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# ViterPaq EP Drum Stoving Lacquer

## EPOXY PHENOLIC LINING LACQUER

**END USE** A chemically resistant coating for the internal protection of steel drums.

S**UBSTRATE** Cold reduced drum stock quality steel.

### SUBSTRATE PREPARATION

For the best protection of the steel by ViterPaq EP the steel should be selected and/or treated prior to the application of the coating. Methods of pre-treatment can be:

1. *Abrasive Blasting*

Abrasive blast cleaning has been a widely used method of surface preparation prior to coating the surface with lacquer. Steel shot or grit can be used to achieve a suitable profile. Grit achieves a rough angular profile, the average dependant on grit size. Steel shot produces a less angular profile to the surface than the expendable grit. Steel shot size would be around S230 to S330 (0.60 – 1.00mm). A suggested grit would be no coarser than G24 and more likely G17 or G12. It is suggested that a peak-to-trough profile on the steel should not exceed 45 – 60 microns for the reconditioning market. A lower profile of 15 – 40 microns is normal for new drums. Allowance must be made when coating the profiled steel with ViterPaq EP that a safe minimum film thickness of coating achieved on the peaks of the profile.
Surface dust, residue and debris from the blast cleaning operation should be removed before coating the surface with lacquer.

2. *Chemical Treatment*

The steel can be treated with pre-treatment chemicals, prior to coating with ViterPaq EP. In particular an iron phosphate coating – Granodine 606 – is suggested.

3. *Flame or Heat treatment*

The steel can be heated before applying ViterPaq EP. This burns off contaminants such as oils, liquids and some greases.

4. *Selected Clean Steel*

ViterPaq EP can be applied directly to cold reduced steel of high cleanliness. It must be stressed that the clean steel grade selected must be visibly free from grease, oil, liquid and solid contaminants.

### Assessment of Substrate Cleanliness

Graphite contaminant to the steel can be quickly measured using a Smoke Stain Reflectometer (ex Diffusion Systems Ltd). A strip of sellotape is stuck to the steel and then removed together with attached contaminant. This tape is then attached to a clean white paper and the dirt attached is measured against a clean sellotape reference. A reading of not less than 80% is taken as acceptable.

The detection of oil and grease contaminants is difficult to identify by a simple robust technique. The performance of the cured lacquer on the steel, however, can indicate if there is contamination on the steel substrate. The following performance test can be carried out on the cured lining lacquer on the proposed steel substrate.

ViterPaq EP should be applied to the dry film thickness of 15 – 20 microns. Stove as per recommendation.

i. *Film appearance* – The stoved coating should be free from all visible film faults such as pinholing, cratering and cissing.

ii. *Flexibility* – Resistance to impact. Either a Gardener 1G 1120 or sheen 805 Impact Tester can be used to specification ASTM D2794-69 or BS3900 part E3. The test is detailed on page 5 under Product Specification. The impact sustained on the reverse side should show no visible damage to the coating.

iii. *Adhesion* – To the film carry out a cross cut through the lacquer to the bare steel with sellotape pull. No lacquer should be removed from the steel.

**Application of ViterPaq EP**

ViterPaq EP can be applied by conventional or hot airless spray. The lacquer can be thinned if required using Thinners 1738 (4026 321). This adjustment will depend on the equipment and conditions used. For further information, please contact Axalta Coating Systems Technical Desk on 0121 524 2245.

**Dry Film Thickness of Lining Lacquer**

The recommended dry film thickness for ViterPaq EP is 15 – 20 microns. The film must be continuous and free from defects such as cissing and pinholes.

The dry film thickness refers to the film weight above the steel. It is stressed that a heavier lacquer application will be required over abrasive/grit blasted steel to achieve the necessary film thickness over the “peaks” of the profile.

**Stoving Schedules for ViterPaq EP**

The curing time depends on the peak metal temperature. This related to the efficiency of the oven. Cure time and temperature can also vary with the film thickness of the lacquer applied.

The following stoving times are applicable for ViterPaq EP :

| Peak Metal Temperature (°C) | Time at the peak temperature for minimum cure (minutes) | Time at the peak temperature for optimum cure (minutes) |
|---|---|---|
| 185 | 20 | 30 |
| 200 | 10 | 15 |
| 215 | 8 | 10 |
| 230 | 4 | 6 |

**These figures are a guide to cure the lining lacquer. It is recommended that oven conditions are set after testing of coating performance on-line by Axalta Coating Systems Technical Service.**

## PRODUCT SPECIFICATION

**Name** ViterPaq EP

**Reference** 3803 series

**Description** The lacquer consists of a blend of epoxy and phenolic resins. The pigments are high quality inert oxides with carbon black used in grey products.

