Product Information

Powder adhesive 1312

- **Self-hardening Urea-Formaldehyde powder with low free formaldehyde emission and medium-fast reactivity.**

1312 is suitable for gluing of veneers, doors, plywoods, blockboards and furniture parts with heated pressing equipment.

Product Specification

	1312	
Product	UF Adhesive	
Delivery Form	Powder	
Colour	White	
Density	Appr. 600 kg/m^3	
pH (at time of delivery)	5 - 6 (dispersed in water 100:100 and measured at 25°C/77°F)	
Storage Life (months)	**20°C/68°F**	**30°C/86°F**
	6 months	4 months
Storage Condition	It is recommended to store the product under dry and cool conditions in well sealed bags.	
Formaldehyde Info	< 0,1% (method of analysis EN 1243)	
Glue line properties	1312 allows to obtain glue lines that will fulfil the specifications according to EN 314-2 Class 1.	

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Gluing Operation Information

Applications	Flooring Plywood Doors Veneering Board on Frame
Press Type	High Frequency Hot Press
Minimum Glue Line Temperature	70°C / 158°F

Press Time

	70°C/158°F	90°C/194°F	110°C/230°F
0,6 mm	8 min	2 min	1 min
4,0 mm	13 min	5 min	3 min
6,0 mm	19 min	7,5 min	5 min

Pot Life

15°C/59°F	20°C/68°F	30°C/86°F
-	5 hours	2 hours

Pressure	The required pressure depends mainly on the wood species, wood density, article type and used apparatus, indicatively 0,1-0,8 MPa.
Assembly Time	Open: 30 minutes Closed: 60 minutes
Mixing Ratio (by weight)	1312 100 parts by weight Water 50 parts by weight
Glue Spread	Plywood: 120 - 200 g/m² , 12 - 20 g/ft² Veneering: 90 - 150 g/m² , 9 - 15 g/ft² Board on frame: 120 - 180 g/m² , 12 - 18 g/ft²
Moisture content of wood	5 - 12%, preferable 5 - 9%
Preparation of wood	For best result the wood must be smoothly planed. For optimum bond strength the bonding operation shall take place within 24 hours after preparation.
Temperature of wood	In order to meet the given press times the temperature of the wood must not be below 20°C / 68°F.
Post curing	Needs no after curing time, can be processed directly after pressing.

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Machinery

Applicator	Roller spreaders may be ordered through our technical representative.
Mixer	n/a
Accessories	Glue chiller may be ordered through our technical representative.

Handling and HSE info

Handling	Always use gloves and goggles when handling the product.
Cleaning	Glue on skin should be washed with soap and water. For the equipment, use lukewarm water with addition of Glue wash 4450 or Washing agent 2704 (for more info see General Info). Cleaning must start before the system cures.
Waste handling **- of the products**	Glue - Is normally classified as hazardous waste (contains free formaldehyde.) Hardener - Depending on classification hardeners may be considered as hazardous waste, check the SDS (section 13). Mixed glue and hardener – Can normally be treated as non hazardous waste when fully cured. **NOTE!** There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities.
Waste water treatment **- of the waste water**	Chemical precipitation → drain* Biological treatment → drain* Mechanical precipitation → drain* * municipal sewage with biological treatment **For more info, see General Information below.** **NOTE!** There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities.
Health and Safety	For more information, see respective SDS.

For more information regarding the above mentioned data, see respective section below

Legal clause

The information is based on laboratory tests and practical experience. It is introductory and intended to help the user find the most suitable method of working. Since the user's production conditions are beyond our control, we cannot be held responsible for the results of the work which is affected by local circumstances. In each particular case testing and continuous control are recommended.

