référentiel de certification

TECHNICAL SPECIFICATIONS COMMON TO THE CTB-B+ & CTB-P+ QUALITY MARKS

FCBA
INSTITUT TECHNOLOGIQUE

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COMMON TECHNICAL SPECIFICATIONS FOR THE CTB-B+ & CTB-P+ QUALITY MARKS

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FOREWORD

Improvement of the quality of the wood by selecting its performances based on its natural or conferred durability, while respecting health and the environment, involves taking a certain number of factors into account:

Natural durability of the material

The classification of the natural durability of wood species of importance in Europe is determined by European standard EN 350-2.

Durability conferred on the material after treatment

For a certain number of uses, the use of wood requires the implementation of the inextricably linked treatment procedure/treatment product, in order to confer on the wood the durability required for its intended use. The measurement of this durability defines the fitness for use or function.

The protection of wood against possible attacks from biological agents is adapted to the hazard risk levels (European standard EN 335).

The more effective the procedure, the greater the protection conferred (the effectiveness of a procedure is measured in terms of penetration)

The procedures use specific products (cf. chapter 3 of the technical specifications). The levels of protection conferred are measured in relation to a product penetration level and in relation to the effective concentration of the treatment product in the zones of wood to be protected called the critical value. The critical values are determined according to the biological agents present and the use classes.

The performance levels of the treatment products are determined on reference samples of treated wood.

CTB-P+ certification applies to wood treatment products, chemical barriers, floor and wall anti-termite treatment products, physical-chemical barriers and baiting techniques. These techniques and products are intended to protect buildings.

The treatment products are potentially hazardous (biocides) due to their formulation and ***professionals have agreed to exercise caution when using the products in order to prevent***:

- accidental risk mainly related to acute toxicity,
- chronic risk associated with repeated or permanent exposure,
- potential hazards related to the development of products and by-products over time.

This prevention must be practised at 3 levels:

- substances that are generally well-documented in terms of toxicity/ecotoxicity and quality objectives,
- preparations,
- treated wood, floors and walls (for anti-termite products) in turn.

These last two levels require ***a risk assessment*** specific to the end use of the treated material and that defines the fitness for use of the preparation. The performance of the preparations must be evaluated based on the behaviour of the standard samples

There are two steps:

- evaluation of the preparations based on current knowledge
- evaluation of the material treated with the required methods and the evaluation criteria laid down in the standards.

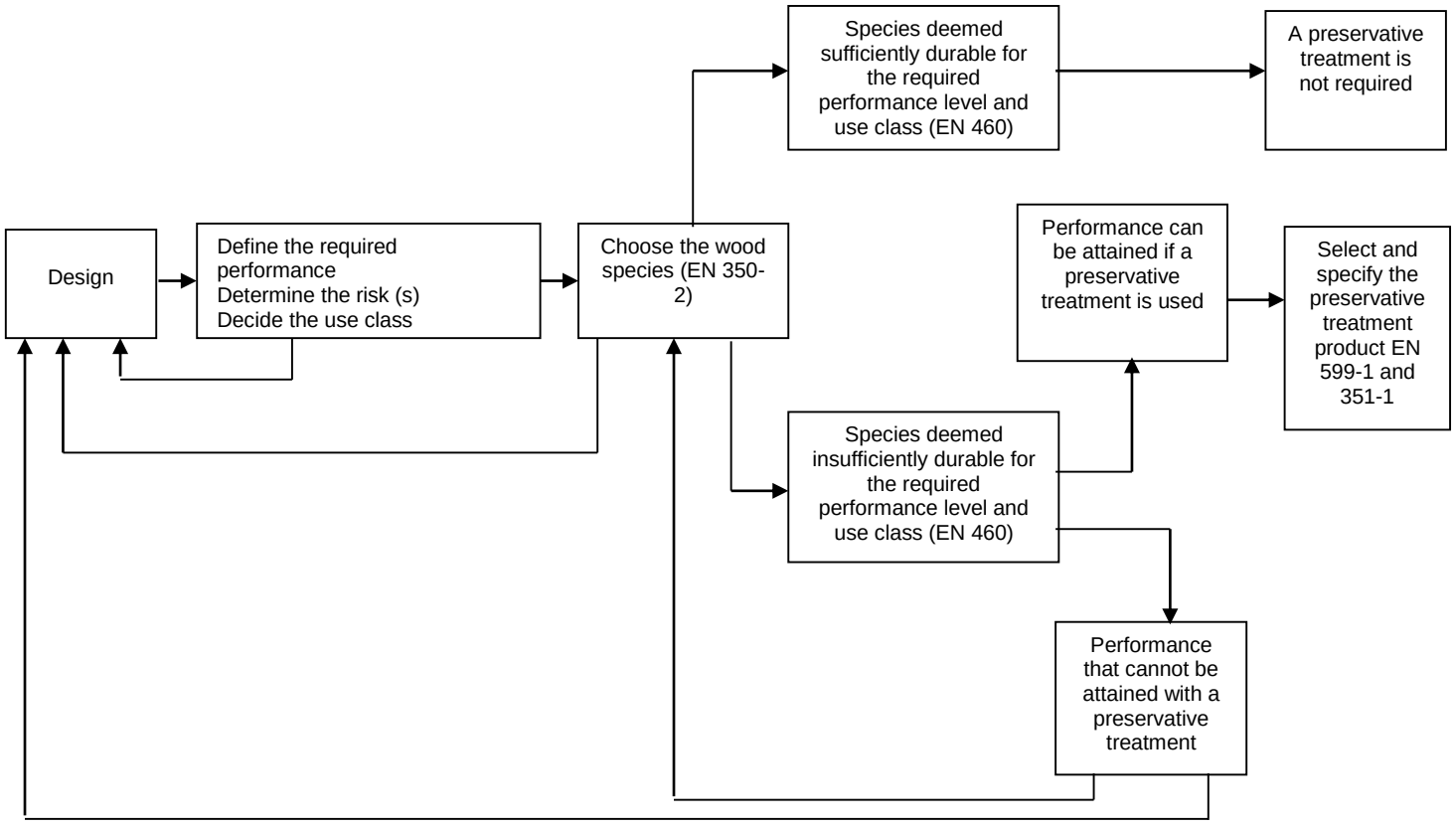
Toxicological and ecotoxicological characterisation involves an evaluation based on two exposure conditions, acute and chronic.

