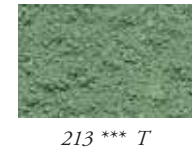


205 *** S/O
Raw Umber
PBr7

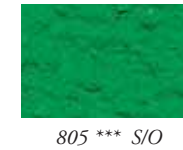
202 *** S/O
Burnt Umber
PBr7

208 *** T
Raw Sienna
PBr7

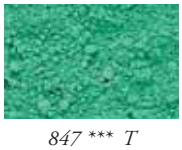
211 *** T
Burnt Sienna
PBr7



213 *** T
Green Earth
PG23

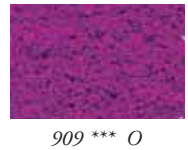


805 *** S/O
English Green Light
PY74 PG7

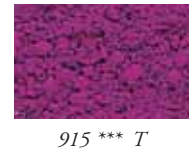


847 *** T
Green Veronese
PG36 PY3

896 *** T
Phthalocyanine Green
PG7



909 *** O
Cobalt Violet Deep
PV14



915 *** T
Mineral Violet
PV16

916 *** T
Ultramarine Violet
PV15

36 **
Copper

502 o
Fluorescent Yellow

648 o
Fluorescent Orange

604 o
Fluorescent Red

654 o
Fluorescent Pink

895 o
Fluorescent Green

304 o
Fluorescent Blue

*323 *** S/O*
Cerulean Blue Sub.
PB15

*305 *** O*
Cerulean Blue
PB35

*307 *** T*
Cobalt Blue
PB72

*308 *** S/O*
Indigo Blue
PB60

*309 *** S/O*
Cobalt Blue Deep
PB74

*341 *** S/O*
Cobalt Turquoise
PB36

*539 ** S/O*
Cad. Yellow Light Sub.
PY1 PY3

*543 ** S/O*
Cad. Yellow Deep Sub..
PY1

*545 ** S/O*
Cad. Lemon Yellow Sub.
PY1 PY3

*541 ** S/O*
Cad. Yellow Medium Sub.
PY1

*547 ** S/O*
Cad. Yellow Orange Sub.
PY1 PR4

*535 *** O*
Cadmium Lemon Yellow
PY35

*505 ** T*
Mars Yellow
PY1 PBr7

*567 ** O*
Naples Yellow Sub.
PY1

*576 *** O*
Nickel Yellow
PY53

*694 ** T*
Alizarin Scarlet Lake
PR48:2 PY83

*696 ** T*
Alizarin Red Lake
PR83

*763 * T*
Black Lake
PBk1

*686 *** S/O*
Primary Red
PV19

*613 ** S/O*
Cad. Red Light Sub.
PR4

*615 ** S/O*
Cad. Red Orange Sub.
PR4 PY1

*617 ** S/O*
Cad. Red Purple Sub.
PR3

*605 *** O*
Cadmium Red Light
PR108

*606 *** O*
Cadmium Red Deep
PR108

*679 *** T*
Quinacridone Red
PR122

*677 ** O*
Chinese Vermilion Sub.
PR3

*675 ** O*
French Vermilion Sub.
PR4 PY1

*471 *** S/O*
Brown Madder
PBr23 PY42

*405 *** O*
Red Brown
PR101 PBr7

*407 ** O*
Van Dyck Brown
PBr8

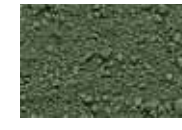
*807 *** S/O*
English Green Deep
PG36

*833 *** O*
Cobalt Green Light
PG19

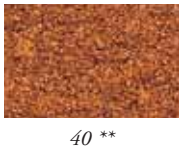
*835 *** O*
Cobalt Green Deep
PG19

*869 *** S/O*
Emeral Green Sub.
PG7

*837 *** T*
Emeral Green
PG18



*815 *** O*
Chromium Oxide Green
PG17



*40 ***
Red Gold

*30 ***
Yellow Gold

*20 ****
Iridescent

10
Phosphorescent

The shades on these swatches approximate the actual colours as closely as possible, but are limited by reproduction techniques.
These shades should only by used as approximate versions of the actual hues.

