

Technical document: TD-005, English translation

FIRESTOP Wood Application Manual

I Obligatory References

1.1. Prior to use of FIRESTOP Wood expanding fireproof coating, it is necessary to read the instructions in this TD. Producer assumes no liability for damages caused by inadequate use of products and non-compliance with these instructions.

1.2. Definitions of terms: producer, customer, fire-proof coating are given in section 1.2. of Technical document TD-002. Instructions in this TD can be changed in time due to technological improvement of the product. These changes will be noted and issued in amendments of this TD.

1.3. Additional data are available on reasonable request.

1.4. FIRESTOP Wood is coating for indoor use and it is intended for the protection of wooden elements in the interior.

II Base and Surface Preparation

2.1. Preparation:

General:

Surface preparation consists of grease and dirt removal with appropriate agents. FIRESTOP Wood is applied to a clean and dry surface.

Wood:

FIRESTOP Wood is applied directly to previously prepared wooden surface. The use of primer is not always obligatory in FIRESTOP system. Priming is recommended for the preparation and additional impregnation of wood, reduction of intumescent coatings consumption or in the case of high esthetic demands and for covering of small irregularities on wooden surfaces, as a base for the FIRESTOP Wood coating. Wood preparation prior to first coating should be in accordance with recommendations for the base coating given in the manufacturer's specification. FIRESTOP Wood should be applied onto a compatible base coating. We recommend:

PRIMTEC Wood, acrylic primer

Fireproof coating may be applied after drying (usually 24 hours). Other primers can also be acceptable. For more information, contact FIRESTOP Internacional technical service. FIRESTOP Wood should not be applied over surfaces coated with synthetic topcoats or other similar coatings. For advice, contact FIRESTOP Internacional technical service.

III Tools

Mixer:

Use 1/2" boring machine with an average or instantaneous mixer.

Pumps – airless spray gun:

- Working pressure / 1450-1750 psi (102-122 kg/cm²)
- Pumping ratio / minimum* 50:1 (*teflon packages are recommended)
- Tip size / 19-23
- Fan angle / 10-40 degrees (depending on the sprayed part)
- Hose diameter / 10 mm (inner diameter 3/8")

- Hose length / maximum 60 meters

Spray guns:

We recommend

Mfg	Model
Graco	205 591
Silver	208 663

Brush and Roller:

For application with brush and roller, ensure a continuous coat to avoid thick brush finishing. Use of a small hairy fabric roller will produce a light and lasting final layer.

Maximum wet film per layer when applied with a roller or brush is 0.51 mm. These recommendations should be in compliance with tools producer recommendations.

IV Mixing and Thinning

FIRESTOP Wood is delivered in a ready-to-use form and need no thinning. Mix well before use with a mixer, while observing the above listed instructions. If thinning is required, it is made with maximum 3%-5% water.

V Application Conditions

5.1. Temperature and atmospheric conditions

It is recommended to apply and use FIRESTOP Wood onto dry and protected wooden elements. Air temperature should be min 5°C. Relative air humidity should be below 80% for a successful application.

Conditions	Base	Ambience	Humidity
Normal	15°C - 29°C	15°C - 29°C	0 - 80%
Minimum	5°C	5°C	0%
Maximum	32°C	40°C	80%

Spraying of intumescent coating is not recommended if wind speed exceeds 5 m/s due to the large dispersal or material consumption.

If FIRESTOP Wood is wetted, it may be damaged, bubbles may occur, and the surface may be wrinkled. FIRESTOP Wood should be protected from rainfall and excessive humidity during application. FIRESTOP Wood is intended for indoor use only and must not be exposed to adverse weather conditions (even when it is over coated with top coat). Impact of precipitations (rain, snow, etc.) for shorter period and with lower intensity causes damages – cracks, blisters and lift-off of the product. They can be repaired according to data in section X of this TD. Impact of precipitations for longer period and with higher intensity causes damages which cannot be repaired and requires product removal from the surface and application of new coatings.

A special case is a system for outdoor use, consisting of a modified coating FIRESTOP Wood and the corresponding primer and top coat resistant to weathering. But even then, the intumescent coating requires previously mentioned protection from weather conditions during application until it is completely dry (as well as coating designed for interior use).

5.2. Protection of Surrounding Surfaces

Finished surfaces should be protected from damage and repeated spraying. In case of a rainfall during open-air work, profiles - support beams can be covered with PVC foil or similar material.

VI Application Procedure

Pumps – Airless Spray Gun:

An individual layer consisting of several coatings applied in swift moves enables better control of quantities,

thickness and the final layer. The maximum thickness of wet FIRESTOP Wood - WFT (wet film thickness) is 0.8 mm. In certain cases, application of two thinner layers instead one thicker is recommended. In good weather conditions (21°C) and at air circulation exceeding 2 m/s, it is possible to apply two layers per day. In any case, it must be made sure the first layer is dry.

Brush/Roller:

For application with brush, the brush has to be filled to the top. The stroke technique should be such to reduce brush marks. A short hairy roller can be used, but this will effect the look of final layer. The maximum wet film per layer when the application is with roller or brush is 0.51 mm.

Application Ratios:

At the ambience temperature of 21°C, the following ratios may be used per coating:

Method	Maximum filling
Airless spray	800 µm WFT*
Brush/roller	510 µm WFT*

*WFT – wet film thickness

Finished surfaces should be protected from damage and repeated spraying.