The purpose of certification is to protect both people in contact with the treatment products and the environment through a control to ensure compliance with regulatory criteria and recommendations. This step requires the detailed knowledge of the physico-chemical properties of the substances during the various stages of their use. This step is based a multi-disciplinary approach that, in addition to knowledge of the wood and its physical and chemical properties, requires experience in industrial hygiene, toxicology, ecotoxicology, tumorigenesis, medicine, biology and regulations.

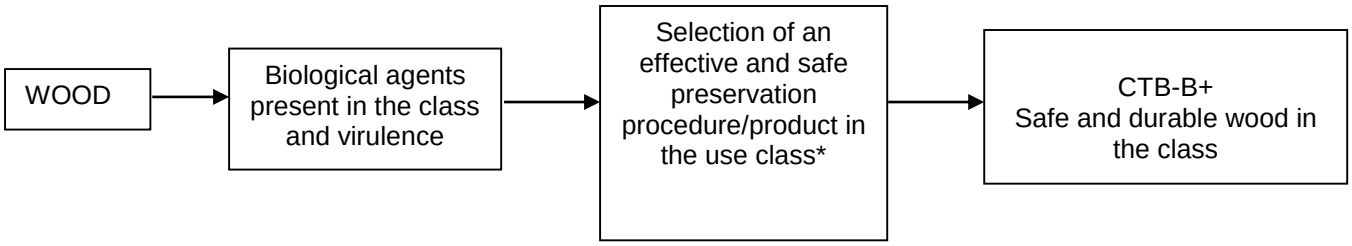
The objective is to ensure the products used in "wood treatment" remain socially acceptable without losing their efficacy. ***The efficacy and safety of the materials are managed simultaneously.***

These specifications consolidate (in addition to the rules of the CTB-B+ and CTB-P+ Quality Marks) ***the procedures and principles of the work of experts.***

General methodology



The purpose of this sequence is to determine the use class in which the wood may be used, as well as the **natural durability** of the chosen species or indeed the level of **conferred durability** that should be applied to it.



* Suitability for the use determined by CTB-P+ for efficacy and safety, or equivalent performance technique demonstrated according to a feasibility study (Chapter 5 of the CTB-P+ Regulations).

The approach followed in this decision tree consequently makes it possible to access the performance of this wood using the natural durability for all situations where the conferred durability is not applied
It results in a selection of duramen of common species based on EN 350-2 and EN 460

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Section 1

NATURAL DURABILITY

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Standard EN 350-2 classes wood species currently used in Europe by their natural durability. The classification is different for each wood-destroying biological organism in a given use class. While for wood-destroying beetles, wood is or is not durable, for termites and marine borers, the classification is adapted by means of a third intermediate class.

The classification of wood species with respect to wood-destroying fungi includes five durability classes: 1 to 5 (1= very durable; 5 = not durable). This classification only concerns the heartwood as, in all cases, sapwood is not considered durable. It was determined based on the resistance of wood in contact with the ground (EN 252).

Standard EN 460 completes the decision process described above by making parallels between these durability classes (1 to 5) and the use classes established by Standard EN 335-2.

The correlation between durability classes and use classes is not accurate in all cases; Standard EN 460 simply serves as a "usage guide".

Thus, "o" cases may be safely applied in situations where:

- durable species in class 4 are mostly graded in other classes,
- species in class 1 are not susceptible to attack by fungi.

Similarly, "x" cases indicate the need to treat species in durability classes 5, 4 and 3 in class 4 where the risk is highest.

By contrast, "(o) and (x)" represents a whole use class, where doubt over the performance of the natural material requires a feasibility study. In the absence of this information, wood classed as "(o)" and "(x)" should be treated.

The classification of selected wood species of importance in Europe has been established by Standard EN 350-2. It states the durability of species of softwood and hardwood (mainland France and tropical) with respect to the various biological agents capable of weakening the mechanical properties of the wood. These are:

- wood-destroying fungi
- wood-destroying insects (beetles)
- termites
- marine borers.

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Chapter 2

TREATMENT PROCEDURES ACCEPTED FOR CTB-P+ CERTIFICATION

The presentation technique involves a procedure/preservative association.
The protection conferred to the wood depends on the preservation technique/species impregnability combination.

In particular, these technical specifications describe:

- the procedures:
    1. brushing
    2. spraying
    3. short dipping
    4. dip diffusion
    5. Double vacuum autoclave
    6. Vacuum and Pressure autoclave
    7. hot/cold dipping
    8. other procedures
- the recognised conditions of implementation of these procedures
- the use conditions of common species

Procedures 8 must be subject to specific measures, on the one hand regarding their description, during the submission of the files, and on the other, a feasibility study referred to in the CTB-P+ Mark Technical Regulations.

The choice of preservation technique should be determined according to the performance levels required by the use classes.

