



CAS No:
9003 - 08 - 1

Melamine Formaldehyde Powder Resin (MELFORES 101P)

Melfores 101 P is an unmodified melamine formaldehyde powder resin suitable for impregnation of base / decorative papers and overlay in the manufacture of high pressure decorative laminates, low pressure melamine surfaced wood boards / panels etc. it is soluble in water, clear to slightly hazy solution.

Melfores 101 P can also be used in the modification of Urea glues by physical blending, for achieving overall improved properties of the wood boards, especially for enhanced moisture resistance. This is more common in case of plywood gluing. Generally, Melfores 101 P content do not exceed 25% by weight in such mixtures. The powder resin is first dissolved in water and the solution is then blended with Urea glue.

Physical Properties of Melfores 101 P (Typical)

| | |
|---|---|
| Appearance | White free flowing powder |
| Moisture Content | < 3.0 % |
| Storage life of powder resin when stored in original packing below 20°C | > 6 months |
| Solution density / 25°C | 1.23 gm / cm ³ |
| (55 pbw powder and 45 pbw water) Solution storage life | 5 days (depends on temperature) |
| pH of solution | 9.3 – 10.5 |
| Water tolerance/ 25°C | Dilutable up to 30% solid without Precipitation |

Preparation of Impregnating Resin Solution

Generally, aqueous solutions of 40 – 60% concentration by weight of Melfores 101 P are used, however, actual percentage depends on the characteristics of the paper and the resin pick-up required for the application.

The requisite quantity of water is taken in a mixing vessel fitted with a propeller agitator. The required amount of Melfores 101 P is added in lots with the agitator running and the stirring is continued until the powder resin completely dissolved to give a uniform clear to slightly hazy solution. The dissolving process can be expedited by using warm water (40 – 50°C)

Addition of a small amount of industrial methylated spirit or isopropyl alcohol in the mix (up to a maximum of 15%

replacement of the water) improves the solubility of powder resin, faster wetting out and reduced effect on the wet strength of the paper, and lower drying time.

Storage Life of the resin solution

The usable life of the impregnating resin solution is about 5 days, depending on the temperature and dilution. If the solutions stored for longer periods, it may flocculate, which can normally be re-dissolved by warming to about 70 – 75°C. However, it should be cooled immediately to the working temperature, under stirring, to avoid further polymerization of the resin.

It is strongly recommended, however, to process and consume fresh resin solution daily.

Guidance for Impregnation and Drying of Papers

The resin solutions base of Melfores 101 P are conveniently used in all types of impregnating / coating machines. The

following typical parameters may be considered as a guide to process different types of papers for use in the manufacture of laminates.

| Material | Paper | Resin Solution (Concentration) | Impregnated and Dried Sheets | | |
|---|---------------|--------------------------------|------------------------------|--------------------|------------|
| | | | Resin* Content | Volatiles Contents | Resin Flow |
| Print Sheet (when used with overlay) | 80 – 140 gsm | 40-50% | 35-40 % | 4-6 % | - |
| Decorative base sheet (when used without overlay) | 120 – 160 gsm | 55 – 60% | 55-60% | 4-6% | 2-4% |
| Overlay | 25-40 gsm | 50% | 60-70% | 3.5-6% | 2-4% |

*As percentage of impregnated paper stock

Drying of the impregnated stocks

Drying and further polymerization of the impregnated papers may be carried out at about 90-145°C (or higher) in a vertical or horizontal type of drying tunnels and the drying time much depends on a number of factors such as the type and length of the drying tunnel, paper through put speed, resin pick-up, temperature, volatile content, resin flow required on the impregnated and dried stock etc. it is not practical to recommend optimum drying schedules with accuracy, but are best standardized by trials under actual manufacturing conditions.

The impregnated and dried paper sheets are to be stored under controlled conditions, generally below 25°C and 40% relative humidity, If exposed to higher percentage of relative humidity, there will be considerable pick up in the volatile content due to moisture ingress which in turn will affect the flow properties, surface finish, etc.

Curing / Pressing conditions

Generally, curing is carried out a press temperatures of 135 -155°C and at pressure range 800 – 1000 PSI but it is also possible to cure under low pressure laminating applications such as the surfacing of the wood boards /

panels. For achieving better surface finish and the overall improved dimensional stability of the finished products, it is recommended to cool the laminated sheets, after curing, to about 45°C while still under pressure.