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General information in alphabetic order

Accessories (Machine)	Examples of accessories include glue chiller, day tank system, control system for glue amount, and ratio of glue and hardener. For more information about accessories, please contact your technical representative.
Applications	Examples of applications include flooring, curved plywood, foliating, doors and windows, laminated beams, assembly, veneering, upholstery, board on frame, and edge-glued panels. Our adhesives systems are developed specifically for different applications. For more information, see the section, “Gluing Operation Information.”
Applicator	Examples of applicators include the roller spreader, ribbon spreader, toothed trowel, and spray box. Recommended applicators can be found in the section, “Machinery.”
Assembly Time	Assembly time is measured from the application of adhesive to the application of full pressure to the substrate. Assembly time is comprised of open assembly time (OAT) plus closed assembly time (CAT). OAT is measured from the application of adhesive to substrate assembly. CAT is measured from substrate assembly to the application of full pressure. The OAT and the CAT are influenced by the glue spread, the moisture content in the wood, and the ambient temperature and humidity. Higher glue spread, lower temperature, and higher moisture content in the wood and in the surrounding air will extend the OAT and CAT. The OAT and CAT data should be regarded separately. The total assembly time (OAT + CAT) must be evaluated in each specific case.
Cleaning	Equipment must be cleaned with tepid water before the adhesive has cured. Cured adhesive must be removed mechanically. The use of Glue Wash 4450 or Cleaning Agent 2704 is recommended to facilitate cleaning of the glue spreader. **Glue Wash 4450;** Add 1% of Glue Wash 4450 (calculated on the rest amount of glue mixture in the spreader) to the spreader. Thereafter the spreader is left running for approximately five minutes to ensure adequate mixing. When the mixing process is complete, the spreader can be washed with tepid water. **Cleaning Agent 2704;** Empty as much of the glue-mix as possible from the roller. Pour Cleaning Agent 2704 along the entirety of the roller and let the roller rotate for approximately four minutes. Use 0.5kg of Cleaning Agent 2704 for a roller with a width of one meter. Wash the rollers with warm (60˚C / 140°F) water. To clean a ribbon spreader, add a 50/50 (by weight) solution of warm water and Cleaning Agent 2704 to the spreader. Let the solution pump around the spreader for approximately four minutes, then wash with warm water.
Formaldehyde emission	Emission of formaldehyde is measured according to official standards e.g. EN,

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information	JAS, JIS, ANSI, ASTM. To determine the exact emission level of your glued product, a product sample must be sent to an institute for measurement. For more information on emissions norms, post treatments, and related information, please contact your nearest technical representative.
Glue line properties	Examples of glue line properties include durability, water and heat resistance, cold creep, and colour. Glue line properties may also be classified according to norms and standards. The “Approvals / Product Specification” section lists glue systems approved by an external institute.
Glue spread	Glue spread is chosen according to application, type of glue system and type of substrate. A slight squeeze out of adhesive along the edge of all the joints when pressure is applied indicates adequate spread and that the total assembly time has not been exceeded. Excessive squeeze out indicates excessive glue spread, excessive pressure, or a combination of these two factors. Higher glue spread can be used when long assembly times are required. An evenly applied glue spread is important. To achieve an evenly applied spread, use a good quality applicator and keep it maintained. The optimal glue spread must be determined for each specific case. The “Glue spread / Gluing Operation Information” section provides a guideline.
Handling	Avoid direct contact with adhesives and hardeners. Always use gloves and goggles. If adhesive or hardener comes in contact with skin, immediately wash the affected area with soap and tepid water. Due to its low pH, hardener is corrosive to copper and copper-containing alloys. Steel or plastic is therefore recommended for use in direct contact with the product. The Safety Data Sheet provides information regarding health and safety. Study this information carefully.
Health and Safety	Study the Safety Data Sheet before using the products. See also Handling.
Machine Time	See Pot Life.
Miscibility	Whether a product can be mixed with another product must be determined in each specific case. Please contact your nearest technical representative for more information.
Mixer	Mixers are used for the automatic mixing of adhesive and hardener or for multi-component mixing. The mixer best suited for this system is listed in the “Machinery” section.
Mixing ratio	The adhesive and hardener should be mixed in the ratio provided in the section, “Gluing Operation Information.” If other mixing ratios are used, various factors including press times, pot lives, assembly times, and glue line quality will be affected.