Description of the procedures

- These regulations do not cover the most widely used standard procedures. It states the use classes that these procedures can cover.
- One particular case is that of diffusion dipping that only applies to wood with a moisture content much greater than the fibre saturation point. Accordingly, this procedure involves operations beyond the simple application of the product.
- Other procedures may be studied.

Comment

These sheets describing the procedures are not a substitute for the regulatory texts on the environment, safety at work, etc. Similarly, they are not a substitute for consultation of the documents relating to the chosen treatment product, which should be provided by the manufacturer.

Use classes according to standard treatment techniques

PROCEDURES	PRODUCTS	Use classes					
		1	2	3		4	5
				3.1	3.2		
Brushing	in petroleum solvent	x	x	x			
	water-soluble	x	x	x			
Spraying	in petroleum solvent	x	x	x			
	water-soluble	x	x	x			
Dipping	in petroleum solvent	x	x	x			
	water-soluble	x	x	x			
Dip-diffusion	water soluble salts	x	x	x	x		
Double vacuum autoclave	in petroleum solvent	x	x	x	x		
	water-soluble	x	x	x	x		
Pressure vacuum autoclave	oxides or salts	x	x	x	x	x	x
	creosote			x	x	x	

1 BRUSHING

This grouping comprises all applications of the treatment product used by:

- actual brushing performed with a brush, roller or portable paint gun,
- spraying devices such as low pressure guns or lances specific to curative interventions.

Conditions of access to the wood or cuts on site very often make these types of applications essential.
The performance is closely related to the professionalism of the applicator and should enable classes 1, 2 and 3.1 to be reached (cf. tunnel spraying - fixed installation).

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2. Tunnel spraying

1 - Description of the procedure

This method consists of "the abundant spraying" of all the surfaces of the wood to be treated "with a treatment product".
Spray cabins are part of this procedure

2 - Equipment

In compliance with the regulations in force.

- Chamber equipped with a brush roller at the entrance and spray jets to ensure the product covers the entire surface of the piece to be treated.
- Feed rollers enabling the piece to pass through the tunnel at a speed adapted to the flow rate of the nozzles.
- Treatment product storage tank with a circulation pump.
- Drainage table at the chamber exit.

Inspection equipment

- Hygrometer
- Possibly a refractometer, or other.

3- Treatment products

Petroleum solvents or water-dispersible products

The products used must meet the evaluation criteria set out in chapter 3 for products used for surface treatment for the given classes. In the case of control, these are conducted according to Standard EN 351-2.

Petroleum solvents

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the diluent and the dilution ratio must be specified by the manufacturer on the information label. Given the wide variation of petroleum fractions, the dilution control cannot be carried out by means of a simple procedure, such as measuring the density and viscosity, but requires chemical analysis.

Water-dispersible products

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the dilution ratio must be specified by the manufacturer. The dilution control requires the intervention of the manufacturer as well as verification, during use, of the state of the treatment solution.

Ensure to thoroughly mix the treatment solution after dilution and before use.

Avoid exposing the treatment solution to extreme temperatures (risk of freezing or evaporation) and rain water.

If the treatment solution has accidentally frozen (repeated freezing can be detrimental to its performance), ensure to thoroughly mix the solution before using it again and have it analysed by the manufacturer as quickly as possible.

Any mixing of water-dispersible products is prohibited. Indeed, such mixtures can lead to phase imbalance and the control of progressive concentrations can no longer be used to verify the continued efficacy.

However, it may be possible to mix two products made by the same manufacturer on its own responsibility, with the understanding that the controls may find non-compliance of the mixtures:

- ⇨ with certified products in terms of their composition
- ⇨ with information labels in terms of the concentrations for use

Consequently, the manufacturer should describe its mixing/substitution procedure to the Mark Committee after the FCBA have verified the compatibility of the two products and that the concentrations corresponding to the thresholds are reached for the intended concentration ranges.

4- Treatment products

a) State of the wood

↳ *Machining*
The piece should have undergone all machining

Caution*: *For planed wood,* that is difficult to impregnate, this *procedure is prohibited.

- *Moisture*

  Moisture less than 25% for petroleum solvents and 50% for water-dispersible products.

b) Descriptions of the operations

- ⇨ passage of pieces one by one under the spray jets,
- ⇨ draining.

5 - Results

Use classes 1, 2, 3.1
The performance requirements are defined in chapter 3.

Additional information

- ***Evaporation of solvents***

  - ⇨ artificial drying not recommended
  - ⇨ natural drying from a few days (light solvent and water) to several weeks (heavy solvent). Time frames vary greatly depending on the impregnability of the wood, its mode of storage and weather conditions.

- ***Retreatment of cuts***

The wood is machined before treatment, no machining should be undertaken after treatment. In the case of unexpected cuts during implementation, treat these cuts with generous brushing using a product of the same class.

Comments
It is recommended to regularly check that the nozzles are not clogged up with sawdust or wood waste and that the feed rate of the wood is in line with the flow rate of the nozzles.

It is also important to avoid the partial formation of spray (nozzle adjustment) as well as to prevent the solvent from evaporating too fast in very hot weather.

6 - Certification

To be established in compliance with French Standard NF B 50-105-3.

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3 SHORT DIPPING

1 - Description of the procedure

Procedure consisting of immersing a charge of wood in a ready to use treatment product for several minutes.

2 - Equipment

In compliance with the regulations in force.

- Dipping vessel.
- Possible a storage tank and preparation tank for the treatment solutions.
- System for lowering and keeping the charges immersed.

Control equipment (give an indication)

- Hygrometer
- Densimeter, thermometer, refractometer or other.

3- Treatment products

Petroleum solvents or water-dispersible products

The products used must meet the evaluation criteria set out in chapter 3 for products used for surface treatment for the given class(es). In the case of control, these are conducted in accordance with Standard EN 351-2.