***** : *Very good lightfastness*
**** : *Good lightfastness*
*** : *Average lightfastness*
o : *Poor lightfastness*

O : *Opaque*
T : *Transparent*
S/T : *Semi-opaque*

SENNELIER

Notes on colourmaking

Water-based colours

Watercolour, gouache, and tempera require the addition of a hydroscopic product such as glycerin, which slows their drying time and makes them more flexible. The natural binder, either of animal or vegetable base, requires a preservative agent in order to preserve the integrity of the paints.

Oils colours

For all shades of oil colors, the preferred binder is refined safflower oil or linseed oil, except for whites and very pale hues, for which poppyseed oil is sometimes recommended. For grinding colours, use a glass muller on a sheet of glass or polished marble.

Be careful not to add too much oil when grinding, because the longer you grind the paint, the more fluid it becomes. Each pigment has a particular chemical nature and therefore requires specific treatment. The following are approximate guidelines for the right proportions for hand-grinding colours. Adjust them according to your particular needs.

Measurements *for 100g of pigments*

Oil colours :
30 to 100g oil
2 to 3g Courtrai drier (except for ivory black, which requires 5 to 8g)
Note : To give the paste fullness and body, you may add 1 to 3g purified beeswax

Watercolours :
50 to 100g gum arabic in 35% solution
10 to 15g glycerin
1g preservative (anti-fermenting)

Gouache :
25 to 50g gum arabic in 35% solution, or yellow (canary) dextrin
8 to 10g glycerin
1g preservative (anti-fermenting)

Egg tempera:
25 to 40g gum arabic in 35% solution
5 to 10g glycerin
1g egg yolk
1g preservative (anti-fermenting)
Note : there are many different versions of this recipe

Acrylic :
50 to 80g acrylic binding medium
1g preservative (anti-fermenting)
5 to 20g water if needed, to adjust consistency

Vinyl Colors :
40 to 50g Caparol binder
5 to 15g water if needed, to adjust texture
1g preservative (anti-fermenting)

Oil pastel :
30 to 40g beeswax or mineral wax
15 to 25g oil, Vaseline, or non-drying petroleum oil

Soft Pastels :
80 to 90g pure pigment
2 to 3g gum tragacanth, glucose, gum arabic or dextrin
+ water
1g preservative (anti-fermenting)
This concentrated solution should take on the following proportions : 1 to 3%

These measurements are suggested only as examples ; we cannot be held responsible for results obtained.

Binding mediums

In order to facilitate the use of pigments in colourmaking, Sennelier presents a unique line of binding mediums especially formulated to create a complete range of fine-art colours.

- Methyl cellulose binding medium
- Acrylic binding medium
- Caparol binding medium
- Oil paint binding medium
- Gouache binding medium
- Watercolour binding medium

Here are some characteristics of these ready-to-use products, along with some instruction on their use:

Methyl cellulose binding medium

This binding medium is used with pigments, either :
1. As a resin, for preparing traditional gouache colours.
2. As a thickening agent for pigments before making vinyl colours, acrylics or tempera paints. Note : before preparing these types of colours it is advisable to pre-thicken the pigments with a solution of the following proportions:
- 125 g methyl-cellulose binding medium
- 3 litres water
- 20 g preservative
Shake the solution well or grind it before using it for mixing pigments. Once this solution is mixed well into the pigments, add the appropriate binder (vinyl, acrylic, egg).
• Available in 250 ml jars

Acrylic binding medium

Pure acrylic (acrylic polymer) resin, 46% dry extract.
ITS USE IS IDENTICAL TO THAT OF CAPAROL BINDING MEDIUM.
Characteristics:
Glossy, transparent product suitable for interior and exterior, better stability in water than the caparol-based product.
The less methyl-cellulose binding medium used to prepare the pigments, the more the acrylic color will be water-resistant when dry.
Provides a smooth, glossy film, depending on the percentage of acrylic resin used.
Available in:
• 900 ml jars
• 5 liters cans

