



Product Information

M-Wood Adhesive

M-Wood Adhesive system 1969 consists of 19, which is a liquid Melamine resin adhesive, and 69, which is a liquid hardener. It is a flexible system for laminated beams to be used with either mix-in or separate application of glue and hardener load-bearing timber structures, such as laminated beams, duo- and triobeams.

19 with hardener 69 is used for applications in the woodworking industry, where there is demand for light-coloured bond-lines with high water and weather resistance.

19 with hardener 69 is tested according to EN 302 part 1 to 4 and is approved for mixing ratios between 100:30 and 100:200 according to the requirements in EN 301:2013 as a type 1 adhesive to be used in production of load-bearing timber structures. It is suitable for the production of glulam according to EN14080:2013.

The adhesive system meets the demands of following types:
EN 301-I-90-GP-0,6-MEN 301-I-90-GP-0,3-SEN 301-I-90-FJ-0,1-M

The adhesive system is also tested and approved by MPA according to DIN 68141, EN302-6 and EN302-7 and fulfills the requirements for use in the production of load-bearing timber constructions according to DIN 1052 for mixing ratio 100:30 – 100:200.

Contact Information

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Product Specification

	19	69
Product	Wood Adhesive	Hardener
Delivery Form	Liquid	Liquid
Colour	Yellow	White
Viscosity (at time of production)	30000-50000 (Brookfield LVT, sp.4, 12 rpm, 25°C)	1000-2000 (Brookfield LVT, sp.3, 12 rpm, 25°C)
pH (at time of production)	9-10 (at 25°C)	1-3 (at 25°C)
Dry content	60-62%	<1%
Formaldehyde info	<0.5%	Contains no formaldehyde
Density	1250 ±50 kg/m ³	1150 ±50 kg/m ³

Storage Conditions and Storage Life

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 the glue 19 is at temperature 15°C to 25°C.

Only short time exposure to temperatures below 10°C and above 30°C are acceptable. The product can be frozen but it must be thawed, raised to room temperature and homogenized before usage.

The optimal storage conditions for the hardener 69 is at temperature 15°C to 25°C.

Only short time exposure to temperatures below 10°C and above 30°C are acceptable. Frozen and thawed product cannot be used due to irreversible changes in the product.

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.

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.

The storage life of 19 and 69 are listed below.

Storage Life (months)		15°C	20°C	30°C
	19	5	6	8
	69	4	6	8

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Gluing Operation Information

19/69 is intended for use in the woodworking industry, for applications such as laminated beam production according to EN14080:2013, Duo- and Trio beams as well as I-beams.

Mixing Ratio

The system 19/69 is approved according to EN301:2013 to be used in the following mixing ratios:

Mixing Ratio (by weight)	100 : 30 - 200 M-Wood Adhesive : Hardener
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The adhesive and hardener shall be used in the ratios provided above. If other mixing ratios are used, various factors including press times, pot lives, assembly times, and glue line quality will be affected.

In the production of structural timber constructions, the maximum allowed deviation from the given hardener ratio is ± 2 parts by weight.

If a mixed system is used it is important to 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.

Separate application of glue and hardener

19 and 69 are optimal for use of separate application of glue and hardener for face gluing. These machines ensure correct ratio of glue and hardener is applied. Assembly times are prolonged while keeping short press times.

The use of other separate application spreaders are only allowable if the suitability of these machines have been proven for the intended use.

When glue and hardener are used in separate application no problem with pot life will occur since the glue and hardener are not mixed until being applied on the surfaces to be bonded.

The maximum allowable bond line when using separate application of resin and hardener for face lamination is 0.3 mm.

Mixed application of glue and hardener

19 and 69 can also be used as a mix-in system, preferably with automatic mixers. Here it is important to have control of the pot life, as this limits the working life with which the system can be used.

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 following pot life has been established using EN302-7. For 15°C and 30°C the same method has been used, even though this is not described in EN302-7:

	Mixing Ratio	15°C	20°C	30°C
Pot Life	100:50	20 min	50 min	5 min
	100:200	-	10 min	-

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Assembly time

Assembly time is the time from the application of adhesive to the application of full pressure to the substrate.

The total assembly time is comprised of open assembly time (OAT) plus closed assembly time (CAT). OAT is the time from the application of adhesive to substrate assembly. CAT is the time from the 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 pressure must be applied while the adhesive is still tacky.

The OAT and CAT data should be regarded separately. The total assembly time (OAT + CAT) must be evaluated in each specific case. The open assembly time should be kept as short as possible.