Petroleum solvents

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the diluent and the dilution ratio must be specified on the information label by the manufacturer. Given the wide variation of petroleum fractions, the dilution control cannot be carried out by means of a simple procedure, such as measuring the density and viscosity, but requires chemical analysis.

Water-dispersible products

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the dilution ratio must be specified by the manufacturer. The dilution control may require the intervention of the manufacturer as well as verification, throughout use, of the state of the treatment solution.

Ensure to thoroughly mix the treatment solution before use.

Avoid exposing the treatment solution to extreme temperatures (risk of freezing or evaporation).

If the treatment solution has accidental frozen (repeated freezing can be detrimental to its performance), ensure to thoroughly mix the solution before using it again and have it analysed by the manufacturer as quickly as possible.

Any mixing of water-dispersible products is prohibited. Indeed, such mixtures can lead to phase imbalance and the control of progressive concentrations can no longer be used to verify the continued efficacy.

However, it may be possible to mix two products made by the same manufacturer on its own responsibility, with the understanding that the controls may find non-compliance of the mixtures:

- ⇨ with certified products in terms of their composition
- ⇨ with information labels in terms of the concentrations for use

Consequently, the manufacture should describe its mixing/substitution procedure to the Mark Committee after the FCBA have verified the compatibility of the two products and that the concentrations corresponding to the thresholds are reached for the intended concentration ranges.

Mixing products in the dipping vessels – Feasibility study (Template)

If the product is changed, following a stoppage in manufacturing, for example, the mixing of products may be tolerated for a very short time and under certain conditions:

1. the 2 certified formulations must be produced by the same manufacturer
2. a mixture feasibility study must be carried out, with penetration tests
3. the level of the vessel at the time of the mixing should be as low as possible. Firstly, the injection of the new product should be more concentrated than in standard use cases: the new product solution should always be at 100% concentration, to meet a critical value of 100 g/m².
4. the manufacturer of the product should provide charts for the different mixture proportions (e.g. 50-50%, 25-75%, etc.)
5. information from the toxicology expert with regard to Occupational Health.

4- Treatment process

a) State of the wood

- *Machining*
  The piece should have undergone all machining

  Caution: ***For planed wood, which is difficult to impregnate, the wood should be individually separated using battens.***

- *Moisture*
  Moisture less than 25% for petroleum solvents and 50% for water-dispersible products.
  In the case of round wood, significant splits will appear during drying. To avoid treating the splits afterwards, this type of wood should be treated at a moisture level of less than 25%.

The wood can sometimes be treated at a moisture content > 50%. To receive all moisture levels, the treatment products should be evaluated in accordance with a protocol given in chapter 3.1.9.

b) Descriptions of the operations

- ⇨ Preparation of the charge to allow for good circulation of the product. For planed wood, this involves, among other things, stacking on a thin rod.
- ⇨ Complete immersion of the charge for a duration of at least 3 minutes.
- ⇨ Draining for approximately 15 minutes.
- ⇨ Fixing period under cover: minimum 4 hours.

5 - Results

Use classes 1, 2, 3.1
if the treatment product has the necessary qualification.
The performance requirements are defined in chapter 3.

Additional information

- ***Evaporation of solvents***

  - ⇨ artificial drying not recommended
  - ⇨ natural drying from a few days (light solvent and water) to several weeks (heavy solvent). Time frames vary greatly depending on the impregnability of the wood, its mode of storage and weather conditions.

- ***Retreatment of cuts***

In the case of unexpected cuts during implementation, treat these cuts with generous brushing using a product of the same class.

- ***Retreatment of cracks at the treatment facility***

After treatment, during the drying of pieces from a large section, splits may appear. They should be treated by brushing with a product of the same use class.

> ***Remark***
> *In the case of very impregnable wood, bluish, or that has been floated or stored in water, the product may be heavily absorbed in certain areas causing difficulties with drying or stains. This wood should not come into contact with porous materials.*

6 - Certification

To be established in compliance with French Standard NF B 50-105-3.

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4 DIP DIFFUSION

1 - Description of the procedure

Procedure involving the prolonged immersion of green wood in a water-soluble salt-based treatment product, followed by a period of diffusion under cover to ensure the penetration of the product into the wood thanks to the moisture it contains.

2 - Equipment

In compliance with the regulations in force.

- Vat installed in accordance with regulatory requirements, with possibly, a solution preparation tanks and a storage tank.
- System for lowering and keeping the charges immersed.
- Storage hangar (or shelter) for the wood after treatment.

Control equipment

- Densimeter/thermometer
- Hygrometer.
- Chart.

3- Treatment products

Water-soluble salts

The products used must meet the evaluation criteria set out in chapter 3 for the impregnation procedures for the given use class(es). The products used for this mode of application are salts that are slightly fixed or unfixed and thus susceptible to leaching.

The treatment solution is obtained by dissolving a certain amount of the product in water; the concentration of the solution must be stated by the manufacture on the information label. Dissolving may be difficult and require a special installation with a mixer.

During its use, the solution should be controlled at regular intervals by densimetry - this is a method that, by using a graph, makes it possible to determine the concentration of the solution according to the density and temperature of it. If the concentration of the solution changes, it can be adjusted, wither by the addition of water or by adding more of the product. The densimeter and chart should be provided by the manufacturer.

If the treatment solution has accidentally frozen, it should be vigorously stirred before reusing.