**Colour Range**

| | |
|---|---|
| Grey | 3803 205 |
| Golden Brown | 3803 501 |
| Red Oxide | 3803 301 |
| Buff | 3803 502 |

## PROPERTIES OF WET LACQUER

ViterPaq EP will be supplied free from visible impurities and should show no signs gelation, structure or skinning. There should be no settlement.

**Supply viscosity** 75 – 85 seconds BSB4 cup @25$^{o}$C.

**Volume solids** 33 ± 3% varies with colour

**Weight Solids** 44 ± 3% varies with colour

**VOC** 603 ± 30 gm/lt varies with colour

**Specific Gravity** 0.75 – 1.05

**Opacity** The opacity of the lacquer should be such as to give good hiding at a dry film thickness of 15 microns.

**Flash Point** 35$^{o}$C (Abel Flash Point Apparatus).

**Shelf Life** The lacquers will remain suitable for their intended use for a minimum of twelve months when stored in the original unopened containers under temperate climate conditions.

## PROPERTIES OF STOVED LACQUER

Prior to supply, the lining lacquers will have undergone a series of dry film tests detailed below. For test purposes a dry film thickness of 10 - 15 microns, spray applied to a 1mm gauge of clean mild steel panel and stoved to the recommended schedule (10 minutes at 200$^{o}$C peak metal temperature) would be tested.

**Appearance**

**The stoved coating should be free from all visible film faults such as cratering, cissing and pinholing.**

**Flexibility – Resistance to Impact**

Tested by Gardener IG 1120 Impact Tester – using a 5/8" ball, 4 lbs weight – impact 200 kg/cm. Tests carried out on the reverse side of the test panels should show no visible damage to the lacquer film.

The test can also be carried out with the Sheen Impact Tester Nº 805 to BS3900 Part E3. Using 3mm washers the impact is 270 kg/cm. Impact on the reverse side of the test panel should show no visible damage to the lacquer film.

**Cure of Film – Pencil Hardness**

Apply lamb's wool cloth wetted with acetone to the surface of the film for 5 minutes. Then test the surface by the Pencil Hardness Test. The film should, under these test conditions, pass a minimum of 4H.

**Solvent Resistance Test – Acetone Rub**

A piece of lamb's wool cloth soaked in acetone is rubbed vigorously back and forth across the lacquer film, applying steady pressure. There should be no lacquer removal after 100 double rubs. This test can also be used with methyl ethyl ketone instead of acetone; a similar result on coating performance is achieved.

## DIRECT CONTACT WITH FOODSTUFFS

ViterPaq EP is formulated to comply with the appropriate Section 175.300 of the regulations issued by the US Food and Drug Administration covering materials permitted to be in contact with food.

The product is unsuitable for contact with food in the form in which it is supplied. It is only when applied and cured in accordance with our recommendations to meet the performance standards agreed with our customers that it can be safely used in contact with food.

**The lining lacquers have been satisfactorily used in contact with certain foods. Our products are controlled to ensure that this level of performance is maintained. The acceptability of a given lacquer for packing a specific food should be established by the customer under practical conditions.**

## Tables of Resistance Tests

The attached tables indicate the resistance to a range of chemicals for ViterPaq EP.

The data has been compiled from laboratory tests (conducted at room temperature and 40°C), package trials and from drum coatings in everyday use. The maximum chemical resistance of these lacquers will be achieved only if the correct procedure for surface preparation, application and cure are adhered to. This information is given in the Product Information Sheet.

It is the responsibility of the user to be satisfied that the lacquer lined drum or container is suitable for the proposed cargo.

Please note that the term 'discontinued' means that the tests were carried out for 9 or 12 months with all results satisfactory. The test was then discontinued.