The following total assembly times are recommended for 1969:

	Mixing Ratio	Gluing Conditions	Maximum AT
Assembly Time, Separate application	100:50	20°C/150 g/m ²	35 min
		20°C/250 g/m ²	45 min
	100:200	20°C/350 g/m ²	10 min
		20°C/450 g/m ²	20 min
Assembly Time, Mixed in application	100:50	20°C/450 g/m ²	10 min
		100:200	20°C/450 g/m ² 2

Depending on ambient temperature, lamella temperature and lamella quality, glue amounts can be optimized for a specific production. This shall always be done in cooperation with our technical advisors.

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Pressing time

Pressing time is the interval of time a bonded joint should be kept under pressure before handling. We measure pressing times using controlled methods of analyses, so the pressing times of different systems can be compared.

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.

The given pressing times are related to a material temperature of 20°C. If the temperature of the material is lower, the pressing time must be prolonged. Material temperatures of less than 18°C are not allowed within the production of structural timber elements according to DIN 1052. The values given in table 1 and 2 are to be used as guidelines.

Pressing times can be established using DIN EN 302-6. For the production of glued laminated timber according to DIN 1052, these pressing times are typically used (see table 2 further below).

When thin bond lines (approx. 0.1 mm) are always guaranteed, shorter pressing times as compared to the ones established by using EN 302-6 can be used. These values are found in table 1 (see below). For these cases, the maximum bond line thickness has to be controlled regularly within the factory production control or proper quality of bond lines has to be controlled regularly within factory production control by means of delamination tests.

Table 1:1 Pressing time when a thin glue line (approx. 0,1 mm) is guaranteed

Pressing time when a thin glue line is guaranteed (approx. 0.1mm)	Glue joint temperature	100:50	100:200
		20°C	3 h

For mixing ratio 100:200 and a guaranteed thin glue line of approx. 0,1mm, in certain cases, a shorter pressing time than given in table 1 may be reached with specific gluing parameters. This depends on the production parameters for the production line in question. A reduced spread rate (see section glue spread) down to 200g/m², in combination with an assembly time of 10 minutes, has shown in EN302-6-tests (with the above-mentioned deviation of lower glue spread) that the pressing time can be reduced to minimally 40 minutes at 20°C.

Table 2: Pressing time according to EN 302-6

Pressing time According to EN302-6 (approx. 0.3mm)	Glue joint temperature	Mixing ratio: 100:50	Mixing Ratio: 100:200
		20°C	3.5 h

A reduction of the pressing time as compared to the figures according to EN302-6 (see table 2) is exclusively acceptable in cooperation.

The pressing time can be influenced, among other things, by the bond line thickness. In cases where a thin bondline of approximately 0.1 mm can not be guaranteed, the pressing times determined according to EN302-6 must be followed. This minimum pressing time is given below.

The given pressing times are related to the production of straight beams with a moisture content of approx.12%. When gluing curved beams or using wood with higher moisture content the pressing times have to be prolonged.

When structural beam production is conducted at an elevated temperature, either by gluing in a heated press or using high frequency curing, the pressing time can be shortened. For these special cases our technical advisors must always be consulted and before establishing gluing conditions for a specific production plant delamination tests according to EN 14080 Annex C.4.3 or C.4.4 must show results in accordance with EN 14080:2013 Table 9.

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Pressure

In laminated beam production, the necessary pressure is depending on e.g. the thickness of the lamellae and the wood species.

Lamella thickness of under 35 mm requires pressure between 0.6 – 0.8 MPa. If lamellas have thickness between 35 - 45 mm, pressure should be 0.8 MPa (grooved lamellas) or 1.0 MPa (non-grooved lamellas). For lamella thickness between 45 – 80 mm, pressure should be 0.8 – 1.0 MPa. Bear in mind that lamella thicknesses of more than 45 mm are not allowed in glulam production. Same pressure can be used when separate application of resin and hardener is used for face lamination.

Too high pressure may cause excessive adhesive squeeze out, resulting in a starved glue line.
Too low pressure may result in poor contact between the two surfaces, causing a weak bond.

Glue Spread

The glue spread used can vary, depending on what wood specie, wood moisture content, relative humidity in plant, press types, assembly times, and planing quality is used.

For the production of structural timber constructions a reduction of the glue spread, e.g. at very short assembly times, is exclusively allowed to be done together with Casco Adhesives ABs' Technical Advisors and depends on the production parameters for the production line in question. This optimization implies that the set parameters are followed and that a continuous control of the bonding quality is made by means of delamination tests.