Caparol vinyl binding medium

Caparol vinyl binding medium, which contains a high concentration of water-soluble polyvinyl acetate was developed specifically for use with dry pigments.
This esasy-to-use medium provides a completely permanent paint film that is smooth, matte, and uniform, very similar to that of gouache.
Suitable for use with all pigments except Prussian Blue, Flake White, Chrome Yellow, Baryte Yellow, and Zinc White (these may provoke efflorescence and condensation).
Colours produced with vinyl binding medium can be safely applied one on top of another.
Vinyl paints should be applied on a non-greasy support-wood, fiberboard, sized or primed canvas, plywood, cardboard, cement, plaster, etc.
A QUICK METHOD FOR IMMEDIATE APPLICATION :
Extend the vinyl binding medium, using 10 to 25 % water.
Grind the extended binding medium well with the pigments until a homogeneous paste is obtained.
Increasing the proportion of water also increases the paint's matte qualities but diminishes its permanence.
TRADITIONAL METHOD FOR PREPARING AN EMULSION PAINT :
Create a paste by mixing a solution of 20% - 80% methyl-cellulose and the pigment desired. Then, add vinyl binding medium until a rather thick paste is obtained.
Note : Try starting out with a thick substance, using only methyl-cellulose binding medium. This allows you to add a sufficient amount of vinyl binding medium to create a uniform, permanent paint film.
• Available in 1 liter jars
• 5 liters cans

Oil binding medium

A thick, non-yellowing vegetable oil specifically developed for grinding oil colours of optimum consistency. This ready-to-use binding medium is compatible with all the pigments traditionally used in oil paint.
It includes a full, lead-free drying agent that permits normal drying time, both on the paint surface and in depth.

INSTRUCTIONS :

This binding medium can be mixed in varying proportions, according to :
1. The pigment.
2. The type of grinding.
Add this binding medium gradually during grinding until the desired paint texture is obtained.
Its viscosity makes grinding easy, and the resulting paste consistency is smooth and easy to work with, for painters with little experience in colourmaking.
• Available in 200 ml bottles
• Available in 1000 ml bottles

Gouache binding medium

Provides a matte, opaque paint that can later be reworked with water if desired.
A ready-to-use product made from natural gum, glycerin, water, and a preservative.
If the resulting paste is too thick, it can be thinned with small quantities of water without modifying the paint's opacity or matte finish.
Thin with water. For permanent colors, coat your painting with gouache varnish to protect the dry paint films.
• Available in 200 ml bottles

Watercolour binding medium

This product contains gum arabic, honey, water, and a preservative. When mixed with dry pigments, it provides a smooth, water-soluble paste with a honey-like consistency. If paints are too thick, this ready-to-use medium can be used as a thinner.
It will also maintain the watercolour's transparency and brilliance.
Thin with water (to increase the binder's fluidity, add 5 to 10% water maximum).
• Available in 200 ml bottles.

Other products

Linseed Oil

A refined linseed oil extracted from pressing the ripe seeds of the flax plant. This transparent oil, with its characteristic odour, dries quickly in contact with air. However, its sensitivity to oxygen and its acid-linoleum content give it a yellowish colour. For this reason, it is not ground with certain pigments, notably blues and whites.
Linseed oil provides a durable, easy-to-use paste with a very desirable texture.

Poppy Oil

Oil pressed from poppy seeds dries less readily than linseed oil but yellows less over time. For this reason, it is used for grinding blues and whites. The resulting paste has a less rich texture than paints ground in linseed oil.

Safflower Oil

This oil is obtained from safflower seeds, often cultivated in North America. Providing excellent drying properties similar to those of linseed oil, it also yellows much less. Safflower oil is easy to grind and yields very stable colours. Ideal for colourmaking and the preferred oil for Sennelier oil paints.