4- Treatment process

a) State of the wood

- *Machining*
  The piece should have undergone all machining

- *Moisture*
  Moisture greater than 50%.

b) Descriptions of the operations

- ⇨ Immersion of the charge to be treated for a variable duration according to the nature of the product and/or the thickness of the wood. The durations should be stated by the manufacturer, and should not be less than 8 hours (4 hours for full charges with a thickness of less than 27 mm). In order to limit the subsequent drying speed, use thin rods (less than 10 mm)
- ⇨ Keep the charge under cover, in an atmosphere with little ventilation for at least 10 days to allow completion of the diffusion process. Class 1 products should be kept under cover continuously immediately after treatment.

5 - Results

Use classes 1, 2, 3 according to the characteristics of the product.
The performance requirements are defined in chapter 3.

Additional information

For unfixed products, guard in particular against the risk of leaching, never expose the wood to the weather, even for a short period of time.
Drying the wood after treatment (beyond the 10 days provided for in the procedure): the drying period is the same as for untreated wood, from the same section and same moisture content. Artificial drying, over 40°C, is not recommended.

♦ ***Retreatment of cuts***

In the case of cuts that happen during implementation, treat these cuts with generous brushing using a product of the same use class, according to the criteria defined in chapter 3.

The large cracks that may appear during drying should also be brushed.

6 - Certification

To be established in compliance with French Standard NF B 50-105-3.

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5 DOUBLE VACUUM AUTOCLAVE

1 - Description of the procedure

Wood impregnation procedure in a closed vessel involving application of the vacuum and possibly a limited pressure.

2 - Equipment

In compliance with the regulations in force.

- Autoclave equipped with a system for regulating the duration and intensity of the vacuum and pressure, with recording of the cycle.
- Storage tank for the treatment solution.
- Possibly a preparation tank for the solution.

Inspection equipment

- Hygrometer
- Cycle recording system
- Densimeter/thermometer
- Chart

3- Treatment products

The products used must meet the evaluation criteria set out in chapter 3 - Double vacuum autoclave for the given class(es) In the case of control, these are conducted in accordance with Standard EN 351-2.

Petroleum solvents

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the diluent and the dilution ratio must be specified by the manufacturer on the information label. Given the wide variation of petroleum fractions, the dilution control cannot be carried out by means of a simple procedure, such as measuring the density and viscosity, but requires chemical analysis.

Water-dispersible products

The product is either ready to use, or in a concentrated form for dilution. In the latter case, the dilution ratio must be specified by the manufacturer.

During its use, the solution should be controlled at regular intervals by densimetry - this is a method that uses a chart to determine the concentration of the solution according to the density and temperature of it. If the concentration of the solution changes, it can be adjusted, either by the addition of water, or by adding more of the product. The densimeter and chart should be provided by the manufacturer.

Ensure to thoroughly mix the treatment solution before use.

Avoid exposing the treatment solution to extreme temperatures (risk of freezing or evaporation).

If the treatment solution has accidental frozen (repeated freezing can be detrimental to its performance), ensure to thoroughly mix the solution before using it again and have it analysed by the manufacturer as quickly as possible.

Any mixing of water-dispersible products is prohibited. Indeed, such mixtures can lead to phase imbalance and the control of progressive concentrations can no longer be used to verify the continued efficacy.

However, it may be possible to mix two products made by the same manufacturer on its own responsibility, with the understanding that the controls may find non-compliance of the mixtures:

- ⇨ with certified products in terms of their composition
- ⇨ with information labels in terms of the concentrations for use

Consequently, the manufacture should describe its mixing/substitution procedure to the Mark Committee after the FCBA have verified the compatibility of the two products and that the concentrations corresponding to the thresholds are reached for the intended concentration ranges.

4- Treatment products

a) State of the wood

↳ *Mositure*

Dry wood: moisture less than 25%

b) Descriptions of the operations

- ⇨ Introduction of a charge into the treatment vessel.
- ⇨ Application of a vacuum (initial vacuum).
- ⇨ While maintaining the vacuum, introduction of the product until completely full.
- ⇨ Possible application of pressure on the liquid not exceeding 2 bars[(2)] for a determined time interval before returning to atmospheric pressure.
- ⇨ Return to atmospheric pressure
- ⇨ Draining of the vessel.
- ⇨ Application of final vacuum (drainage vacuum).

c) Treatment cycles

The intensity and duration of the vacuum and pressure phases cannot be determined in advance. They depend on the nature of the wood, its impregnability, its section and the performance level required.
The cycle should be defined according to each individual case.

5 - Results

Use classes 1, 2, 3, if the treatment product has the necessary qualification.
Performance requirements are defined in chapter 3.

Additional information

- ♦ ***Evaporation of solvents***

  - ⇨ artificial drying not recommended at over 40°c.
  - ⇨ natural drying from a few days to a few weeks according to the depth of product impregnation, the nature of the solvents and the weather conditions.

In the case of very impregnable wood that is bluish, has been floated or stored in water, the product may be heavily absorbed in certain areas causing difficulties with drying or stains.

Any finishing or laminating of the wood is not possible, at the risk of poor results, provided that the petroleum solvent introduced by the treatment has not evaporated.

(2) 1 bar = 1.10^5 Pa = 1 atm

In the case where the treatment is applied to a finished structure that has been laminated or contains seals, insulating foam, hardware, etc., make sure the treatment product is compatible with these components

- ***Retreatment of cuts***

In the case of unexpected cuts during implementation, treat these cuts with generous brushing using a product of the same class.

- ***Safety of the procedure***

  - Do not work in temperatures above the flash point of the product.
  - Adjust the drying to prevent efflorescence.

6 - Certification

To be established in compliance with French Standard NF B 50-105-3.

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6. VACUUM PRESSURE AUTOCLAVE

1 - Description of the procedure

Wood impregnation process in an autoclave subjected to vacuum and pressure operations.