### VITERPAQ EP - RESISTANCE TESTING

| Product Under Test | Satisfactory Time of Test (months) | Comments/Results |
|---|---|---|
| Acetal | 6 | 9 months slight cracking |
| Acetic Acid (3%)/Sodium Chloride (5%) – Pickle solution | 12 | Discontinued |
| Acetic Acid (10%) | 12 | Slight cracking |
| Acetic Acid (50%) | 6 | 9 months blistered |
| Acetone | 12 | Slight softening |
| Acetone Cyanohydrin | 9 | Discontinued |
| Acid Activator | 12 | Discontinued |
| Acid Activator | 4 | 5 months blistered |
| Acid Butyl Phosphate | 12 | Discontinued |
| Acrylic Acid | 9 | Discontinued |
| Acrylic Emulsion AC55 | 12 | Discontinued |
| Amyl Acetate | 12 | Discontinued |
| 0-Anisidine | 5 | 6 months slight softening |
| Armeen DMCD | 12 | Discontinued |
| Armosol H | 12 | Discontinued |
| Astol H | 12 | Slight discolouration |
| Benzene | 12 | Discontinued |
| Benzene Sulphonyl Chloride | 6 | 9 months film lifted |
| Benzoyl Chloride | 12 | Discontinued |
| Breon Latex V6480 | 12 | Discontinued |
| Brine (10%) | 12 | Discontinued |
| Butakon Latices ML501 | 6 | Samples gelled |
| Butakon Latices ML590 | 9 | Samples gelled |
| Butakon Latices SL101 | 9 | Samples gelled |
| 150 Butanol | 12 | Discontinued |
| Butyl Acetate | 12 | Discontinued |
| Iso-Butyl Methacrylate | 12 | Discontinued |
| n-Butyl Methacrylate | 12 | Discontinued |
| Calamine Cream | 12 | Discontinued |
| Calaroc MB | 12 | Discontinued |
| Calatac UB | 12 | Discontinued |
| Gasoline Oil HS | 12 | Discontinued |
| Caprylic Acid | 12 | Discontinued |
| Carbon tetrachloride | 12 | Discontinued |

| Product Under Test | Satisfactory Time of Test (months) | Comments/Results |
|---|---|---|
| Carboxylic Acid (C7-C20 branched) | 12 | Discontinued |
| Carbowax PEG350 | 12 | Discontinued |
| Carbowax PEG550 | 12 | Discontinued |
| Cereclor (all grades) | 12 | Discontinued |
| Chloroform | 12 | Discontinued |
| Choline Chloride | 12 | Discontinued |
| Cirrasol ACN | 12 | Discontinued |
| Cirrasolxl | 12 | Discontinued |
| Citric Acid (25% & 50%) | 12 | Discontinued |
| Citroflex | 12 | Discontinued |
| Coconut oil fatty acid | 12 | Discontinued |
| Corvis P65/54 | 12 | Discontinued |
| Cresylic Acid | 12 | Discontinued |
| Daltogen 50 | 12 | Discontinued |
| Iso-Decanoic Acid | 12 | Discontinued |
| Deoxidine | 12 | Discontinued |
| Dettol | 12 | Discontinued |
| Diallyl Phthalate | 12 | Discontinued |
| Dibutyl Fumarate | 12 | Discontinued |
| o-Dichloro benzene | 6 | Discontinued |
| Diethanolamine | 12 | Discontinued |
| Diethyl Carbonate | 12 | Discontinued |
| Diethyl Phthalate | 12 | Discontinued |
| Diethylene Glycol | 12 | Discontinued |
| Dimethyl Ethanolamine | 12 | Discontinued |
| Dimethyl Fumarate | 12 | Discontinued |
| Diphenyl Oxide | 12 | Discontinued |
| Dipropylene Glycol | 12 | Discontinued |
| Dispersion 190 | 12 | Discontinued |
| Empicol SLE2 | 12 | Discontinued |
| Empicol TA | 12 | Discontinued |
| Ethanolamine | 5 | 6 months blisters |
| Ethyl Acetate | 12 | Discontinued |
| Ethylene Dibromide | 12 | Discontinued |
| Ethylene Glycol | 12 | Discontinued |
| 2-ethyl Hexyl Methacrylate | 12 | Discontinued |
| 2-Ethoxy Ethyl Methacrylate | 12 | Discontinued |
| Fertiliser (liquid chrysanthamum) | 12 | Discontinued |
| Formalin | 9 | Sample Solid |
| Formic Acid (25%) | 12 | Discontinued |
| Furfural | 12 | Discontinued |
| Gluconic Acid | 12 | Discontinued |
| Gramoxone | 12 | Discontinued |
| Hybrazine Hydrate (64% solid) | 12 | Discontinued |
| Hydrochloric Acid (1%) | 12 | Discontinued |
| Hydrochloric Acid (25%) | 3 | 4 months blistered |
| Hydroxy Ethyl Methacrylate | 12 | Discontinued |
| Kephos 253 | 12 | Slight surface defect |
| Kilsan | 12 | Discontinued |
| Lactic Acid (80%) | 12 | Discontinued |
| Lauryl Methacrylate | 12 | Discontinued |