Fish glue

Fish glue, made from the inner layers of fish bladder and cartilage (50% dry extract), has been in use since antiquity, and plays a role in many traditional formulas. Until the middle of the 20th century, it was used as a universal glue for a variety of tasks, including gluing paper, cardboard, and fabric.
Fish glue is also utilized for making distemper and fabric glues and in restoration, in a 30 to 50% concentration. This reversible glue contains a preservative agent. It has good adhesive qualities, dries slowly, and comes in liquid form.
It can be used cold.

Bone glue

Used for centuries, bone glue is well known for its high quality and very strong adhesive properties. For many years, it was used in cabinetmaking, woodworking, and bookbinding. Bone glue is sold in chips that are soaked, heated and dissolved before use. Let it soak for 3 to 4 hours before dissolving it in a water bath (use a double boiler). Once softened, it should be kept over gentle heat to preserve its liquid state. Bone glue chips are generally used in high concentrations (often 30 to 50%, depending on its use) in solution. Store in a cool place .

Rabbitskin glue

Rabbitskin glue has been in use for centuries. It comes from animal skin and bones, from which collagen is extracted in gelatin form. Valued greatly for its strength and versatility, rabbitskin glue is very easy to use and comes in sheets or flakes.

Do not dissolve rabbitskin glue unless it has soaked for at least half a day, then brought to a minimum temperature of 37° or higher. Keep it gently heated to preserve it in a liquid state.
Rabbitskin glue is highly resistant to oil, hence its popularity as a size. It is so flexible that canvases prepared with rabbitskin glue can be rolled without cracking.

CAUTION : Never allow rabbitskin glue to boil during preparation. The glue will lose its adhesive properties.

Rabbitskin glue can be used as a size for canvas, as a binder for paints such as distemper, as a sizing coat for absorbent supports, and as an undercoat for gilding. Among its many other uses, it is also utilized in white gelatin.

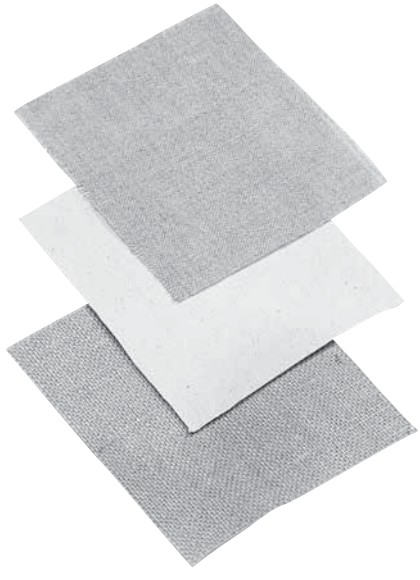
Sizing canvas with rabbit skin glue :

Sizing bonds the individual threads of the canvas. It also protects the fabric from the damaging effects of contact with vegetable based, drying oils found in oil primers and oil paints.

- 100 g rabbitskin glue,

- 900 g water.

Dissolve the glue in a water bath (double boiler) and apply it in thin layers with a brush or palette knife. The concentration may vary according to the glue's use. It is best to prepare and use glue on the same day. To save the glue for later (for 2 to 3 days at most), add 1 to 2% preservative.



Mastic Gum "tears"

"Chios" mastic "tears", a resin obtained from pistacio along the Mediterranean, comes in small, yellowish teardrops. Soluble in turpentine, this resin has been in use in mixing varnish, picture varnish, and mediums. Mastic resin dissolves slowly and must be stirred for a lengthy period ; it is then strained once or twice to eliminate impurities. It provides a clear, glossy, but somewhat brittle film that yellows over time. To combat brittleness, add Venice turpentine or stand oil.

To make painting warnish :

- 30 to 40% mastic resin

- 60 to 70% turpentine

- 3 to 5% maximum, Venice turpentine

This reversible varnish gives paintings a soft, overall sheen.

Gum arabic

A water-soluble vegetable product extracted from the African acacia tree, gum arabic comes in pale, amber-colored crystals. It is used in the preparation of watercolours, gouache and adhesive.

It is diluted slowly with constant stirring in water. Inexpensive gum arabic from Senegal is often used in making gouache. For high quality watercolours and gouache, gum arabic from Kordofan is preferred.