A distinction is made between the process referred to as "full cells" (Bethell) and the process referred to as "empty cells" (Rüping).

2 - Equipment

In compliance with the regulations in force.

- Treatment autoclave with a system for regulating the vacuum and pressure. The equipment must allow a pressure of at least 7 bars.
- Storage tank for the treatment product.
- Preparation tank for the treatment solution, if necessary.
- Equipment for measuring the consumption of the treatment product.

In France, wood treatment activities are subject to the regulations of Classified Installations for the Protection of the Environment (ICPE). In particular, they must meet the following requirements:

1. The use of sites must be authorised by prefectoral order.

2. The storage of preservatives, their dissolving or dilution, the treatment of wood and the drying of treated wood, must be carried out under cover, in a watertight area resistant to the products used, constructed so as to allow the collection and recycling of wastewater and leakages, forming a holding capacity at least equal to the biggest of the following two values:

    - 100% of the capacity of the largest tank;
    - 50% of the overall capacity of associated tanks

3. The pipes that the concentrated or dilutes product circulates in must be fixed and placed inside a watertight enclosure. The removal of bulk products or the handling of containers of products during their delivery, as well as the transport of treated wood to the drip-drying area, must be carried out in such a way as to eliminate any risk of pollution.

4. The name of the product and the safety conditions related to its use must be clearly displayed on the installations.

5. All discharge of the effluent containing the treatment product into the natural environment or into a sewage system is prohibited. This effluent must be recycled as much as possible. Effluent that is not recycled must be removed in specialised facilities that have been authorised to do so.

6. There should be a disconnection between the water supply and its use (e.g. backflow preventer at the water meter). The volumes of water consumed should be measured.

7. A piezometer should be installed downstream of the operation to monitor the water quality of the underlying groundwater.

For companies located abroad, they must be in compliance with the regulations in force in their country and must meet, as a minimum, the requirements set out above.

Control equipment (give an indication)

- Densimeter/thermometer or any other device for measuring the concentration of the treatment solution
- Chart

3- Treatment products

Water soluble salts

The products used must meet the evaluation criteria set out in chapter 3 - Autoclave for the given class(es).

The treatment solution is obtained by dissolving a quantity of the product in water. The concentration of the solution must be stated by the manufacturer on the information label. Dissolving may be difficult and require a special installation with a mixer.

During its use, the solution should be controlled at regular intervals by densimetry - this is a method that, by using a graph, makes it possible to determine the concentration of the solution according to the density and temperature of it. If the concentration of the solution changes, it can be adjusted, wither by the addition of water or by adding more of the product. The densimeter and chart should be provided by the manufacturer.

For some products, other techniques may be used.

By-products from the distillation of coal-tar

This concerns creosotes, fluids or heavy, used at temperatures of between 85° and 95°C.

They must meet:

- the evaluation criteria for treatment products (chapter 3)
- the composition criteria for creosotes of type B and C (EN 13991)

This last standard is used to control the receipt of products.

The product is ready to use and does not require any readjustment during its use.

On principle, mixing products is prohibited. It may be permitted if a product is changed for another treatment product from the same supplier and with a similar formulation. In any case, the feasibility must be validated in advance by the person responsible for certification.
In the case of a change of product, the treatment installations should be drained and cleaned.

4- Treatment process

a) State of the wood

↳ *Machining*

The piece should have undergone all machining, except in the case of small pieces (5x5 cm)

↳ *Mositure*

⇨ For products in aqueous solution, moisture should be less than or equal to:
• 25% for classes 3, 4 and 5,
• 40% for classes 1 and 2,

⇨ For creosotes, moisture should be less than 25%.

⇨ In the case of round wood treatment, large splits will appear during drying. To avoid having to treat the splits afterwards, this type of wood should be treated at a moisture level of under 25%.

b) Descriptions of the operations

Full cell process

⇨ Introduction of the charge to be treated into the autoclave.
⇨ Application of a vacuum (initial vacuum).
⇨ Introduction of the treatment product under vacuum and filling of the treatment cylinder.
⇨ Application of pressure on the liquid: minimum 7 bars.
⇨ Reaching the hold time.
⇨ Return to normal pressure.
⇨ Emptying of the cylinder.
⇨ Application of final vacuum (drainage vacuum).

Empty cell process (currently used for creosotes)

⇨ Introduction of the charge to be treated into the autoclave.
⇨ Application of "initial air pressure" on the wood (2 to 4 bars) for approximately 10 mins.

- ⇨ Introduction of the treatment product while holding this pressure and gradually increasing it to 6 to 8 bars
- ⇨ Holding the pressure for 20 to 180 min to obtain saturation. Saturation is characterised by holding the pressure for at least 10 minutes without increasing consumption.
- ⇨ Discharging of the impregnation solution by draining and final vacuum from 25 to 40 min.
- ⇨ Removal of the charge.

c) Treatment cycles

The intensity and duration of the vacuum and pressure phases cannot be determined in advance. They depend on the nature of the wood, its impregnability, its section and the performance level required.
The cycle should be defined according to each individual case.

d) Improvement of the procedures

For species that are difficult to impregnate (fir - spruce - larch - Douglas fir, for example) and for round wood exclusively, the following may be used:

- **Splitting procedure: creating splits.**
  - ⇨ Estrade process
    Before injection, the wood is placed in an oven and exposed to hot, dry air at a temperature of between 80 and 100°C for a minimum duration of 48 hours to obtain maximum splitting. When it comes out of the oven, the wood is immediately introduced into the autoclave to undergo treatment through the "full-cell" process. This procedure is generally reserved for creosote treatments.
  - ⇨ Drying and splitting procedure
    Same process. The period of time in the oven should not be less than 15 hours.

