

太尔化工(上海)有限公司
Dynea (Shanghai) Co., Ltd.



TECHNICAL DATA SHEET

Aerolite UP4116

Use Aerolite UP4116 is a powder urea-formaldehyde resin which is dissolved in water prior to use. It is delivered with a range of hardeners and modifiers resulting in an adhesive system for a wide variety of applications in the bamboo flooring industries. It is used in both cold and hot bonding, as well as under radio frequency heating conditions.

The bonds achieved with the standard hardeners will conform to interior or moisture resistant grades.

Technical Data
Aerolite UP4116

Appearance	White powder
Viscosity 25°C (glue:water=100:60)	13Poise
PH 25°C (glue: water=2:1)	8.0-8.7
Density 25°C (gluc:water=2:-1)	1.260g/cm ³

Packaging Standard export sacks, each 25kg net. The sacks can be delivered on pallets covered with shrinkable polyethylene.

Storage The resin should be stored firmly sealed in its original container in a dry and cool place (15-30°C). Under these conditions the shelf life may be one to two years.

Modifier A-932 The powder Modifiers A-932/A-942/M-765 are used with Aerolite UP4116. They are supplied in standard export bags of 25kg.

A-942 The use of A-932/A942/M-765 with Aerolite UP4116 lowers the formaldehyde emission. The properties of the adhesive such as gapfilling properties, pot life, solid content, etc are also enhanced through the addition of the modifiers.

M-765

Modifier A-932 will give the glue mix a brown color and Modifier A-942 a white color.

Hardener
H-232/231
H-240

Aerolite UP4116 is always used with a hardener. Several hardeners are available. Hardener H-232 and H-231 are hardeners for mix-in application. They are supplied as powders which is mixed with water prior to addition to the resin. They are supplied in export bags of 25 kg. H-240 is mixed directly into glue mixture. It is supplied in export bags of 20 kg.

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Pressure

The pressure is first of all determined by the density, surface smoothness, thickness tolerance of the adherends and by the assembly time. Glue being squeeze-out when the pressure is being applied, is an indication of sufficient pressure.

Normal pressure is 0.5-1.6 MPa (5-16kg/cm²), depending on the type of bonding operation and the materials to be bonded.

Pressing Times

The basic setting times with the different hardeners at different temperatures are given in the following table.

Hardener	Basic-setting times in minutes at							
	20°C	30°C	60°C	70°C	80°C	90°C	100°C	110°C
H-232/H-240	—	—	10	5	2	1.5	1	0.75

In hot bonding the pressing times (basic setting times) stated refer to glue line temperatures only and allowance must be made for the heat to travel from the press platen. Heat penetration time will vary according to the density and the moisture content of the wood and the distance to the surface.

Press Temperature	Additional time per mm distance to the farthest glue line		
	<5mm	5-10mm	>10mm
90°C	1.1min	1.3min	1.5min
100°C	1.0min	1.2min	1.4min
110°C	0.9min	1.2min	1.3min

The basic pressing times in the table applies to hot bonding in a normal, flat press. RF-heating conditions vary considerably. It depends on many factors such as the voltage and the frequency of the generator, the position of the electrodes, the electric properties of the adherends and glue and the size of the adherends. Therefore pressing times can not be estimated unless by trial under the prevailing local conditions. In glue line heating a pressing time of a few seconds can be sufficient, in through heating a few minutes, depending on the mass of the adherends. In sandwich parquet presses the RF time will normally be in the range of 30-40 seconds.

Formaldehyde Emission

The formaldehyde emissions from products bonded with a given ureaformaldehyde glue depends on a number of factors. The most important are: Glue mix formulation (hardener and amount of modifier), glue spread rate, moisture content of the adherends, the distance from the glue line to the surface, assembly time and pressing conditions.

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Glue Premix Preparation

Prior to use, the powder resin is dissolved in water together with the modifier. The recommended water temperature is 15°C to 30°C.

Aerolite UP4116	100pbw
Water	60-90pbw
Modifier A-932 or A-942	20-40pbw
Hardener H-232 or H-240	15-30pbw

A mechanical stirrer should be employed. The temperature of the water should be controlled since the mixing becomes difficult and time-consuming at too low temperature. On the other hand, at too high temperature the pot life of the final glue mixture (after addition of hardener) may be too short.

In high-speed mixers, it is recommended to first place the all the water in the mixing vessel. Next, dissolve the modifier and add the powder resin while the mixer is still running. Mix until a homogeneous solutions is obtained.

In low speed mixers, which should be equipped with wall-scrapers, place about 3/4 of the water in the mixer. Next add the modifier and the resin and mix until a homogeneous solution is obtained. Finally add the rest of the water and continue to mix.

Dissolving more resin than required for one to three day's work is not recommended, as the shelf life of the pre-mix is limited (2 days at 40°C and 5 days at 30°C).

Pot-life

When H-240 is used as hardener, potlife is 18-24 hrs at 30°C, depending on the dosage of Modifier. When H232/231 is used potlife is much shorter, ranging from 1.5 hrs to 3 hrs at different temperature.

Bamboo Preparation

The bamboo to be bonded must be of uniform thickness and the surfaces must be free from oil, fat, dust or other deposits.

Aerolite UP4116 gives the highest bond strength when the moisture content of the wood is 6% to 12%. Acceptable bond strength can even be obtained at higher moisture content, but high moisture increases the risk of veneer penetration (bleed-through) and greater formaldehyde emissions.

Glue Spread

The glue spread rate is dependent to the surface of the adherends. Normal glue spread is 120-450 g/m². On very smooth surfaces lower glue spread may be used. On the other hand, e.g. on rough surfaces, more glue must be applied.

Assembly Time

The open assembly time should be kept as short as possible. Some closed assembly time may be beneficial when mixed in hardeners are used.

The maximum assembly time depends on the glue spread rate, temperature, relative humidity and the velocity of the air flow (ventilation, draught). Hence exact figures can not be given. Normally the pressure must be applied whilst the glue is still tacky.

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The modifiers will effectively reduce the formaldehyde emission. The higher the addition of modifier the lower the formaldehyde emission.

With the recommended glue mixes it is possible to attain so-called E1 product quality.

Cleaning

Mixing and spreading equipment must be cleaned before the glue has set. This is most easily done with warm water (ca. 60 °C). Once the glue has set, it is insoluble and must be scraped off.

Safety Precautions

Aerolite UP4116 can however, be safely handled, provided certain precautions normally taken when handling chemicals are observed. Skin contact with the uncured glue should be avoided, since people with particularly sensitive skin may be affected. The wearing of impervious gloves is recommended, likewise eye protection where there is a risk of splashes. A barrier cream can be used instead of gloves. Hands and underarms should be thoroughly washed with soap and warm water before meals and at the end of each working period. Solvents must not be used. Paper towels should be used to dry the skin after washing.

The suggestions given in these notes are based on data gained from experiments and experience. However, since operating in the user's plant is beyond our control, we cannot assume responsibility for any risks or liabilities which may result from the use of our products.

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