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EUROPEAN CHEMICALS AGENCY

SUPERSEDED GUIDANCE - NEWER VERSION AVAILABLE

Transitional Guidance on the Biocidal Products Regulation

Transitional Guidance on Efficacy Assessment for Product Type 8 Wood Preservatives

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TRANSITIONAL GUIDANCE

LEGAL NOTICE

Transitional Guidance on Efficacy Assessment for Product Type 8 Wood Preservatives

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PREFACE

This Transitional Guidance is to be applied to applications for active substance approval and product authorisation submitted under the Biocidal Product Regulation (EU) No 528/2012 (the BPR). This document describes the BPR obligations and how to fulfil them

This Guidance replaces the Technical Notes for Guidance (TNsG) on Data Requirements (EU, 2008a) in support of Directive 98/8/EC (Biocidal Product Directive - BPD).

A "Transitional Guidance" is a document that has been initiated under the "old" Biocidal Products Directive 98/8/EC and because it has been finalised before the relevant new BPR guidance document has been fully developed, it is being made available as a Transitional Guidance document until such time as the relevant new document is ready for publication.

This Transitional Guidance document has had a Public Consultation by the Commission and this document is now finalised and waiting for inclusion into Volume II Part B of the new BPR guidance structure: there will be no further consultation on this document and it will be added by a corrigendum when the relevant Volume is available.

This is a Transitional Guidance to support chapter 7 from TNsG on product evaluation for Product Type 8 Wood Preservatives

NOTE to the reader:

This Transitional Guidance will be reformatted when it is incorporated into the New Guidance Structure. When this is completed, the finalised version will be uploaded onto the website of ECHA. No consultation will be made to do this

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General Introduction

This document deals with the evaluation methodology of efficacy tests for wood preservatives biocidal products that are applicable in the frame of the EU Biocidal Products Regulations (BPR) for the authorisation of biocidal products (BPR Annex VI).

The document is not intended to replace standards, standardized methods or other methods used as reference for developing the required data. It is considered as scientific guidance and the reader is advised to refer to the standards themselves or appropriate literature in case details should require further clarification.

The aim of this document is to provide a common base for the assessment of the efficacy for the biocidal product authorization for PT8 products for the applicants and the Competent Authorities (CAs).

Although alternative test methods could be taken into account, this document is mainly based on the EN 599-1 standard for preventive uses and on the EN 14128 standard for curative uses.

This document covers the products used for the preventive treatments of wood (including the saw-mill stage), by the control of wood-destroying or wood-disfiguring organisms (temporary treatments of logs in the sawmill or log yards, temporary treatments of green sawn timber, treatments of sawn timber including round timber, treatments of wood based panel) and products used for the curative treatments of sawn timber in service.

For product already on the market before entering into force of the standards (in 1990 for EN 599 and in 2004 for EN 14128):

- Efficacy data on the product should be provided.
- The assessment of the product efficacy should be based on expert judgement;
- Some data taken from the literature or used in certification could be accepted on case by case basis.

When the data are not enough robust to demonstrate the efficacy of the product, new tests according to EN 599 and/or EN 14128 will be required.

At the review time of this document, it has been chosen to include the catalogue of uses in the chapter 7 of the technical notes for guidance on product evaluation (PT8). The inclusion of the catalogue of uses to this document is to provide a common basis to harmonize the claims of the product. It will facilitate in a second time the mutual recognition by listing the elements of the claim in the same order and using the same terminology. On the label, the categories related to the product should be presented as described in the following paragraphs. The codes increase the readability of this document and are not expected on the label.

Concerning the updating of this document, it should be considered as a living document and will be reviewed on a regular basis and updated if necessary, under ECHA’s procedures.

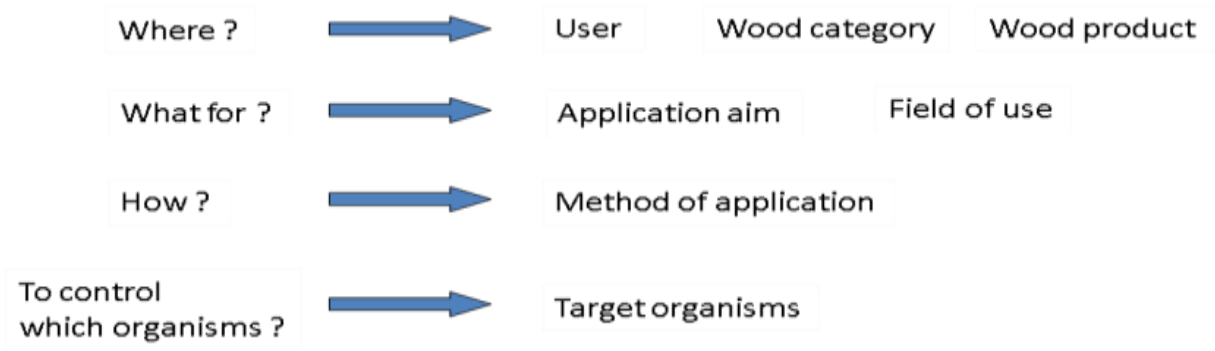
The tests should be performed according to the current version in force of this document. Any tests initiated before the endorsement of the new version remain acceptable.

1. Label claims

In order to harmonize the efficacy issues, it is proposed that the different uses of the product are presented following the proposal below. This should follow the order of the categories listed below.

The aim of this categorisation is to have an explicit answer on the following questions:

- Where is the product used?
- What is the product used for?
- How is the product used? To control which organisms?



The data which support the efficacy should also follow this format.

The main categories that should be present on the label are listed in Table 1**Error! Reference source not found.**, and are detailed in the following paragraphs.

Table 1: Different categories and the related product codes

Categories	Code for product
User category	A.xx
Wood category	B.xx
Wood product	C.xx
Application aim & Field of use	D.xx & E.xx
Method of application and rate	F.xx
Target organisms	G.xx

1.1 User Category (Code for Product A.xx)

Information on the intended users of the product has to be presented on the label, the different user categories are presented in Table 2.

Table 2: User categories

User Category	Example	Product Code
Non-professional/general public	Product used at home by consumers	A.10
Industrial	Industrial applicator	A.20
Professional	Pest control operator	A.30

1.2 Wood Category (Code for product B.xx)

This chapter deals with the wood category and not the use classes as defined in EN 335 standard. From an efficacy point of view, in EN 599-1, annex D the wood timbers are divided into two categories: softwood and hardwood.

Softwood and hardwood species of timber react differently to the degree and the type of attack by certain biological agents.

In most cases, the tests are performed with softwood. In some cases it is acceptable for this data to be read across to hardwoods, but in other cases specific testing against hardwoods is required. (see EN 599-1)

Table 3: Wood categories

Wood Category	Product Code
Softwood	B.10
Hardwood	B.20

1.3 Wood Product (Code for product C.xx)

Table 4 below describes the types of wood products that are used as building materials or in the manufacture of furniture. Wood products are divided in two main categories: solid wood and wood based panels. Based on European standards, wood based panels are divided in four categories: plywood (EN 636), OSB (EN 300), Particles (EN 309 & EN 312) and Fibers (EN 622).