Post – Forming impregnated stocks

Melfores 101 P solution can be modified by incorporating water soluble plasticizers / flexibilisers at site for use in the impregnation of paper stocks suitable for manufacture of post, forming laminates. Generally, such additives content do not exceed 15% by weight. However, the degree of modification depends on the application requirement.

Packing

Melfores 101 P is packed in multi-wall paper bags with inner polyethylene, generally 25 kgs. Net. Higher capacity packing can be considered, if necessary.

Storage

Melfores 101 P should be stored in original bags in a dry place and kept as cool as possible (below 20°C) when stored at highertemperatures, the storage stability will impair remarkably. It is very sensitive to moisture and hence the bags should be kept well closed to avoid lumps formation.



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Melamine Formaldehyde Powder Resin (MELFORES 103P)

Melfores 103P is a powder melamine formaldehyde resin used for glazing of amino molded articles. The same resin can be used for the impregnation of overlay paper also. Melfores 103P is used in powder form for glazing application, while it needs to be reconstituted into solution by dissolving in water for impregnation of paper.

When used as a glazing compound it imparts very high gloss to the surface of the molded article. The moulded articles treated with Melfores 103P display improved resistance towards water, staining, cigarette burns and abrasion.

Typical Properties

| | |
|---------------------------|---------------------------|
| Appearance | White free flowing powder |
| Volatiles (%) (105°C Hr) | < 4 |
| Storage life (25°C) | Not less than six months |

Properties of 50 % solution

| | |
|------------------------|--------------------------|
| Appearance | Clear transparent liquid |
| Density at 25°C | 1.22 approx |
| Viscosity at 25°C (cP) | 25-40 |
| pH at 25°C | 7.5 – 8.5 |
| Stability at 25°C | 24 Hours. |

Impregnation

Melfores 103 P is converted into solution by dissolving in water for impregnation application. Generally a solution of 50% concentration by weight of Melfores 103P is used. Actual concentration would depend on the characteristics of the paper and the resin pick up required.

Solution Preparation

Distilled or deionised water is recommended for the preparation of resin solution. The dissolution would be easier, if the water temperature is maintained between 25°C

– 30°C. At lower temperature the dissolution would be time consuming and if dissolved in water at higher temperature the usable life of the resin solution would be shortened. If the temperature of the resin solution is above 35°C, it is advisable to cool it to about 25°C to have optimum pot life.

Following procedure may be adopted for preparing the solution.

- The requisite quantity of water is taken in a mixing vessel fitted with agitator
- Melfores 103P is added under a agitation

- c. Stirring is continued till the powder resin completely dissolves and clear solution is formed
- d. The resin solution is filtered through a fine mesh to remove any suspended matter

Reconstitution can be carried out in a simple mixing equipment. The mixing vessel may be of stainless steel or plastic material.

Impregnation of Paper

Impregnation of paper may be carried out by any of the conventional methods.

Drying

Drying of impregnated paper is normally carried out at 80°C – 100°C. The residence time in the drying tunnel would depend on the resin pick up by the paper, temperature, type and length of the tunnel. The resin pick up by a paper may vary between 50% - 60%. The dried paper should be stored in a cool and dry place because heat and humidity would affect the quality of the paper adversely.

Pressing

The products based on amino resins are moulded in a hydraulic press under influence of heat and pressure. The platen temperature of the press would vary according to the type of moulding powder. It may be between 140°C – 170°C

1. The moulding powder is put into the mould cavity and the press is closed. It is opened after a predetermined time. The pressing time depends on the press temperature, thickness of the article and the curing characteristics of the moulding powder.

2. The impregnated paper is placed on the semi-cured article and the press is closed again giving sufficient time for the paper to cure. The time is again established practically depending on the local conditions.
3. The press is opened and Melfores 103P is distributed over the hardened surface of the article and the press is closed for the last time, in the cycle. The curing time for glazing compound depends on the temperature of the press. Normally Melfores 103P would require 20 – 50 seconds for curing.

Handling

It is advisable to wear a dust mask and hand gloves while emptying the bags. Hands should be thoroughly washed with soap and hot water at the end of the working day and before meals.

Storage

The powder resin should be stored in original bags in a cool place protected from heat and humidity. Do not keep the bags open or material exposed to atmosphere. Melfores 103P being hygroscopic would pick up moisture, which would affect the quality and performance of the product adversely. The bags which have been opened should be carefully closed before storage.

The recommended storage temperature is 20°C – 25°C

Packing

Melfores 103P is packed in multiwall paper bags with inner polyethylene liner containing 25 kgs. net.