- **Perforation/incising procedure**: increases the penetration of the treatment product.

e) Availability time frame

Leave the wood to dry for 2 to 8 days before making it available.

5 - Results

Use classes (if the product is of the required quality):

Impregnable species 1-2-3-4-5
Species that are barely or not impregnable 1-2-3-4

For species that are barely or not impregnable, class 4 can only be obtained by means of a procedure improvement feasibility study.

.
Performance requirements are defined in chapter 3.

Additional information

- Drying of wood treated with aqueous-based products: several weeks, but artificial drying (less than 40°C) may be possible.

- Dry wood treated with salts - case of laminated timber - may be laminated or painted in some cases subject to light planing of the surface.

- Risk of exudation of wood treated with creosotes: no laminating or finishing is possible.

- The wood is machined prior to treatment, but light surface machining may be permitted afterwards, as well as cross-sectional cuts for some uses - cutting horizontal or vertical pieces to length - but the cut area must remain above ground. The cuts should therefore receive a repeat treatment:

  - for aqueous solutions, on pieces that have resumed a dry moisture level in the air, generous brushing with a class 3 product;
  - for creosotes, generous brushing with a creosote fluid just after cutting.

- Retreatment of splits at the treatment facility: after treatment, during the drying of pieces from a large section, splits may appear. They should be treated by brushing with a product of the same use class.

6 - Certification

To be established in compliance with French Standard NF B 50-1053.

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7 HOT COLD DIPPING

The hot and cold procedure is a variant of the dip-diffusion process, in that it meets the requirements of classes 1, 2, 3.1 according to the product characteristics.

It has expanded to the treatment of woodwork due to the small sections used and because it is followed by finishing which, together with treatment, offers a specific protection system, that is subject to specific verifications.

This procedure recognised in the flooring industry in particular, and in industrial joinery. Feasibility as described in Article 5 is established.

1 - Description of the procedure

Impregnation procedure that involves pre-heating the wood before immersion in a cold aqueous solution of water-soluble salts.

2 - Equipment

In compliance with the regulations in force.

- Vessel with drainage system including one that can be heated (or closed steam chamber)
- Storage tank, possibly preparation tank for the treatment solution.
- System for lowering and keeping the charges immersed in the vessel.
- Storage hangar (or shelter) for the wood after treatment.

Control equipment

- Densimeter, thermometer.
- Graph.

3- Treatment products

Water soluble salts

The product used must meet the evaluation criteria set out in chapter 3 for the impregnation procedures for the given use class(es). The products used for this mode of application are salts that are slightly fixed or unfixed and thus susceptible to leaching.

The treatment solution is obtained by dissolving a certain amount of the product in water; the concentration of the solution must be stated by the manufacture on the information label. Dissolving may be difficult and require a special installation with a mixer.

During its use, the solution should be controlled at regular intervals using a densimeter in order to determine its concentration. If the concentration of the solution changes, it can be adjusted, wither by the addition of water or by adding more of the product. The graph should be provided by the manufacturer.

4- Treatment process

a) State of the wood

- *Machining*
  The procedure is applied to wood before final machining.

- *Moisture*
  Moisture greater than 50%.

b) Descriptions of the operations

- ⇨ The charge to be treated is pre-heated in a bain-marie (hot water) or using steam to a temperature of 80°C for between 1 hour 30 minutes and 2 hours.
- ⇨ Very soon after coming out of the first chamber, the pre-heated wood is immersed in the vessel containing the treatment solution and maintained at 20°C for at least 30 minutes (calculated from the moment the wood is submerged).
- ⇨ Draining the wood.
- ⇨ Keeping wood under cover to dry naturally.

5 - Results

Use classes 1, 2, 3
if the treatment product has the necessary qualification.
The performance requirements are defined in chapter 3 of the technical specifications.

Additional information

- Wood drying: several days
- In the case of unexpected cuts during implementation, treat these cuts with generous brushing using a product of the same use class.
- For certain specific cases - windows in oak, plywood and finger-jointed - this procedure could be used, but it must have undergone a preliminary study.

6 - Certification

To be established in compliance with French Standard NF B 50-1053.

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8 OTHER PROCEDURES

In accordance with Article 4 of the CTB-P+ Technical Regulations, procedures other than those described from 1 to 7 should include:

- ***a description***
- ***a feasibility study.***

The description of a procedure must be made according to the following plan:

1 Procedure/aim

2 Equipment (outline). Remember that the installations are classified.

3 Products

- Brief description
- Type of fixation in the wood

4 Treatment procedure

- Machining
- Moisture before
- Precautions after

5 Result/efficacy of the treatment (product/procedure combination)

6 Attestation/certification/marking

- Standard/Information label
- Types of marking, logos
- Critical value
- Other documents

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Chapter 3

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DURABILITY CONFERRED: Rules concerning the application and interpretation of the standards

3.1 - Preventive treatment products

Scope

The technical specifications apply to wood treatment products applicable in liquid form for the preventive treatment of deterioration of biological origin listed in EN 335. Encapsulated formulations, or in paste, solid or gas form, are subject to feasibility studies and special procedures.

3.1.1 - Treatment specifications – Requirements for penetration and retention by use class

- These concern the application of treatment products, characterised by their critical value, to wood.

RETENTION = Quantities of preservative in the analytical zone. This is expressed in g/m^2 for surface treatment products and in kg/m^3 for deep impregnation products.

- It should be noted that
  - for an equivalent procedure, the critical value may cause the use concentration to vary: in class 4, the concentrations should be adjusted
  - for an equivalent product, the critical value and the specifications will have the effect of changing the penetration/retention requirement.