Table 4: Wood product categories

Wood Category	Product Code
Solid wood	C.10
Reconstituted solid wood *Engineered solid wood products produced by processes involving pressure, adhesives and binders*	C.11
Panels	C.20

Plywood panels	C.21
OSB panels	C.22
Particles panels	C.23
Fibers panels	C.24

1.4 Application aim and field of use

1.4.1 Application aim (code for product D.xx)

A preventive treatment is used to prevent sound wood from being infected by wood destroying agents and/or disfiguring fungi. The curative treatment is used to kill infective organisms that have already attacked the wood, to prevent them from spreading in the rest of the wood.

The preventive treatments are most of the time used during the manufacturing process but can also be done when the wood is in its service situation (e.g. framework of the building, a bridge.).

According to the fact that a product can be used in wood preventive treatments, in curative treatments and sometimes both, and according to the fact that wood preservative and curative treatments are not covered by the same treatments, it is proposed to split the application aims as presented in Table 5.

The aim of this classification is to ensure having the same classification throughout the EU.

Table 5: Application aim

Application Aim	Kind of Treatment	Product Code
Preventive	Temporary preventive treatment / logs	D.10
	Temporary preventive treatment / green sawn timber	D.20
	Preventive treatment / blue stain in service	D.30
	Preventive treatment-use class (cf. the following chapter for the field of use – code E)	D.40
Curative	Curative treatment / wood in service	D.50
Preventive	Other (for e.g. pole maintenance)	D.60

1.4.2 Field Of uses (Code For Product E.xx)

The use classes described in EN 335:2013 are defined in terms of service conditions, with reference to the generalised moisture content and the prevailing biological agents of deterioration. The different classes (and their related application codes) are presented in Table 6.

- Use class 1: situation in which the wood or wood based product is inside a construction, not exposed to the weather and wetting;
- Use class 2: situation in which the wood or wood-based product is under cover and not exposed to the weather (particularly rain and driven rain) but where occasional, but not persistent, wetting can occur;
- Use class 3: situation in which the wood or wood-based product is above ground and exposed to the weather (particularly rain);
- Use class 4: situation in which the wood or wood-based product is in direct contact with ground or fresh water;
- Use class 5: situation in which the wood or wood based product is permanently or regularly submerged in salt water (i.e. sea water and brackish water).

Use class 3 is split into two sub-classes:

- 3.1: wood and wood based products will not remain wet for long periods. Water will not accumulate;
- 3.2: wood and wood-based products will remain wet for long periods. Water may accumulate.

The use classes 4.1 and 4.2 described in the former version of the EN 335 standard (2009) have been merged into a single use class 4, including both wood in exterior, in ground and/or fresh water contact.

Table 6: Different field of uses

Field of Uses	Product Code
Use class 1	E.10
Use class 2	E.20
Use class 3*	E30
Use class 3.1	E.31
Use class 3.2	E.32
Use class 4	E.40
Use class 5	E.50

* includes use class 3.1 and use class 3.2

1.5 Method of application and application rate (Code for product F.xx):

The various methods available can be broadly split into three groups:

- **Superficial treatments**

  Such non-pressure processes include brush, spray, roller, pad application and immersion (dipping) processes (where the wood can be in contact for preservative for periods of time ranging from a few minutes to several hours). The application rates are commonly expressed in g/m^2, ml/m^2.

- **Penetrating treatments**

Such processes include the vacuum pressure, alternating oscillating pressure, double vacuum and non-pressure processes such as diffusion treatments. The application rates are commonly expressed in kg/m^3.

- **Other treatment methods**

For application methods different from those described above (fumigation, injection), either specifically relevant data or some justification for non-inclusion of data (i.e. details on penetrability/retention, etc.) will need to be provided to the CA for consideration.

Some PT 8 products are designed to be used with a top coat, e.g. primers for window framing. If a top coat is needed according to the manufacturer, this must be applied with the product. When a more general use is envisaged, generic coating materials can be used according to the norms performed.

Table 7: Method of application

Method of application	Product Code
Superficial application / brush/roller/pad treatment	F.10
Superficial application / spray treatment	F.11
Superficial application / flow coat /aspersion	F.12
Superficial application / foam treatment	F.13
Superficial application / dipping treatment	F.14
Injection	F.20
Pressure process	F.30
Pressure process / vacuum pressure impregnation	F.31
Pressure process / double vacuum	F.32
Fumigation	F.40
Fumigation bubble	F.41
Pole in services fumigation	F.42
Mixing with glue and mortar	F.50
Diffusion	F.60
Solid pellets / rods	F.61
Pole bandage / wrapping / pad application	F.62
Other application methods	F.70

1.6 Target organisms (Code for product G.xx)

This section describes the main categories of target organisms, in relation to the claimed uses of the product, either for treatments to prevent biological attack, or for curative treatments to disinfest or to eradicate existing attack.

Appendix 1 gives more information on the principle target organisms.

There are a number of possible effects on target organisms resulting from the proposed use of a wood preservative product. The efficacy data for a wood preservative must be suitable to demonstrate the efficacy of products applied as either pre-treatments to prevent biological attack, or as curative treatments to disinfest or to eradicate existing attack. These may be in a variety of forms; they may yield toxic values, mortality values, subjectively derived ratings or effective retention values.

On the claimed matrix, the target organisms against which an efficacy is claimed must be clearly described. For the purpose of harmonisation, it is proposed that the target organism presented in Table 8 should be used, although these should not be considered as an exhaustive list. The species presented below are the species being representative of wood attacking organisms. For specific claims, efficacy data against each named target pest will be required.

Table 8: Examples of target organisms for wood preservatives (N.B. these examples are not intended to be exhaustive with respect to target organisms or prescriptive with respect to data to be generated).