Instructions :

- 20 to 50% maximum,

- 5 to 10% glycerin,

- 0.5% preservative

Gum arabic provides a reversible, glossy film but due to its fragility, glycerin is added. Used as a binding medium, gum arabic provides transparent, luminous colours.

Dammar Gum

Fossil resin gathered from trees along the Philippine Islands, dammar comes in irregular, walnut-size, pale yellow chunk. Used frequently since the 18th century for making varnishes and mediums, dammar is dissolved by light stirring in solvents such as turpentine or mineral spirits. It yields a rich, glossy, reversible film.

The concentration of dammar varies between 15 and 30%, depending on the type of the solution prepared (medium or varnish).

It is recommended to add a plastifying agent such as Venice turpentine, 5% maximum.

Since dammar contains a small percentage of insoluble wax, it is slightly cloudy in solution. You can eliminate this cloudiness by leaving the solution undisturbed for several days, then straining it once or twice with a piece of cheesecloth or filter paper.

Additional products

Transparent gum lacquer

A natural gum made from insects in India or Asia from which the wax has been completely removed.
Gum lacquer was introduced in Europe in the 17th century.
Used for making varnishes, fixatives, inks, and stop-out varnish, it is soluble either :
- in borax : 3 or 4% in hot water
- or, more frequently, in ethyl alcohol

Instructions :
For alcohol varnish :
• 5 to 15% gum lacquer,
• 85 to 95% alcohol.
For fixative :
• 1 to 5% depending on the type of the fixative,
• 95 to 99% alcohol.
For stop-out varnish :
• 17 to 20% gum,
• 73 to 80% alcohol
Gum lacquer provides a glossy film with a transparent amber colour that is permanent but somewhat fragile.
Varnish made from gum lacquer should never, under any circumstances, be used in oil painting.

Beeswax

A pure natural wax available in two qualities : virgin and white.
Used in many recipes, it can be utilised as a medium in oil paints in small amounts, especially to make buttery paints for dense colours such as Flake White. Still, adding beeswax remains controversial.
Beeswax melts at about 63° and is soluble cold in turpentine or white spirits.
It is also used as a matting agent in varnishes (also in small amounts).
Beeswax is heat-sensitive and is used for making encaustic paints. As a binder, it has a good stabilizing effect, especially if the works are stored in favourable conditions.

Carnauba wax

The use of this vegetable wax dates back to the 18th century. Its melting point is 83°, higher than that of beeswax.
Carnauba wax provides a hard, dense film and is sometimes combined with beeswax to elevate the melting point and make the paint film harder and more durable.
Because of its transparency, it is also used in encaustic, or in varnish for encaustic paintings.
It provides a moisture-resistant film. It is dissolved over heat in a water bath (double boiler), in turpentine or petroleum essence.

Egg yolk

Plain egg yolk, separated from the egg white and yolk outer membrane, is a natural emulsion binder used in artists' paints since ancient times. In face, painting with colours made with egg yolk (egg tempera) has a much longer history than oil painting. Most primitive paintings were painted with egg tempera.
Prepared egg yolk contains the same properties as whole egg but in different concentrations. It can be used as either a binder or medium. Alternately, the entire egg, with egg white included, can also be used.
Use egg yolk to make a durable yet delicate water-soluble paint.
Egg yolk binder:
- 1 to 4% in (demineralized) water,
- 1 to 3% preservative. Preservative is an essential ingredient ; if eliminated, the paint will not last.

Dextrin

Dextrin, a natural vegetable extract, comes from wheat starch from potatoes, corn, and other vegetable flours.
Due to its adhesive properties, it is used as a water-soluble binder. It yields a flexible but reversible paint film.
Used in powder or paste for making gouache, it is also used in casein to give paints a smooth, glossy finish.
Instructions:
-10 to 20% depending on use,
-0.2% preservative.
Dextrin must be kept away from moisture.
As it is easy to use and inexpensive, it is often used for making children's paints.