Special recommendation:

Organized training by qualified persons from FIRESTOP Internacional technical service is recommended to the contractors who are inexperienced in application of fireproof coating.

VII Drying Time

Drying period depends on several factors:

- Temperature
- Air circulation
- Humidity
- FIRESTOP Wood thickness
- Application method.

Great humidity and poor air circulation or low temperatures may cause prolongation of drying time and poor adhesion.

The following table shows adhesion/drying time in different conditions:

Air temperature→		10°C	20°C	30°C
Air humidity ↓	Coating thickness	With air circulation	With air circulation	With air circulation
30%	WFT 0,7 mm	3 h	2-3 h	2 h
50%	WFT 0,7 mm	3,5-4,5 h	3 h	2,5-3 h
70%	WFT 0,7 mm	8 h	6-7 h	5-6 h

The following is to be mentioned as it affects the drying time:

- Drying time of the coating is prolonged by approx. 20% if coating is done with the roller or brush (in comparison to the application with airless spray or compressor gun).
- Data listed in the table are measured on constant conditions; temperature variations will cause different values of drying time.
- Minimum drying time of the last layer prior to top coating is 15 hours.
- Drying time doubles at the temperature of 5°C or at air humidity exceeding 75%.

VIII Measurement of Coating Thickness during Application

8.1. Measurement of Coating Thickness during Application

When applying the coating, wet film thickness should be checked with a thickness gauge. It is used by inserting teeth into the wet coating. The last teeth with a coating on it, shows the thickness.

Prior to the further application, film thickness should be checked by using the electronic dry film gauge. The top coat should not be applied until the appropriate thickness of FIRESTOP Wood is applied.

It is important to ensure that the wet film is thick enough to obtain the desired film thickness after drying. During the drying process, the coating will shrink as a result of water evaporation.

The following formula can be used to calculate the desired thickness of wet film:

$$WFT* = DFT*/SOLID MATERIAL CONTENT (70) \times (100)$$

*WFT – wet film thickness DFT - dry film thickness

Dry film thickness measurement can be performed as soon as the coating is hard enough to enable reading without furrowing it.

8.2. Measurement (Gauging) of Final Coating Thickness

Dry film thickness (DFT) can be measured with gauging equipment (measuring device for dry film thickness on wood).

Measurement of the final coating thickness is made when the coating is hard enough to perform gauging without furrowing the surface.

The top decorative coating should not be applied until measured values of fireproof coating thickness are in line with the prescribed thickness.

8.3. Practical Thicknesses and Consumption

Practical coating thickness depends on desired protection period and types of wood surfaces that are protected (wooden beams, boards or other wooden elements).

<i>Fire resistance time</i>	<i>Coating thickness, μm</i>	<i>Consumption per m^2, kg</i>
30 min	300	0.55
60 min	500	0.90
90 min	1050	2.00

Practical consumption showed in previous table is increased for technology dispersal which calculates the consumer - the client, based on his equipment, application techniques and other conditions.

IX Top Coat Application

When fireproof FIRESTOP Wood coating is applied in the required DFT (dry film thickness) and when it is completely dry, a top decorative coat may be applied. We recommend the following top coats, in shades according to RAL:

CENTURION B100, alkyd synthetic enamel.

FIRESTOP wood is intended for indoor use only and must not be left exposed to the weather for a long time.

X Maintenance and Cleaning

10.1. Maintenance and reparation

Damaged parts (mentioned in section 5.1. of this TD) should be scraped off or rubbed down. Approx. 2.5 cm of the finishing coat around the damaged spot should be removed. The surface has to be clean and dry prior to

FIRESTOP Wood is applied again. The primer is to be applied in the original thickness, and it has to be dry before the final layer is applied. Small scratches and chips can be remedied with FIRESTOP putty (filler) which is applied with putty knife (single application), and when it is dry, the finishing coat is applied. Reparation is usually done by brush, and in cases of greater damages other application tools can be used (according to section III of this TD).

10.2. Cleaning

Cleaning: the pump, mixer and hose should be washed with water at least each 4 hours at 21°C and more frequently if the temperature is higher.

Cleaning due to inadequate handling: Spilled coating should be cleaned with an absorbent material. Brushes and equipment should be washed out with water and detergent immediately after use. Waste handling and environment protection in accordance with regulations are responsibility of the customer and contractor.

XI Conclusion

To our best knowledge, technical data contained herein are true and accurate as of the day of publishing and may not be modified without prior notification.

11.1. Producer liability

Producer is liable for claim that its product fire resistance is tested in accordance with valid Serbian and EN standards by certified institutes and published in certification document TD-009. Technical data contained herein (and in our other technical documents, internal standards and recommendations) are true and they can be checked only according to methods mentioned in these documents. No other warranty and liability are implied.

11.2. Trademark

FIRESTOP WOOD is a trademark of our company, legally protected in Serbian Intellectual Property Office. It is within a proprietary programme: FIRESTOP - expanding fireproof coatings – state of the art protection of steel and wooden structures: registration No. 4117, report No. A-727/08/01 and registered trademark (signet) No. 57833 shown, in the header of this document.

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XIII Signature

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