Target organisms				
Common English term	Code F forproduct	Target organisms according to EN 1001	Classification	Scientific name
Fungi			Fungi	
Wood rotting fungi				
Wood rotting basidiomycetes	G.10	Brown rot fungi	Basidiomycetes	e.g. *Gloeophyllum trabeum*
	G.11	White rot fungi	Basidiomycetes	e.g. *Coriolus versicolor*
Soft rot fungi	G.12	Soft rot fungi	Ascomycetes, Deuteromycetes	e.g. *Chaetomium globosum*
Wood discolouring fungi	G.21.1	Sapstain fungi (bluestain mainly)	Ascomycetes, Deuteromycetes	e.g. *Ophiostoma piliferum (Ceratocystis pilifera)*
	G.21.2	Bluestain in service	Ascomycetes, Deuteromytcetes	e.g. *Aureobasidium pullulans*
	G.22	Mould fungi	Ascomycetes, Deuteromycetes,	e.g. *Aspergilus niger*
Insects			Insecta	
Beetles	G.30	Wood boring beetles	Coleoptera	
	G.31	House longhorn beetle		e.g. *Hylotrupes bajulus.*
	G.32	Common furniture beetle		e.g. *Anobium punctatum*
	G.33	Powder post beetles		e.g. *Lyctus brunneus*
	G.40	Fresh wood insect	Coleoptera	e.g. *Scolytus spp*
Termites	G.50	Termites (genus claimed)	Isoptera	
	G.51	Subterranean termites (genus claimed)		e.g. *Reticulitermes spp,* e.g. *Coptotermes spp*
	G.52	Drywood termites (genus claimed)		e.g. *Cryptotermes spp*
	G.53	Tree termites (genus claimed)		e.g. *Nasutitermes spp*
Wood destroying marine organisms	G.60	Marine borers (genus claimed)		
	G.61	Mussels	*Teneridae, Pholadidae*	e.g. *Toredo sp, Martesia sp*
	G.62	Crustaceans	*Isopoda, Amphipoda*	e.g. *Limnoria spp, Chelura spp*

1.7 Examples of a claimed matrix

To illustrate the previous sections described, the following table gives an example of claimed matrix based on the categories from the catalogue of uses. This framework should be followed for the efficacy claim's part of the label. Only the categories and the matrix wordings (not the code) are expected to be listed on the label.

This matrix allows a harmonisation of the efficacy elements presented in the dossier for product authorization. Elements in the claimed matrix must be present on the physical label.

Table 9: Examples of claim matrix based on the application codes for product

Label 1:

Categories	Matrix Wording	Code for Product
User category	Industrial	A.20
Wood category	softwood and hardwood	B.10; B.20
Wood product	solid wood	C.10
Application aim and field of use	preventive treatment - use class 3.2	D.40; E.32
Method of application and rate	superficial application/dipping treatment application rate: 100 g/m² in the analytical zone a top coat must be applied. pressure process/vacuum impregnation application rate: 50 kg/m³ in the analytical zone	F.14 F.31
Target organisms	wood boring beetles	G.30
	termites (genus *Reticulitermes*)	G40
	brown rot fungi	G.10
	white rot fungi	G.11

Label 2:

Categories	Matrix Wording	Code for Product
User category	Industrial	A.20
Wood category	softwood and hardwood	B.10; B.20.
Wood product	solid wood	C.10
Application aim	preventive treatment - use classes 2, 3	D.40 - E.20; E.30;

Categories	Matrix Wording	Code for Product
and field of use	and 4	E.40
Method of application and rate	superficial application/dipping treatment application rate in the analytical zone: UC 2: 80 - 120 g/m² UC3 (coated): 100 – 160 g/m^2 pressure process/vacuum pressure impregnation application rate in the analytical zone: UC2: 30 kg/m^3 UC3: 40 - 70 kg/m^3 UC4 (softwood): 80 – 150 kg/m^3 UC4 (hardwood): 100 – 150 kg/m^3	F.14 F.31
Target organisms	brown rot fungi	G.10
	white rot fungi	G.11
	soft rot fungi	G.12
	wood boring beetles	G.30
	termites (genus *Reticulitermes*)	G.40

Label 3:

Categories	Matrix Wording	Code for Product
User category	Industrial	A.20
Wood category	softwood	B.10.
Wood product	solid wood	C.10
Application aim and field of use	temporary preventive treatment - use class 1	D.20 E.10
Method of application and rate	superficial application / dipping treatment application rate 100 g/m² in the analytical zone	F.14
Target organisms	sapstain	G.21.1
	mould fungi	G.22

2. Available data

2.1 Standard test mthods

When considering the overall evaluation of proposed claims, CAs should ensure that the test methods (data, method of application and application/dose rates used in the tests, product tested) are appropriate to demonstrate the efficacy claimed on the label for the product.

Many standard protocols currently exist to test wood preservatives (see Appendix 2). For PT8, the CEN standards are highly recommended.

Two main categories of treatment are described:

- Preventive treatments, which are covered by EN 599-1;
- Curative treatments, which are covered by EN 14128.

Some other treatments (C.20: green sawn timber) are covered by other standards (e.g. CEN TS 15082).

It is highly recommended to perform the studies according to these standards. If the standards are not applicable or suitable, the applicant may adapt the methodology or use another method (including his own method). When a standard is modified or when a non CEN standard is used, a robust justification and description have to be provided. The study submitted has to provide a clear answer to the issue.

In the general part of the TNsG on data requirements it is mentioned that the test (and the data generated) should be based on sound scientific principles and practices. Compliance with quality standards is highly recommended.

In the TNsG on product evaluation, it is mentioned that for efficacy testing, the principles of Good Laboratory Practice (GLP) are not required by the legislation. However this guidance indicates that the spirit of such principles should be applied for the testing of efficacy.

Particular attention should be paid to:

- what information is needed to substantiate a 'claim matrix';
- the Quality Assurance procedures which should be adopted (cf. ISO 17025 for testing and certification);
- the overall evaluation of the data package when the completeness and adequacy of the data are compared with the label claim.

For products intended for application as solids, pastes or encapsulated forms and those intended for curative (in-situ) use, modification of the relevant protocols/testing strategies may be done or other direct evidence may be submitted on their potential efficacy against the claimed target organisms (e.g. for pastes such evidence could be in the form of penetrability and retention characteristics).

The test methods used to provide data should be relevant to the target organisms and application processes claimed on the label (see EN 599-1 and individual test standards).

It has to be noted that in some cases, a different formulation from which an authorization is sought could be tested. The results could be accepted by the RMS in a case by case approach (see section 3 of this guidance and Annex A of the EN 599-1 and EN 14128). A full composition of the tested product and a robust justification why the test is relevant should be provided.

For EN113, where the protocol states that several organisms have to be tested in order to fulfil the efficacy criteria, it is recommended that all testing is done in the same laboratory at the same time. The sponsor shall have the right to provide his rational for justification why the simultaneous testing may have not been followed. Derogation (inter alia) is acceptable i.e. in the following cases:

- where the test was performed with limited organisms and later completed with additional organisms which could be tested in another laboratory (extension of claim);
- where the laboratory cannot run the test with specific targets;
- where the laboratory has ceased to provide services;
- in the case where a 'simultaneous test' is not available, but valid tests (according to the criteria in the standard) are available.

Table 10 and Table 11 **Error! Reference source not found.**below are informative for the test methods used. The user should also refer to EN 599-1 or EN 14128 depending on the claims.