Colophony

The distillation procedure that produces colophony, a resin made from pine-cone extract, also produces turpentine.
For centuries, colophony has had a vast number of uses, and it can be found in many ancient recipes.

Diluted in alcohol or in turpentine, colophony was most often used in varnishes, where it provides a glossy but fragile paint film.
Instructions :
- 20 to 40% in relation to solvent, depending on use.
Colophony is seldom used today because of its weakness and tendency to crack.

Asphaltum

Asphaltum, a fossil resin made from bituminous schist, was used for oil painting during the 19th century. Heat-sensitive and reversible, it also blackens over times. Asphaltum, which dissolves in white spirits or turpentine, gives a transparent brownish tinge sometimes desirable in glazes.
Its use is completely forbidden in oil painting because it has a tendency to crack or produce other surface defects.
It is used for making printmaking grounds, because of its resistance, adhesive properties, and flexibility.
To make printmaking grounds, dissolve 15 to 25% resin in a double boiler in turpentine or mineral spirits.

Pure Graphite

Natural, pure graphite in powdered form comes from Ceylon and is a form of crystallized carbon.
This mineral comes in fine granules and varies in colour form deep black to gray.
Used primarily for manufacturing drawing pencils and thicker graphite powder; it is also used in industrial paints, primarily in anti-rust and heat-resistant colours. When crushed and mixed with mineral spirits, graphite powder can also be used as a kind of ink.

Gelatin

Gelatin, an animal glue (made from collagen), has been in use for centuries.
More refined than other animal glues, it is used for delicate work such as restoration and illumination.
When bought in sheets, like rabbitskin glue, let it soak in cold water for 2 or 3 hours. Dissolve it by stirring gently in a double boiler.
Instructions :
- 5 à 15% depending on the recipe.
- 0.1 to 0.3% preservative.
Once dissolved, gelatin is difficult to store. It is better to prepare it as you work, according to your needs.

Casein

This substance, made from proteins found in milk, comes in a powder that must be kept in a well-sealed container away from moisture.
By nature, casein is insoluble in water, but it can be dissolved with ammonia, borax, or a soda solution.
However, Sennelier casein is especially treated to be water-soluble.
Once casein is in solution, add a preservative to prevent molding.
Casein can be used as a binder (use between 10 and 20%, depending on your needs) ; or as a glue, when mixed with whitewash (about 5%).
It can also serve as a stabilizer for emulsion latex paints ; it makes them insoluble, and has the same effect on certain binders.
When mixed with pigments, it makes paint with a matte, luminous surface.
Casein paint forms a permanent paint film but it should only be applied in thin layers ; it tends to crack when applied too thickly.
Instructions :
For a 10% casein binder solution:
- *10 g casein*
- *88 g water*
- *2 g ammonia*
- *0.5 g preserving agent.*

Prepare the mixture in a plastic container to avoid any contact with metal.
To make it with borax, use the same instructions, but add heat.
Casein provides paints with exceptional luminosity.

Other products

Venice turpentine

Venice turpentine, a natural balsam, comes from plant secretions also known as oleoresins, and has been in use since ancient times.
It has a viscous texture and is used as an additive in paints, painting mediums, and varnishes. It should be used in small amounts, and yields a surface that is glossy, luminous, transparent, and flexible, when used in limited amounts (no more than 5%).
Venice turpentine has an pleasant odour and can be diluted in turpentine. Its texture can vary according to climate, from pure honey to a syrupy consistency.

Stand Oil

Linseed oil heated for half a day or more in the absence of oxygen until a molecular change takes place. Also called polymerized linseed oil. This process gives stand oil a heavy, viscous texture that makes it an excellent addition to traditional oils (use up to 5%), giving colours increased gloss and resistance, and a smooth, enamel-like surface without brushmarks. When used excessively, though, paint surfaces can become viscous and sticky.
As a result of its smooth texture, stand oil is sometimes used in the preparation of dammar and mastic (4 to 5%) recipes.