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	Ensure that the adhesive and hardener have been thoroughly mixed before the mixture is used. If mixing the hardener and adhesive by hand, add the hardener to the adhesive.
Moisture content	The moisture content of the wood will affect the gluing result. High moisture content can slow the system, and for some adhesive systems, excessively high moisture content will destroy the glue line quality. In some cases, excessively low moisture content can accelerate the gluing process. The moisture content of the wood will also affect the overall quality of the end product. Moisture content that is uneven, excessively low, or excessively high can cause the material to warp, cup and become uneven. The recommended moisture content for this system is listed in the section, “Gluing Operation Information.”
pH	The “Product Specification” section lists the pH and whether that pH is measured at the time of production or the time of delivery. The pH may change over time. As long as the product is used within given storage time and stored under the recommended conditions, a small change in pH will not affect the gluing operation or quality.
Preparation of wood	For best bonding results, the surface of the substrate must be adequately prepared. For optimum bond strength, the bonding operation shall take place within 24 hours after preparation. The surface must also be free from dust, grease, oil, and other contaminants. The substrate must be carefully selected so as to achieve optimum bond line quality.
Post curing	Post curing is the time needed for the bond line to build enough strength to withstand construction. The specific post curing time required to reach full strength is dependent on the pressing time, the pressing temperature, and the post curing temperature. Curing at temperatures other than the temperatures designated in the “Gluing Operation Information” section will change the required post curing time. The adjusted post curing time must be provided by a technical advisor. For more information about post curing, see the “Post Curing Time / Gluing Operation Information” section.
Pot Life	Pot life is defined as the period of time during which the mixture of glue and hardener can be used. We measure pot lives using controlled methods of analyses, so the pot lives of different systems can be compared. The so called “machine time” is related to the pot life of a system. The machine time depends largely on the roller speed, the glue mix temperature, humidity, ambient temperature, and the turnover of glue. Because of the different processes used, and because conditions vary from process to process, it is very difficult to indicate the machine time for a specific system. The pot life can be used to provide a guideline for the machine time. The pot life and machine time can be prolonged by using a Glue Chiller. Lower temperatures translate to a longer pot life and machine time.

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Press Time	Press time is the interval of time a bonded joint should be kept under pressure before handling. We measure press times using controlled methods of analyses, so the press times of different systems can be compared. The distance provided measures from the innermost glue line to the press plate. The given press times are related to a material temperature of approximately 20°C / 68°F. If the temperature of the material is lower, the pressing time must be prolonged. The press times in the “Gluing Operation Information” section should only be used as a guideline; press times for different processes must be determined in each specific case. Numerous parameters influence the performance of the glue system, such as the condition of the press, the moisture content of the substrate, the type of construction, and the species of wood.
Press Temperature	The press times in the “Gluing Operation Information” section correspond to hot press, where the press temperature is defined as the temperature of the press plate. However, the generation of heat in the actual glue line depends on the press technology being used (see Press Type). Some adhesive systems may require special glue line temperature intervals. The press temperatures best suited for this system is listed in the section, “Gluing Operation Information.”
Press Type	The many types of available press technologies include cold press, heated press, clamp carrier, and Radio Frequency. The press type that best suited for this system is listed in the “Gluing Operation Information” section.
Pressure	This is the pressure holding the substrates together while in the glue line during the press operation, until the bond is strong enough to sustain the construction. Superfluous pressure may cause excessive squeeze out, resulting in a starved glue line. Inadequate pressure may result in poor contact between the two surfaces, causing a weak bond. General recommended pressure for wood gluing is 0.3-1.0 MPa. More exact pressure levels for different processes must be determined in each specific case in order to obtain optimal bond strength.
Storage Condition	In order to achieve the given storage life for the product, it is very important that the product is stored under the recommended conditions. The optimal storage conditions for this system can be found in the “Product Specification” section. See also Storage Life.
Storage Life (Shelf Life)	The storage life for a product is determined by parameters such as reactivity, viscosity and rheology. The storage time ends when the reactivity, viscosity or rheology transforms from a relatively stable value to a value that can affect the gluing quality. An excessively high temperature will accelerate certain chemical and physical phenomena in some products and shorten the storage life. An excessively low temperature may cause irreversible reactions during freezing, such as gel and lump formation. Humidity may also play an important role for the storage of products such as