Table 10: Preventive treatments: List of available standards and others methods used in wood preservation

Organisms	Code for product	Temporary treatment of logs	Temporary treatment	Treatment of solid wood (List of standards mentioned in the tables 1 to 5 of EN 599-1) Note 1: In some conditions, ageing tests (EN 84, EN 73) or natural weathering are required (see EN 599-1) Note 2: It is highly recommended to refer to EN 599-1 to determine the tests to be done in accordance with table 1 to 5 of EN 599-1					Treatment of wood based panels[1]
				Use Class 1	Use Class 2	Use Class 3	Use Class 4	Use Class 5	
Brown rot fungi	G.10				EN 113	EN 113 EN 839 EN 330	EN 113 EN 252	EN113	ENV 12038
White rot fungi	G.11					EN 113 EN 839 EN 330	EN 113 EN 252	EN113	ENV 12038
Soft rot fungi	G.12						ENV 807 EN 252	ENV 807	
Sapstain fungi	G.21.1	No CEN standard*	No CEN standard*						
Bluestain fungi	G.21.2		No CEN standard*		EN 152	EN 152	EN 152	EN 152	
Mould fungi	G.22		No CEN standard*			No CEN standard			
Wood boring beetles	G.30			EN 46 EN 47 EN 49-1	EN 46 EN 47 EN 49-1	EN 46 EN 47 EN 49-1	EN 47 EN 49-2 EN 20-2	EN 47 EN 49-2 EN 20-2	

[1] For wood based panels, the reader is aware that standards can be adapted in specific cases (e.g. CEN/TS 15083-2 for soft rot fungi, EN 20-2 for powder post-beetle and EN 117 and EN 118 for termites)

Organisms	Code for product	Temporary treatment of logs	Temporary treatment	Treatment of solid wood (List of standards mentioned in the tables 1 to 5 of EN 599-1) Note 1: In some conditions, ageing tests (EN 84, EN 73) or natural weathering are required (see EN 599-1) Note 2: It is highly recommended to refer to EN 599-1 to determine the tests to be done in accordance with table 1 to 5 of EN 599-1					Treatment of wood based panels[1]
				Use Class 1	Use Class 2	Use Class 3	Use Class 4	Use Class 5	
				EN 49-2 EN 20-1 EN 20-2	EN 49-2 EN 20-1 EN 20-2	EN 49-2 EN 20-1 EN 20-2			
House longhorn beetle	G.31			EN 46 EN 47	EN 46 EN 47	EN 46 EN 47	EN 47	EN 47	
Common furniture beetle	G.32			EN 49-1 EN 49-2	EN 49-1 EN 49-2	EN 49-1 EN 49-2	EN 49-2	EN 49-2	
Powder post-beetle	G.33			EN 20-1 EN 20-2	EN 20-1 EN 20-2	EN 20-1 EN 20-2	EN 20-2	EN 20-2	
Fresh wood insect	G.40	No CEN standard*							
Termites	G.50			EN 118 EN 117	EN 118 EN 117	EN 118 EN 117	EN 117 EN 252	EN 117	
Marine borers	G.60							EN 275	

Blank cell: Not applicable;

* National standards available (Appendix 2)

Table 11: Curative treatments: List of available standards used in wood curative treatments (based on EN 14128)

Organisms	Code for Product	Curative treatment
Brown rot fungi	G.10	
White rot fungi	G.11	
Soft rot fungi	G.12	
Dry rot fungi	G.13	ENV 12404
Sapstain fungi	G.21.1	
Blue stain fungi	G.21.2	
Mould fungi	G.22	
Wood boring beetles	G.30	
House longhorn beetle	G.31	ENV 1390
Common furniture beetle	G.32	EN 48 or EN 370
Powder post beetles	G.33	No CEN standard available
Fresh wood insect	G.40	
Termites (genus claimed)	G.50	No CEN standard available
Marine borers (genus claimed)	G.60	
Brown rot fungi	G.10	
White rot fungi	G.11	
Soft rot fungi	G.12	
Dry rot fungi	G.13	ENV 12404

Blank cell: Not applicable

2.2 Preventive treatments

Most of the available data are laboratory generated and related to the organisms for which biocidal efficacy is claimed.

Field tests, although desirable in cases where the product is intended for use in the more severe service environments (e.g. in ground contact (use class 3, 4 and 5)) are considered mandatory to fulfil the minimum performance criteria, according to the tests required in the paragraphs related to the use classes As this could lead to a significant delay before a new product could be introduced to the market, literature, monitoring or other methods provided to support the derived application rate could be accepted in case by case by the CAs (see also notes in 2.2.2.3 and 2.2.2.4).

The assessment of the preventive efficacy of wood preservative formulations has to be made from values derived from a relevant biological test. These values are either the actual quantitative amounts of the product established in the test as causing the appropriate level of mortality of the target organism, or they represent the threshold limits, the so-called 'toxic values'. These toxic values are two concentrations in the series

used in the test, the first which just permitts continued attack and the second which just prevents it.

2.2.1 Temporary treatments of logs (in the sawmill or in storage area)

This kind of treatment is used to prevent the degradation of logs which do not immediately have their bark removed. Indeed, some microscopic fungi (e.g. stain) infect the wood and/or some species of insects belonging to the family of *Scolytidae* and *Bostrychidae* (named "Fresh wood insect" in Table 8) lay their eggs between the bark and the wood.

To prevent these damages, the logs may be treated with a biocidal product.

As the treatment is temporary, use class is not relevant in this case.

2.2.2 Temporary treatment of green timber

This kind of treatment is used for the protection of freshly felled green lumber against colonization by blue stain and other discolouring micro-organisms (often named 'sapstain' as there are more than 200 fungi which can caused discoloration of the sapwood) and surface mould.

A technical specification (CEN/TS 15082) is available.

1 blue stain fungi and other discolouring sapwood fungi

   Blue stain is caused by microscopic fungi that only infect the sapwood. They can cause blue or grey discoloration of the sapwood, but have no impact on its strength. Blue stain reduces the value of the wood.

   Typical blue stain fungi are: *Ceratocystis spp, Ophiostoma spp Aureobasidium spp*

   Typical other discolouring fungi are: *Stereum spp*

   In the final stage of processing in a sawmill, treatment with a biocidal product (commonly applied by dipping to prevent blue stain fungi) may be carried out.

2 moulds growing often on the wood surface

   The major problems caused by moulds fungi are discoloration on surfaces, and sometimes health problems. They do not affect the strength properties of wood.

   Typical mould fungal genera on wood are: *Alternaria, Aspergillus, Penicillium, Trichoderma*.

   A dose rate / dipping time is part of the efficacy assessment. The label claim must mention the dose rate and the dipping time.

   As the treatment is temporary, use class is not relevant in this case (see example of labels 3 and 4).

2.2.3 Treatments of solid wood (EN 599-1 Standard)

When the purpose is to protect the wood, a preventive treatment is often applied to prevent the degradation of wood by micro-organisms (for example fungi) and/or by insects (for example wood boring insects). The treatment type is related to the organisms against which the wood has to be protected and to the use class. EN 599-1 specifies what test should be done for each use class claimed.