- In addition, in compliance with EN 351, the samples of treated wood should be statistically significant and representative of the batches analysed.

- No result should be equal to zero (which would mean either an absence of treatment, or absence of retreatment of cuts).

- These provisions indicate the need for a systematic adaptation of the procedures and use doses:
  - to the operational conditions resulting from the initial audit
  - to the consolidation of quality assurance procedures
  - to the corrective measures during the control audits.

- In the case of preventive treatment by short dipping, the CTB-P+ certified concentrated treatment products should be diluted to a critical value divided by 100 for the wood use class.

For owners of the right to use the CTB-B+ Mark or equivalent certification, the dilution ration of the product may be adjusted according to the actual retentions measured by the company.

- Concerning use class 3.1, the adjustment factor is equal to 0.5 irrespective of the treatment procedure.

- For organic-copper type formulations, 2 critical values are defined according to objectives of the service life to be reached:
  - class 4 (SP): service life of 10-15 years
  - class 4 (SP): service life > 25 years. For structures or special circumstances that require greater protection.

The distinction between class 4 and class 4 (SP) should be clearly stated on the treatment labels and certificates.

For the treatment of vineyard posts and arboriculture, retention must be retention class 4 (SP) in order to receive CTB-B+ certification, unless it is clearly stipulated on the commercial documentation pertaining to the certification that the expected service life does not exceed 15 years. In this case, the wood may be treated at retention class 4.

Table of treatment specifications for tropical regions:

Information note for the attention of project managers: weather conditions often result in changes to wood use classes in the field of construction, between mainland France and tropical regions.

TABLE OF THE TREATMENT SPECIFICATIONS APPLICABLE TO MAINLAND FRANCE

CLASS	IMPREGNABLE SPECIES			RESISTENT SPECIES			RETENTION REQUIREMENTS		
	Penetration level		Analytical zone	Penetration level		Analytical zone	Retention objective	Compliance analysis	
								Critical value taken into account	Percentage to be reached
1	NP1	No requirement but all sides treated	3mm	NP1	No requirement but all sides treated	3 mm	Critical value Class 1	Class 1 Insects	50% of the class 1 critical value
2	NP1	No requirement but all sides treated	3mm	NP1	No requirement but all sides treated	3 mm	Critical value Class 2	Class 2 All agents	50% of the class 2 critical value
3.1	NP3 [b]	6mm	6mm	NP1	No requirement but all sides treated	3 mm	Class 3 critical value	Class 3 All agents	50% of the class 3 critical value
3.2 [a]	NP5 [b]	Full sapwood	Full sapwood [c]	NP3 [b]	Lateral: 6 mm	6 mm	Critical value Class 3	Class 3 All agents	100% of the class 3 critical value
4 [a]	NP5 [b]	Full sapwood all sides treated	Full sapwood [c]	NP4 [b] ***	Lateral: 25 mm	25 mm	Critical value Class 4	Class 4 All agents	100% of the class 4 critical value
				(on round wood only)					
5 [a]	NP6 [b]	100% sapwood and 6 mm into exposed heartwood	Full sapwood [c]	Non compatible species			Critical value Class 5	Class 5 All agents	100 % of the class 5 critical value

a for technical reasons, from class 3.2 inclusive, the specifications can only be met by impregnation treatment procedures. For classes 1,2 and 3.1, performances are usually reached by surface treatment procedures.

b in the case a treatment compliance audit, the pieces of wood should include significant sapwood zones for the wood and wood-based materials where the sapwood and heartwood can be clearly distinguished.

c for wood-based panels, full sapwood is defined as all the volume.

*** for these species, penetration requires prior and appropriate preparation of the wood, such as incising or mechanical perforation.

TABLE OF THE TREATMENT SPECIFICATIONS APPLICABLE TO FRENCH OVERSEAS DEPARTMENTS

CLASS	IMPREGNABLE SPECIES			RESISTENT SPECIES			RETENTION REQUIREMENTS		
	Penetration level		Analytical zone	Penetration level		Analytical zone	Retention objective	Compliance analysis: Critical value taken into account	Compliance analysis: Percentage to be reached
1	**Use class 1 in has no justification in French overseas departments**								
2	NP1	No requirement but all sides treated	3mm	NP1	No requirement but all sides treated	3 mm	Critical value Class 2	Class 2 All agents	100 % of the class 2 critical value
3.1	NP5 [b]	Full sapwood	Full sapwood [c]	NP1	No requirement but all sides treated	3 mm	Class 3 critical value	Class 3 All agents	100 % of the class 3 critical value
3.2 [a]	NP5 [b]	Full sapwood	Full sapwood [c]	NP3 [b]	Lateral: 6 mm	6 mm	Critical value Class 3	Class 3 All agents	100 % of the class 3 critical value
4 [a]	NP5 [b]	Full sapwood all sides treated	Full sapwood [c]	NP4 [b] *** (on round wood only)	Lateral: 25 mm	25 mm	Critical value Class 4	Class 4 All agents	100 % of the class 4 critical value
5 [a]	NP6 [b]	100% sapwood and 6 mm into exposed heartwood	Full sapwood [c]	Impossible Non compatible species			Critical value Class 5	Class 5 All agents	100 % of the class 5 critical value

a for technical reasons, from class 3.2 inclusive, the specifications can only be met by impregnation treatment procedures. For classes 1,2 and 3.1, performances are usually reached by surface treatment procedures.

b in the case a treatment compliance audit, the pieces of wood should include significant sapwood zones for the wood and wood-based materials where the sapwood and heartwood can be clearly distinguished.

c for wood-based panels, full sapwood is defined as all the volume.

*** for these species, penetration requires prior and appropriate preparation of the wood, such as incising or mechanical perforation.