Preservative

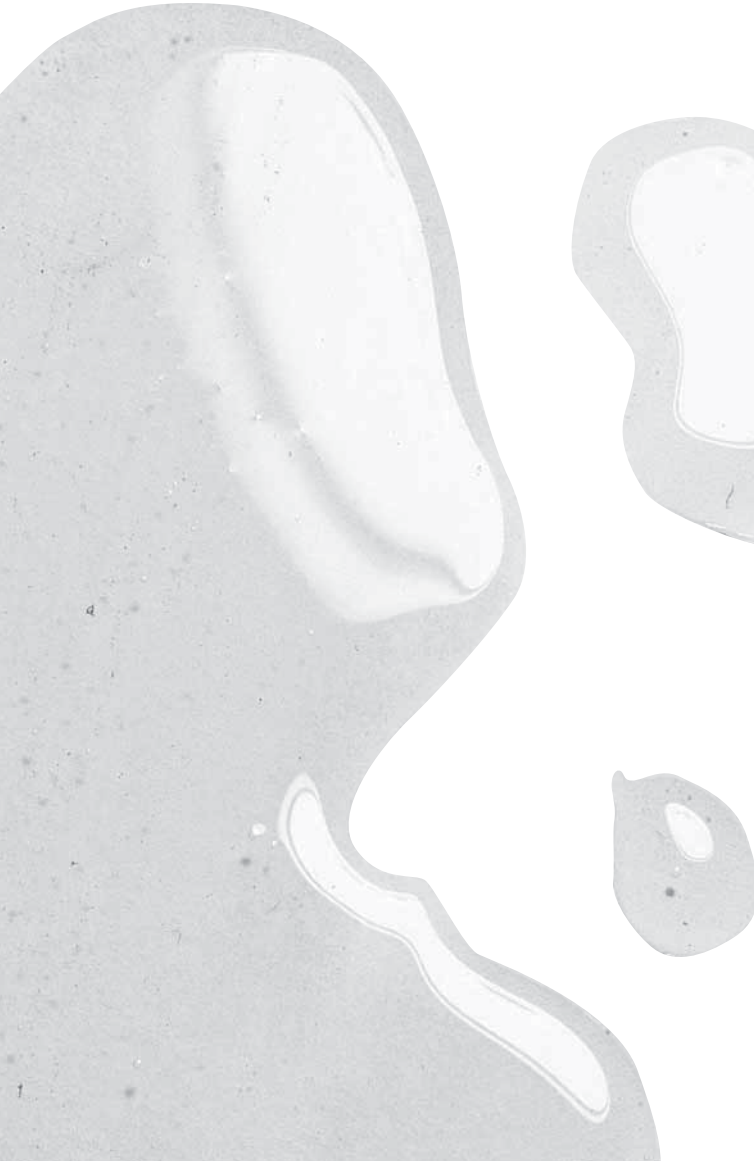
Preservative agents, which destroy or inhibit the growth of bacteria and fungus, are used to prolong the shelf life of artists' paints...
These potent products must be used with caution, always in small quantities.
They should only be added to water-based paints (1 to 2% maximum).

Driers (siccatives)

Drying agents are metallic compounds that accelerate the drying properties of oils and encourage them to solidify. They exist in different forms and different drying reactions:
Surface drying: cobalt drier
Drying in depth: lead drier, manganese drier, or zirconium, as examples.
Sennelier cobalt drier combines a variety of elements that equally promote surface drying and drying in depth. Driers should be used in small quantities: no greater than 0.5 total paint volume
Sennelier Courtrai drier improves in-depth drying: 0.5 to 3 % total paint volume.
Sennelier White siccative bolsters the natural drying properties of paint paste and can be used in greater proportions (5 to 15%).

Bronzing varnish

Bronzing varnish, a vinyl resin dissolved in alcohol, was designed to be mixed with powdered bronze pigments. Solvent : alcohol.
It provides unique effects, and in certain situations can be mixed with dry prigments.



right page : 1 Gum arabic
2 Rabbitskin glue
3 Dammar
4 Asphaltum
5 Gum lacquer
6 Mastic gum "tears"
7 Bone glue
8 Casein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