Different target organisms may preferentially attack either softwood or hardwood. Tests must be conducted on softwood and/or on hardwood as appropriate to the target organisms and following the requirements presented in the relevant test procedures.

It shall be noted that Use Class 1 requires only insecticide products and, starting from Use Class 2, products are fungicide alone or combine fungicide and insecticide activities.

2.2.3.1 Use Class 1

Required data

Refer to EN 599 -1: table 1.

Data will include suitable laboratory data using treated test blocks to determine the toxic values against insects as appropriate.

Data should be presented on test blocks subjected to pre-conditioning by an evaporative ageing process (e.g. EN 73).

Test species

The insect species tested will depend on whether a general or a specific efficacy claim is made. Data should demonstrate activity against one or more of the following specific insects as indicator species: *Hylotrupes bajulus, Anobium punctatum, Lyctus brunneus*, and where appropriate, termites.

Note

CAs should evaluate the available data to determine whether they are sufficient for label claims as follows:

a) for general claims against "wood boring beetles"

The majority of efficacy tests for authorisation are likely to be for treatments against *H. bajulus*. Therefore data against this beetle species should be available and will be considered adequate to cover this claim.

b) for claims against a specific beetle species

If claims against individual beetle species are detailed on a product label, then suitable efficacy data against those named target pests will be required.

c) for claims against termites

Some data on efficacy against termites will only be required when the product is to be marketed for use as a termiticidal product or where local requirements demand such activity.

For a product claiming activity against termites, suitable data demonstrating preventive efficacy against a European *Reticulitermes* species will be required.

For a product claiming efficacy against overseas tropical termites, suitable data demonstrating preventive efficacy against relevant species will be required.

2.2.3.2 Use Class 2

Required data

Refer to EN 599-1:2009 table 2.

Data will include suitable laboratory data using treated test blocks to determine the toxic values against the fungi and insects as appropriate.

Test species

The test species used will depend upon the label claims and will include as a minimum the brown rot fungi and insects if appropriate (as in Use Class 1).

Note

The CAs evaluate the available data to determine if they are sufficient for label claims as follows:

a) For claims against wood rotting fungi the following data have to be available:

Suitable laboratory data demonstrating efficacy against brown rot fungi after ageing test in accordance with EN 73.

b) For claims against wood discolouring fungi the following data have to be available:

- Suitable laboratory data on the protective efficacy of the product against blue stain in service after ageing test in accordance with EN 73 or after a natural or artificial weathering cycle as given in EN 152;
- The application process used in the tests (i.e. whether by superficial or penetrative treatment) has to be in accordance with label claims.

c) For claims against insect pests the following data have to be available:

As outlined in Use Class 1.

2.2.3.3 Use Class 3

Required data

Refer to EN 599-1:2009 table 3a and table 3b.

Data will include suitable laboratory data using treated test blocks to determine the toxic values against the fungi and insects as appropriate.

Test species

The test species used will depend upon the label claims and will include as a minimum the brown rot fungi and insects if appropriate (as in Use Class 1).

Note

The CAs should evaluate the available data to determine if they are sufficient for claims matrix as follows:

a) For claims against wood rotting fungi, the following data have to be available:

- Suitable laboratory tests as outlined for Use Class 2 and in addition, the efficacy will be demonstrated following preconditioning of the treated test blocks by a suitable leaching procedure according to EN 84

b) For claims against wood discolouring fungi the following data have to be available:

- Suitable laboratory data on the protective efficacy of the product against blue stain in service after a natural weathering or an artificial weathering as given in EN 152.
- The application process used in the tests (i.e. whether by superficial or penetrative treatment) should be in accordance with label claims.

c) For claims against insect pests (if relevant) the following data have to be available:

As outlined in Use Class 1, and in addition the efficacy will be demonstrated following pre-conditioning of the treated test blocks by a suitable leaching procedure according to EN 84 if technically possible (i.e. this is not the case for EN 20-1 and 20-2 due to methodological constraints).

In Use Class 3, data (e.g. EN 330, literature, monitoring or other methods) is recommended to support the derived application rate.

Moreover EN 330 may be used as an alternative to basidiomycetes laboratory tests (EN 113 + EN 84) for product under coating.

2.2.3.4 Use Class 4

Required data

Refer to EN 599-1:2009 table 4.

Data will include suitable laboratory data using treated test blocks to determine the toxic values against the fungi and insects as appropriate. In this situation available data should only include application of the preservative by penetrative treatments.

Test species

Test species used will depend upon the label claims and will likely include the following target organisms: brown and white rot fungi, soft rot micro-fungi and if relevant to label claims, blue stain fungi and insects as appropriate.

Note

The CAs should evaluate the available data to determine if they are sufficient for matrix claims as follows:

a) For claims against wood rotting fungi, the following data have to be available

- Suitable laboratory data as outlined for Use Class 3 with the following supplements:
  - all laboratory data should derive from impregnated treated test blocks (i.e. a penetrative treatment) with the test formulation to determine the toxic values against both brown and white rot fungi separately;
  - a suitable laboratory test to determine the toxic efficacy against soft rot fungi and other soil inhabiting microorganisms is required;

b) For claims against wood discolouring fungi, the following data have to be available:

- A suitable laboratory test determining the protective efficacy of the product against blue stain for wood in service as given in EN 152.

c) For claims against insect pests, the following data have to be available:

- As outlined for Use Class 1 and in addition, efficacy will be demonstrated following pre-conditioning of the treated test blocks by a suitable procedure according to EN 73 and to EN 84 separately).

In Use Class 4 data (e.g. EN 252, literature, monitoring or other methods) will be provided to support the derived application rate.

2.2.3.5 Use Class 5

Required data

Refer to EN 599-1 table 5.

The principal agent of decay in this situation is the marine borers. Therefore in this Use Class available data must include evidence of efficacy in a relevant marine field trial carried out for a minimum of 5 years (e.g. to EN 275 or an equivalent test).

The decay in this situation by basidiomycetes fungi does occur but marine soft rot fungi are more common causing surface softening of timber. Assessment of products against marine fungi is not normally conducted using routinely laboratory tests because of the difficulties for providing conditions which appropriately model the marine environment. There is, at present, not a recognised standard laboratory test for assessment of timber intended for use in salt water.

Test species

Test species used will depend upon the label claims. The principal agent of decay in the marine environment is the marine borers although claims against fungi can also be made.

The CAs evaluate the data to determine if they are sufficient for label claims as follows:

For claims against wood rotting fungi and marine borers, the following data have to be available:

• For fungi available data as outlined in Use Class 4 as a surrogate has to be acceptable.

• For marine borers, a relevant marine field trial data has to be carried out for a minimum of 5 years according to EN 275

2.2.4 Treatments of wood-based panels

The biocidal treatment of wood-based panels is achieved either during or after the manufacturing process.

During the manufacturing process, product can be included into the glue prior to application or directly by wood treatment.

