



Peregrine Brushes & Tools

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MS2A Resin Technical Information

MS2A can be applied at levels up to 50% w/w in white (mineral) spirit by spray or brush. The low molecular weight of MS2A provides a high solids, low viscosity solution.

Fast surface drying is achieved so that the no flow (gelatin) point can be reached rapidly.

Because of its excellent stability and optical properties, MS2A is most often used as one or more of the inner layers and always as the outer component of a multi-layer conservation treatment. MS2A is compatible with virtually all natural resins and plasticisers.

A low level of microcrystalline wax¹ (i.e. Cosmolloid 80H) may be added to improve plasticity and modify gloss.

Where particularly harsh UV conditions are to be encountered, incorporation of a HALS (Hindered Amine Light Stabilizer), particularly Ciba Geigy Tinuvin 292² at 2% level provides increased UV stability.³

While MS2A is effectively non-yellowing, UV catalyzed degradation may occur over a number of years outside the visible region.

MS2A has been readily removed using white (mineral) spirits more than 30 years after its initial application.⁴

Where harsh conditions have promoted a degree of degradation, a proportion of aromatic (toluene) may be combined with the white (mineral) spirit to assist varnish removal.

MS2A Technical Specification

MS2A is a pale yellow resin produced in small granule form. The material is supplied to the following specifications:

Appearance:	Pale yellow solid with mild camphor odor.
Softening Point:	> 85E C (Ring & Ball)
OH Value:	> 190mg KOH/g (acetate anhydride determination)
Ketone Content:	< 0.4 groups/1000g (hydroxyl amine hydrochloride)
Acid Value:	Practically zero
Color:	< 1.2 yellow < 0.2 red for 50% solution in white (mineral) spirit (on a standard 4cm Lovibond cell)

¹Available from Conservator's Emporium 651-450-8954 FAX 651-554-9217

²Also available from Conservator's Emporium

³E.R. de la Rie, C.W. McGlinchey "New Synthetic Resins for Picture Varnishes". Cleaning & Retouching. Eds. J.S. Mills, P. Smith (London IIC) 168-173.

⁴H.Lank. Private communication June 1994

Other Properties of MS2A

Density: 1.08

Refractive Index: 1.505

Molecular weight range: 400-1000 typical

Features of MS2A in Conservation

- # Produced specifically for the conservation of Works of Art
- # Established product - Over 30 years of successful use
- # Cost effective - MS2A contributes less than \$20 to the cost of treating a painting
- # Compatible with a wide range of solvents, plasticisers and resins
- # Particularly soluble in low polarity solvents such as white (mineral) spirits and petroleum spirits
- # Easy to apply - Up to 50% solution in white (mineral) spirit applied by brush or spray quickly reaches no flow (gel) point
- # Varnish gives excellent optical properties, similar to natural resins
- # Outstanding resistance to oxidation and chemical attack
- # Outstanding resistance to yellowing in UV light
- # Retention of solubility over many years. Old varnish is easily removed using white (mineral) spirit or white (mineral) spirit/toluene combination

Preparation, Application and Properties of MS2A Varnishes

MS2A varnish recipes are commonly based on recipes devised by Mr. Herbert Lank, reported in publishes articles and in personal communications^_. A comprehensive review of MS2A varnish formulations has been provided by Ms. Sarah Fisher (National Gallery of Art, Washington) in the Paintings Conservation Catalogm. A frequently used varnish formulation is as follows:

(A) Basic varnish for brushing or spraying:

50g MS2A Resin broken down to small granules and suspended in a muslin bag (if desired) is dissolved in 110 mls Stoddards Solvent (White Spirit to BS 245 having < 20% aromatics content). The resin dissolves overnight, or more quickly with frequent stirring and a little heating.

This varnish may be used from a spray gun as prepared or diluted with White Spirit or odorless kerosene (4 parts to 1 part diluent) to provide a more slowly drying varnish solution suitable as a brushed isolating layer.

(B) Basic matt varnish solution

7g Cosmolloid 80H microcrystalline wax is dissolved, with the aid of heating, in 150 mls White Spirit, followed by the addition of 18 mls basic varnish solution (A). The wax reduces brittleness in the dried varnish and enables the gloss to be varied.

(Note that bleached beeswax has also been used as a plasticiser/matting agent, but is not recommended due to its tendency to degrade and color with aging.)

(C) Diluted matt varnish as finishing layer.

3 parts basic solution (A) is mixed with 1 part basic matt varnish (B). This formulation diminishes the brittleness of the applied varnish without affecting the gloss. By increasing the proportion of (B) to (A) the matt effect is introduced and heightened. This is further controlled by adjusting the spray aperture and distance from the painting, and can be modified, again by gently polishing the dried varnish with a soft cloth.

Open/Working time

MS2A may be easily worked with a brush following application. Dried varnish may be reworked with additional varnish application by brush to build in uneven areas. The silky soft optical appearance is optimum in the thinnest coats.

Cleaning

Dust which may accumulate as a surface film, often over a number of years and particularly on paintings frequently transported for exhibitions, is easily removed by gently washing with distilled water, followed by gentle polishing with a soft cloth. Varnishes most affected by dust accumulation have been reported to be those containing higher levels of wax.

Aging

Accelerated aging trials have shown that oxidation/cross-linking can occur to induce slight yellowing and reduce solubility in White Spirit z. Such effects should occur much more slowly than in the case of natural or ketone resins, and should be further reduced by the addition of 2% Ciba Geigy Tinuvin 292 HALS (commonly used, particularly by conservators in the USA).

In practice, MS2A varnishes examined to date, almost 40 years after first application, and in the absence of Tinuvin 292, have remained unchanged to the naked eye in terms of gloss and clarity, and have remained fully soluble in White Spirit with no evidence of discoloration in the removed varnish.

[^] H Lank, personal communications to Linden Chemicals Ltd and to Sarah Fisher.

H Lank, Chemistry and Industry, July 1992 P484-487.

^{_} H Lank, information presented in the 1972 Lisbon Conference, published 1976

^m S L Fisher, from 'Paintings Conservation Catalog' p81-91 Nat. Gallery of Art 1997

^u Based on information supplied by M.Twist, C Booth-Jones, M.Roberts, R.Woudhuysen-Keller.

^z E R de la Rie, A M Shedrinsky, Studies in Conservation 34 9-19 (1989)

MS2A Product Safety

MS2A is not considered to be a hazardous product under National and International regulations and codes. MS2A should be regarded as harmful by ingestion and irritating to eyes. MS2A dust should be regarded as harmful by inhalation.

STORAGE & HANDLING

Containers should be stored closed under cool dry conditions. MS2A should be used with good natural or mechanical ventilation. Rubber or PVC gloves and goggles should be worn to help prevent irritation.

EXPOSURE CONTROLS

Occupational Exposure Limits for dust apply. (5mg/m⁵ for respirable dusts, 10mg/m³ total dust [8 hr TWA]). Mechanical extraction should be used for solvent based formulations where natural ventilation is poor.

STABILITY & REACTIVITY

MS2A is stable under normal conditions. MS2A should not be used in confined spaces with poor ventilation. Where decomposition occurs i.e. In a fire, hazardous fumes, including carbon monoxide, may be involved.

****This information is given as a guide and does not constitute or substitute for the users own assessment of risk in their workplace. ****

P r o d u c e d b y L i n d e n C h e m i c a l s , L o n d o n

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