| Product Under Test | Satisfactory Time of Test (months) | Comments/Results |
|---|---|---|
| Lissapol D | 12 | Discontinued |
| Lissapol NX | 12 | Discontinued |
| Lubrol MOA | 12 | Discontinued |
| Metaldehyde | 12 | Discontinued |
| Methacrylate Acid | 6 | Discontinued |
| Methanol | 12 | Discontinued |
| Methanol/water 1/1 | 12 | Discontinued |
| Methyl iso-butyl Ketone | 12 | Discontinued |
| Methyl Cellosolve | 12 | Discontinued |
| Methyl Ethyl Ketone | 12 | Discontinued |
| Methyl Nadic anhydride | 12 | Discontinued |
| Methylated Spirits | 12 | Discontinued |
| Methylene Chloride | 12 | Discontinued |
| Morpholine salt of P-toluene Sulphonic Acid | 12 | Discontinued |
| Nansa 100 Liquid | 6 | Sample solidified |
| Nansa 55 Paste | 12 | Discontinued |
| Neoprene Latex | 12 | Discontinued |
| Nitrocellulose – Butanol damped | 12 | Discontinued |
| Nitrocellulose - IPS damped | 12 | Discontinued |
| 2-Nitrotoluene | 12 | Discontinued |
| Nonyl Phenol 10 ethoxylate | 12 | Discontinued |
| Nonyl Phenol 14 Ethoxylate | 12 | Discontinued |
| Iso-Octanoic Acid | 12 | Discontinued |
| Octyl Phenol 10 Ethoxylate | 12 | Discontinued |
| Octyl Phenol 14 Ethoxylate | 12 | Discontinued |
| Oleic Acid | 12 | Discontinued |
| Paraplex G41 | 12 | Discontinued |
| Paraplex G60 | 12 | Discontinued |
| Perlargonic Acid | 12 | Discontinued |
| Petrol | 12 | Discontinued |
| Perchloroethylene | 12 | Discontinued |
| Phosphoric Acid | 12 | Discontinued |
| Poly-EM (Spencer) pH 7.9 | 12 | Discontinued |
| Poly-EM (Spencer) pH 10.45 | 12 | Discontinued |
| Potassium Silicate | 12 | Discontinued |
| Propionic Acid | 12 | Discontinued |
| Iso-propyl Acetate | 12 | Discontinued |
| Iso-propyl Alcohol | 12 | Discontinued |
| Iso-propyl Nitrate | 12 | Discontinued |
| Propylene Dichloride | 12 | Discontinued |
| Propylene Glycol | 12 | Discontinued |
| Racasan | 12 | Discontinued |
| Shell DD Soil Fumigant | 12 | 5 months film lifted |
| Fluids and Surfactants (range of products) | 12 | Discontinued |
| Resins (range of products) | 12 | Discontinued |
| Elastomers (range of products) | 12 | Discontinued |
| Grease (range of products) | 12 | Discontinued |
| Silocel (range of products) | 12 | Discontinued |
| Silcodyne H (range of products) | 12 | Discontinued |

| Product Under Test | Satisfactory Time of Test (months) | Comments/Results |
|---|---|---|
| Silcolapse Antifoams (range of products) | 12 | Discontinued |
| Silcolease (range of products) | 12 | Discontinued |
| Silcoloid (range of products) | 12 | Discontinued |
| Silcoset (range of products) | 12 | Discontinued |
| Catalyst of Silicones (range of products) | 12 | Discontinued |
| Sistan | 12 | Discontinued |
| Sodium Chlorate | 12 | Discontinued |
| Sodium Hydroxide Pellets | 12 | Discontinued |
| Sodium Hydroxide solution 5% | 12 | Discontinued |
| Sodium Hydroxide solution 25% | 12 | Discontinued |
| Sodium Peroxide | 12 | Discontinued |
| Sodium Silicate | 12 | Discontinued |
| Soya Bean Oil | 12 | Discontinued |
| Stergene | 12 | Discontinued |
| Sulphuric Acid 10% | 12 | Discontinued |
| Sulphuric Acid 25% | 12 | Discontinued |
| Teepol | 12 | Discontinued |
| Tensol Cement | 3 | 4 months slightly soft |
| Tetralon A (EDTA solution) | 6 | Sample solid |
| Thermex | 12 | Discontinued |
| Toluol | 12 | Discontinued |
| Topane | 3 | Discontinued |
| Topanol OL | 3 | Discontinued |
| Trichloroethylene | 12 | Discontinued |
| Triethanolamine | 12 | Discontinued |
| Triethylene Glycol | 12 | Discontinued |
| Trpropylene Glycol | 12 | Discontinued |
| Trilene | 12 | Discontinued |
| Vandike 4010 | 12 | Discontinued |
| Vinacryl 400 | 12 | Discontinued |
| Vinyl Acetate Monomer | 12 | Discontinued |
| Vulcafor VHM | 12 | Discontinued |
| Water - distilled | 12 | Discontinued |
| Water – tap - Slough | 12 | Discontinued |
| Waxol HE | 12 | Discontinued |
| Waxol PA | 12 | Discontinued |
| Weedazol TL | 12 | Discontinued |
| Zerox | 12 | Discontinued |