The evaluation of the durability of wood-based panels against brown rot fungi and white rot fungi should be carried out according to the ENV 12038 test method.

There is no specific standardized methodology allowing the evaluation of the resistance of treated wood-based panels against soft rot or insects such as *Lyctus spp.* or termites. However, some of the existing standards usually applied to solid wood can be adapted to the evaluation of wood-based panels: CEN/TS 15083-2 (natural durability to soft rot fungi), EN 20-2 (*Lyctus spp.*), EN 117 and EN 118 (termites).

For post-manufacturing treatment, product can be applied by using a surface application process or pressure process.

In that case, the EN 599-1 is appropriate for determining the retention of post manufacture treatment.

2.2.5 Determination of preventive product application rate with regard to service life

The evaluation of PT8 products efficacy is based on the retention of the product as determined in standard test methods, e.g. according to standards listed in EN 599-1. The values determined in this way are critical values (CV's) for a particular formulation. The application rates derived from the CV's are deemed to provide only a baseline efficacy and no conclusion on service life can be made. Indeed, neither is the term service life an absolute measure and no uniform mathematical model exists to derive such from CV's, nor is determination / claim of a distinct service life part of the BPR. Estimation of service life (ESL) is based on the assumption, that different parameters have an impact on the service life of wood. This is explained in ISO 1586-1 and ISO 15686-2.

An estimated service life of wooden products is influenced e.g. by local exposure conditions, maintenance, consumer expectation and long term experiences from field testing or industrial experiences. This can provide justification for setting higher or lower retention rates as derived from CV's only.

Because the concept of ESL is not part of the BPR and claims for a specific service life is consequently solely the applicant's responsibility, the applicant shall have the right to apply for lower or higher retentions than just the CV up to the retention rate which is limited by the human health and environmental risk assessments.

In order to support his claim, for UC3 claims, the applicant should submit data from e.g. literature, EN 330. For UC4, the applicant will provide, EN 252 (applicable to UC4 claims) and/or other methods for justification.

Particular specification for use class 4:

- The field tests sites (minimum two) or the data extracted from literature shall be representative for climatic zones with regards to the markets targeted by the product. The selected sites shall allow the evaluation of the product's efficacy on all the biological organisms covered by the label claim.

2.3 Curative treatment

EN 14128 is the lead standard providing detailed insight into the minimum testing requirements for wood preservatives claiming curative activity. It shall be noted, that testing standards concerning PT8 products are only available for testing against wood boring insects and curative action against dry rot (ENV 12404).

It is important to understand that conducting curative treatments may comprise series/combinations of different steps and application methods/techniques in order to achieve the desired result and quite often result in providing preventive and curative efficacy at the same time. This becomes obvious e.g. in the case of dry rot.

The curative treatment against dry rot in walls (mortar) will result in creating a 'preventive' barrier in / on walls hindering the fungus to grow through and prevent infection of new wood adjacent to the wall.

2.3.1 Wood boring insects

Data required to support label claims for curative efficacy may include some tests generated using existing EN standards for the relevant beetle species or other alternative supporting data.

A number of EN standard tests exist for curative treatments for insecticides against *Hylotrupes bajulus* (ENV 1390) and *Anobium punctatum* (EN 48).The curative activity against *Lyctus* is not tested separately but is derived from results from testing against *Anobium punctatum* and *Hylotrupes bajulus.*

2.3.2 Termites

The control of termites enters into the scope of the PT8 and the PT18 depending of the use of the product. The definition of the product type is related to the use/mode of application of the product.

The reader is also invited to refer to the PT18 efficacy guideline.

The curative treatments against termites are designed most of the time to kill the termite colony and prevent degradation of wood.

We can distinguish treatment applied to wood, for example treatment of art furniture, wood rubble from treatment applied to other support than wood for example soil or masonry.

If the product is applied on wood, then this product is covered by the requirement of the PT8. If the product is applied on another support than wood then it is covered by PT18.

We can distinguish three groups of termites:

2.3.2.1 Drywood termites (Cryptotermes, Kalotermes)

Drywood termites live inside of the wood which is attacked. The curative treatments applied to the wood consequently destroy the entire colony.

2.3.2.2 Subterranean termites (Reticulitermes, Coptotermes, Heterotermes)

The core of the subterranean termite colony is located in the soil. Termite workers built tunnels to reach wood and destroy it. The treatment applied on infested wood kills the termites present inside of the wood but not the other members of the colony.

2.3.2.3 Tree termites (*Nasutitermes*)

Tree termites built epigeous (above-ground) nests, frequently on living trees. As a part of the colony has a subterranean location, termites infestations of wood in building may originate either from the nestmates located in the ground or in the epigeous nests. The treatment applied on infested wood kills the termites presents inside the wood but not the others members of the colony.

2.3.3 Fungi

Any claims for curative activity against wood rotting fungi will be supported by suitable efficacy data. No EN standard test protocols presently exist for curative treatments applied to wood. In general, as curative treatment, the infected wood is cut away. To prevent infection of the new placed wood with fungi coming from the surrounding masonry, this masonry can be treated with biocides.

There is a specific EN standard (ENV 12404) for the treatment of masonry against the dry rot fungus *Serpula lacrymans.*

In all cases CAs evaluate the data available to determine if they are sufficient for supporting the label claims.

2.4 Resistance

Information on resistance and the likelihood of its development is required for BPR Annex I inclusion and is also demanded for product authorisation.

At this point, no target organism resistance in field of chemical wood preservatives is known.

More information on resistance can be found in Chapter 6.2 of this TNsG on Product Evaluation, in the Chapter 10 on the TNsG on the BPR Annex I inclusion and on the website of the Insecticide Resistance Action Committee and the Fungicide Resistance Action Committee (FRAC: http://www.frac.info).

3. Biological re-testing after changing the product formulation

While EN599-1 and EN 14128 provide the baseline for the testing requirements of new products, the corresponding annexes to both standards provide guidance on testing requirements when a formulation variation is caused by the addition, the substitution or removal of an active substance. Not all changes are subjected to re-testing and the informative sections of the standards do allow the consideration and taking into account of other data on a case by case expert judgment basis without additional testing. These data sources are not defined in detail but could include:

- Literature data;
- Certification of the product by recognised national quality scheme systems e.g. CTBP+RAL;
- National registrations;
- Others.

For any other changes in the formulation, refer to the informative annex A of EN599-1 and EN 14128.

Appendix 1. Information on the principle target organisms outlined in the document

Fungi

- Wood rotting fungi

White rot/ brown rot fungi (*Basidiomycetes):*

Fungi responsible for brown rot (e.g. *Serpula lacrymans, Coniophora puteana*) and white rot (e.g. *Coriolus versicolor, Donkioporia expansa*)

Soft rot fungi (mainly *Ascomycetes, Deuteromycetes*)*:*

Fungi responsible for a type of rot characterised by surface softening of the wood although they also cause rot at depth *(e.g. Chaetomium globosum).* They are specifically significant for wood in ground contact.