A slight squeeze out of adhesive along the edge of all the joints when pressure is applied indicates adequate glue spread and that the total assembly time has not been exceeded.

A high squeeze out indicates excessive glue spread, very high press 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.

Moisture content of wood

The moisture content of the wood will affect the gluing result. High moisture content can slow down the system, and for some adhesive systems, excessively high moisture content will negatively affect 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 high, can cause the material to warp, cup and become uneven.

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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.

The surface must be free from dust, grease, oil, and other contaminants.

The substrate must be carefully selected so an optimum bond line quality is achieved. In order to meet the pressing times given above, lamella temperature must be at least 20°C. Material temperatures of less than 18°C are not allowed within the production of structural timber elements according to DIN 1052.

Post curing

After the pressing time, the bond line has enough strength for the construction to be handled. Full strength will be reached after a certain time, depending on the pressing time and the pressing temperature.

Post curing is the time needed for the bond line to build enough strength to reach final strength and water resistance.

The specific post curing time depends on the pressing time, the pressing temperature, lamellae temperature, and the post curing temperature.

Curing at temperatures other than 20°C section will change the required post curing time. The relevant postcuring time must be provided by our technical advisor.

Formaldehyde emission information

The glue system has been tested according to EN14080:2013 Annex A and has passed E1 at worst level conditions.

To determine the emission level of your glued product, a product sample must be sent to a testing institute for measurement.

For more information on emissions norms, post treatments, and related information, please contact our representative.

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Additional information for finger jointing

For the production of finger joints the requirements given in DIN 1052 and EN14080:2013 must be followed. Mixed application can be used. The table below highlights important bonding information:

Nominal Mixing Ratio	Mixed application: 100:50 to 200
Glue Spread	Recommended between 350 -550g/m ²
Maximum assembly time (mixed application)	7 min
Curing time	100:50 2 h 100:200 50 min
Pressure	According to EN 14080:2013

Mixed application of finger joints

When a glue mixture is used, profiled rollers or similar equipment is recommended. Mix ratios between 100:50 (glue:hardener) and 100:200 can be used. The accuracy of the ratio between glue and hardener shall be ± 3 pbw. 75% of the area of the fingers needs to be covered with glue mixture.

It is important here to check pot life, as it limits the usage of a glue mixture. The table listed under **Pot life** can be used to check the pot life at 20°C for different mix ratios. A cooled glue mixture will have longer pot life. Higher temperature will shorten the pot life.

Curing of finger joints

The minimum pressing temperature shall be +20°C, when producing according to EN14080:2013.

If Radio frequency curing (RF) is used, the temperature in the zone of the finger joint should reach a temperature of minimum 65°C.

Further treatment of finger joints

Finger jointed lamellae can be further processed directly after the finger jointing operation if the transportation equipment and the planing of the lamellae do not expose the joints for any damaging stresses. Otherwise the pressing time in the table above shall be followed.

End strength of finger joints

The time of final strength of a finger joint will depend on curing conditions and adhesive system used. For 19/69 used with a mixing ratio of 100:30 this time is 20 hrs.

Quality control of finger joints

The quality control of the finger joints must be in line with the respective product standard.

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Handling and HSE info

Cleaning

Equipments must be cleaned with lukewarm 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 1985;

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 2509;

To clean a ribbon spreader, add a 50/50 (by weight) solution of warm water and Cleaning Agent 2509 to the spreader. Let the solution pump around the spreader for approximately four minutes, then wash with warm water.

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 lukewarm water.

Due to its low pH the 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.

Miscibility

Whether a product can be mixed with another product (for example when changing the glue or the hardener to another product) must be determined in each specific case. Please contact our technical support for more information.

Waste Handling

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

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Waste Water Treatment

Chemical precipitation → municipal sewage with biological treatment.

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 wastewater is to use empty glue barrels. It is appropriate to have two or more barrels for this purpose, depending on the amount of wastewater 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). 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

Biological treatment → drain

Biological system 1122 is a biological system for treatment of such glue waste water.

The biological treatment method will reduce the formaldehyde levels in the wash water, and thereafter the wash water can normally be let out via the drain to the sewage system. This treatment is carried out in three steps; equalizing, biological process and sedimentation. The sludge resulting from the sedimentation should be left to dry (preferably above 50°C) and can after that normally be treated as non hazardous industrial waste.

Mechanical Precipitation → municipal sewage with biological treatment

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Healthy and Safety

For more information, see SDS

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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