	powder products, PUR, and hardeners for EPI. If the packaging is left open for long periods, the glue is susceptible to skin formation on the surface. To avoid skin formation, keep the packaging closed when not in use. If the viscosity has increased but the reactivity is still sufficient, the storage life of some products can be prolonged if the product can be stirred before usage. Emulsion-based products can normally be used as long as they have not separated or thickened, and show no signs of bacterial degradation (bad smell and low viscosity). Separation is evident as a visible layer of water on top of the adhesive. These descriptions are guidelines and they do not comply with all products. Always contact your nearest technical representative for assistance and recommendations. The storage life and conditions are listed in the section, “Product Specification.”
Temperature of wood	If a glue system is used for cold pressing* or pressing at low temperatures, the temperature of the wood has a significant impact on the pressing time. For example, when the incoming wood has a temperature of 10°C / 50°F, the press time is substantially longer than when the wood has a temperature of 20°C / 68°F. The temperature of the wood has greater impact when pressing at low temperatures than when pressing at temperatures above approximately 50°C / 122°F. However, pressing times will be affected even at higher pressing temperatures during colder seasons, when the temperature of the wood can drop to close to 0°C / 32°F. In order to achieve the given press times, the temperature of the wood must not fall below the minimum temperature listed in the “Temperature of wood / Gluing Operation Information” section. *cold press is defined as the absence of an external heating source like a hot press or radio frequency.
Viscosity	Viscosity is defined as the resistance to the flow of a liquid. The “Product Specification” section lists the viscosity and specifies whether the value is measured at time of production or at time of delivery. The viscosity may change over time. As long as the product used within the given storage time and stored under the recommended conditions, a small change in viscosity will affect neither the gluing operation nor quality. Viscosity is very temperature dependent; high temperature normally results in a low viscosity, and low temperature normally results in a high viscosity. In order to ensure an even viscosity of the adhesive components, the use of a Glue Chiller is recommended.
Waste handling - of the products	Glue - Is normally classified as hazardous waste (contains free formaldehyde.) Hardener - Depending on classification hardeners may be considered as hazardous waste, check the SDS (section 13). Mixed glue and hardener – Can normally be treated as non hazardous waste when fully cured. **NOTE!** There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities. If assistance is needed, contact our technical representative.

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Waste water treatment **- of the waste water**	**Chemical precipitation** → municipal sewage with biological treatment Additives 4411, 4412 and 4413 are products that shall be used to decrease the amount of glue residuals in glue waste water. The products act as flocculants, thus clustering the glue particles together, making them to sediment. After treatment, the waste water has a lower dry content, which prevents the waste water from clogging pipes and drains. The obtained sediment, when dried, can be disposed of as non-hazardous industrial waste. Collecting waste water An easy way to collect glue waste water is to use empty glue barrels. It is appropriate to have two or more barrels for this purpose, depending on the amount of waste water and the time it takes for the sediment to form after precipitation. Handling of treated waste water The treated waste water can normally not be let out directly into the drains without permission from the local authorities. Handling of sediment When a barrel is full of sediment, let it stand until the sediment has dried, preferably in high temperature (above 50°C / 122°F). The barrels with the dry sediment can thereafter be disposed of as non-hazardous industrial waste. Contact local authorities for directions on how to dispose. For more information see Product Information for 4411/4412/4413. **Mechanical Precipitation** → municipal sewage with biological treatment Mechanical precipitation (sedimentation) is used to lower the solid content of the waste water in order to minimize the risk of clogging of pipes. Sedimentation of the waste water can easily be carried out in an empty barrel or IBC container depending on the amount of wash water used. When the container is full of sludge it should be left to dry (preferably above 50°C / 122°F) and can after that normally be treated as non hazardous industrial waste. The water phase can normally not be let out directly into the drain without permission from the local authorities. **NOTE!** There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities. If assistance is needed, contact our technical representative.

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