- Wood discolouring fungi

Sapstain*:*

The blue-black and brown discolouration of freshly felled logs or sawn timber have an economic importance. Sapstain causing fungi can only colonise wood as long as the sap wood contains enough water to provide solved sugars as a nutrient for these fungi ("green" wood). Therefore, these fungi can be controlled by rapid drying of the wood after felling, chemical treatments are sometimes used.

Common sapstain species include e.g. *Stereum spp,* blue staining species.

Blue stain cause blue to black permanent colour of variable intensity and depth mainly in the sapwood depending on the wood species. This does not result in appreciable alteration of the mechanical properties but can increase the permeability of the wood and thereby makes it more susceptible to fungal degradation.

Common blue staining species include e.g. *Aureobasidium* spp*, Ceratocystis* spp

Mould fungi:

Fungi, e.g. *Aspergilus spp*, *Penicillium spp* being evident as spots of various colours on the surface of moist wood. (for instance, as a result of high relative humidity or of condensation of water vapour). They do not significantly alter the mechanical properties of the wood but have a special significance for wood in service if discoloration is undesirable or unacceptable.

For green sawn timber, the moulds are covered by the CEN TS 15082 standard. But for the preservation of solid wood against mould, the EN 152 does not cover mould and no CEN standard is available. In that case the applicant is invited to submit relevant data (in house method, literature data...) which could be accepted by expert judgement.

Insects

- Fresh wood insects:

A number of insects bore and tunnel into fresh logs after they are cut and debarked. These fresh wood insects feed upon the starch reserves and can cause damages to the wood. Most of them belong to the families of Scolytidae (genus *Scolytus*), Cerambycidae (genus *Phematodes*), Lyctidae (genus *Lyctus*), Anobiidae (genus *Anobium*), Bostrychidae (genus *Bostrychus*).

Some other groups, belonging to the Scolytidae family, bore the fresh logs and introduce 'Ambrosia' fungi inside the gallery, resulting in wood staining (as a consequence of the development of the dark hyphae).

- Wood boring beetles (Coleoptera)

Insects which lay their eggs in wood pores or cracks and whose larvae feed upon wood. They are present throughout Europe but the risk of attack varies greatly and is ranged from high to insignificant. The most important are *Hylotrupes bajulus*, *Anobium punctatum* and *Lyctus brunneus*.

Hylotrupes bajulus (House longhorn beetle)

This beetle attacks many softwood species and can cause significant structural damage. Many softwood species are affected, whereas hardwoods are not attacked. Larvae damage both the sapwood and the heartwood of non durable species.

This insect occurs throughout Europe, but is of less importance in the north and north-west of Europe. The vitality and longevity of larvae depend principally on ambient temperature and the wood moisture content.

Anobium punctatum (Common furniture beetle)

The larvae attack the sapwood of certain softwood and hardwood species. The damage can extend to the heartwood in some wood species and can have occasionally a structural significance impact. Its presence is particularly noted in coastal climates and where damp conditions prevail.

Lyctus brunneus (Powder post beetle)

The larvae attack sapwood of certain starch-containing hardwoods and have a significant impact throughout Europe for both European and imported hardwood timbers.

- Termites (Isoptera)

Termites belong to the order Isoptera. In Europe and in the European tropical overseas regions there are three main termite families; subterranean termites (Rhinotermitidae), drywood termites (Kalotermitidae) and tree termites (Nasutitermitidae):

- *Reticulitermes* is the most common genus encountered from the Rhinotermitidae family in Europe. The main species registered are: *R. flavipes* (former *R. santonensis*), *R. grassei, R. lucifugus*, *R. banyulensis, R. balkanensis, R. urbis.*

  They are widespread around the Mediterranean basin (Spain, France, Italy, Portugal, Balkans, and Greece) and Black Sea (Turkey, Romania), though some termite spots in the UK or Germany have been reported. Several unanswered questions remain about the origin of these termites. While some *Reticulitermes* are native to Europe, others may be related to species from eastern North America and the Middle East (Israel, Asian Turkey, etc.).

  Coptotermes and *Heterotermes* are the main two genera belonging also to the Rhinotermitidae family located in the European tropical overseas regions.

- *Kalotermes flavicollis* and *Cryptotermes brevis* are the main two species of drywood termites present in Europe (especially in the coastal areas of Mediterranean countries and Canary Islands). *Cryptotermes* is a main genus belonging to drywood termites encountered in the European tropical overseas regions.

- *Nasutitermes* is the main genus belonging to the Termitidae family (tree termites) encountered in the European tropical overseas regions.

Marine borers

This term is applied to marine invertebrates such as *Limnoria* spp *and Teredo* spp which need a certain salinity of water and which hollow out extensive tunnels and cavities in wood. These organisms can cause serious damage to fixed or floating structures.

In European waters the most common marine borers are shipworm (*Teredo navalis*) and gribble (*Limnoria spp.*). Shipworm is a bivalve mollusc related to the sea snails and

mussels. It is a soft, worm like animal with its shell modified into hard grinding jaws. The larvae are part of the microscopic zooplankton and swim freely in the sea until they settle on timber. They develop a shell with which they bore into the wood and lodge there, growing into large worms in holes up to 5 mm in diameter. They destroy the wood by making a massive network of galleries throughout the timber. Gribble is a small shrimp-like crustacean about 4 mm in length. It bores into the surface of the wood and lodges near the surface making numerous side burrows. The combination of this boring and wave action causes rapid erosion of marine timbers.

Appendix 2. Informative list of standards for efficacy assessment of wood preservatives

Table 12 List of ISO standard

2-1: List of ISO standard			
Standard reference	**Date**	**Title**	**Country**
ISO 15686-1	2011	Buildings and constructed assets. Service life planning. General principles	ISO 15686-1
ISO 15686-2	2001	Buildings and constructed assets. Service life planning. Service life prediction procedures	ISO 15686-2
ISO 17025	2005	General requirements for the competence of testing and calibration laboratories	ISO 17025

Table 13: List of European standard (based on CEN TC38)

The reader is strongly invited to check for new versions of the standard on the website of the CEN website: www.cen.eu

2-2: List of European standard (based on CEN TC38)	
Standard reference	**Title**
EN 73:2014	Accelerated ageing test of treated wood prior to biological testing. Evaporative ageing procedure
EN 84:1997	Accelerated ageing tests of treated wood prior to biological testing. Leaching procedure
EN 113:+ A1: 2004	Method of test for determining the protective effectiveness against wood destroying basidiomycetes - Determination of the toxic values
EN 117:2013	Determination of toxic values against *Reticulitermes* species (European termites) (Laboratory method)
EN 118:2014	Determination of preventive action against *Reticulitermes* species (European termites) (Laboratory method)
EN 152:2012	Determination of the protective effectiveness of a preservative treatment against blue stain in wood in service – laboratory method
EN 252: 2014	Field test method for determining the relative protective effectiveness of a wood preservative in ground contact
EN 275:1992	Determination of the protective effectiveness against marine borers
EN 330: 2014	Field test method for determining the relative protective effectiveness of a wood preservative for use under a coating and exposed out-of-ground contact: L-joint method

2-2: List of European standard (based on CEN TC38)	
Standard reference	**Title**
ENV 807:2001	Determination of the effectiveness against soft rotting micro-fungi and other soil inhabiting micro-organisms
EN 839: 2014	Determination of the protective effectiveness against wood destroying basidiomycetes. Application by surface treatment
EN 20-1:1992	Determination of the protective effectiveness against *Lyctus brunneus* (Stephens) – Part 1 Application by surface treatment (Laboratory method)
EN 20-2:1993	Determination of the protective effectiveness against *Lyctus brunneus* (Stephens) – Part 2 Application by impregnation (Laboratory method)
EN 46-1:2010	Determination of the preventive action against *Hylotrupes bajulus* (Linnaeus) – Part 1: Larvicidal effect (laboratory method)
EN 46-2:2010	Determination of the preventive action against *Hylotrupes bajulus* (Linnaeus) – Part 1: Ovicidal effect (laboratory method)
EN 47:2005	Determination of the toxic values against larvae of *Hylotrupes bajulus* (Linnaeus) – (Laboratory method)
EN 48:2005	Determination of eradicant action against larvae of *Anobium punctatum* (De Geer) (laboratory method)
EN 49-1:2005	Determination of the protective effectiveness against *Anobium punctatum* (De Geer) by egg laying and larval survival –Part 1 Application by surface treatment (laboratory method)
EN 49-2:2005	Determination of the protective effectiveness against *Anobium punctatum* (De Geer) by egg laying and larval survival –Part 2 Application by impregnation (laboratory method)
EN 370:1993	Determination of eradicant efficacy in preventing emergence of *Anobium punctatum* (De Geer)
EN 1390:2006	Determination of the eradicant action against *Hylotrupes bajulus* (Linnaeus) larvae - laboratory method
EN 599-1: +A1: 2014	Durability of wood and wood-based products - Efficacy of preventive wood preservatives as determined by biological tests – Part 1: Specification according to use class.
EN 335:2013	Durability of wood and wood-based products -Use classes: definitions, application to solid wood and wood based products
EN 14128: 2004	Durability of wood and wood-based products - Performances criteria for curative wood preservatives as determined by biological tests
CEN/TS 15082: 2006	Determination of the preventive effectiveness against sapstain and mould fungi on freshly sawn timber - Field test
CEN/TS 12037:	Wood preservatives - Field test method for determining the

2-2: List of European standard (based on CEN TC38)	
Standard reference	**Title**
2005	relative protective effectiveness of a wood preservative exposed out of ground contact - Horizontal lap-joint method
ENV 12038: 2003	Durability of wood and wood-based products. Wood based panels. Method of test for determining the resistance against wood-destroying basidiomycetes
ENV 12404:1997	Durability of wood and wood based products – Assessment of the effectiveness of a masonry fungicide to prevent growth into wood of Dry Rot Serpula lacrymans (Schumacher ex Fries) S.F Gray – Laboratory method
CEN/TS 15083-2:2005	Durability of wood and wood-based products. Determination of the natural durability of solid wood against wood-destroying fungi - Test method – Part 2: soft rotting micro-fungi
EN 73:2014	Accelerated ageing test of treated wood prior to biological testing. Evaporative ageing procedure

Table 14: List of European standards (based on CEN TC 124)

2-3: List of European standards (based on CEN TC 124)	
Standard reference	**Title**
EN 636:2012	Plywood specificationOriented Strand Boards (OSB), definitions, classification and specifications
EN 300:2006	Oriented Strand Boards (OSB), definitions, classification and specifications
EN 309:2005	Particleboards - Definitions and classification
EN 312:2010	Particleboards, requirements.
EN 622-1:2003	Fibreboards - Specifications - Part 1: General requirements
EN 1001-1:2005	Durability of wood and wood based products – Terminology – Part 1: List of equivalent terms
EN 1001-2:2005	Durability of wood and wood based products – Terminology – Part 2: Vocabulary

Table 15: List of national standard or method used

This table presents the list of national standards or methods used available at the writing time of this document. As expressed in the introduction, this document is a living document and this table can be updated.

2-4: List of national standard or method used			
Standard or method	**Date**	**Title**	**Country**
NF X 41-547	1992	Produits de préservation–du bois - Détermination de l'efficacité fongicide des produits de protection temporaire des sciages frais - Méthode de laboratoire.	FR
NF XP X 41-549	1999	Produits de préservation - Évaluation de l'efficacité fongicide des produits de protection temporaire des sciages frais - Méthode sur site	FR
CIRAD FT-CR 13-C-71-4		Insecticide effectiveness : one wormhole of the treated log specimen Fongicidal effectiveness: First internal decay of the treated log specimen	FR
NEN 7345	1995	Leaching characteristics of solid earthy and stony building and waste materials - Leaching tests - Determination of the leaching of inorganic components from waste materials with the diffusion test	NL
BS 8417	2011	Preservation of wood. Code of practice	UK
BS 3900-G6	1989	Methods of test for paints. Assessment of resistance to fungal growth	UK

Appendix 3. Efficacy criteria in biological tests

The efficacy criteria listed in the table below comprise of abridged provisions addressed in the standards (e.g. EN 599-1) and can serve as an overview only. The criteria are very often related to supplemental requirements which are not mentioned in the table and which are as well essential for a correct determination of efficacy values. It is a therefore necessary when evaluating individual scenario/submissions to apply the efficacy requirements from the original standards (in their most recent versions or in the version relevant at the time of testing).

Criteria of validity: for the majority of tests, untreated test blocks must show mass loss or staining as a sign of virulence of the tests species.

Table 16: Efficacay Criteria

European standard	Criterion	Reference[2]
EN 113	Mid toxic value (mtv) most tolerant fungus	EN 599-1/ table 2
EN 117	1- The lowest concentration that protects the wood (= no damage rating >1, for the 3 specimens) 2- The next lowest concentration (at least 1 specimen with a rating of 2 or greater)	EN 599-1/ table 1
EN 118		EN 599-1/ table 1
EN 152	Surface rating: at end of test, no individual rating > or = 2, Interior rating: for each measurement point, minimum stain free depth of 1 mm and mean stain free depth > or = 1,5 mm	EN 599-1/ table 2
EN 252	After 5 years, mean of the upper nominal retention (unrP)/0.75 and the lower nominal retention (lnrP)/0.17	EN599-1/ table 4
EN 275	After 5 years, mean of the upper nominal retention (unrP)/0.75 and the lower nominal retention (lnrP)/0.17	EN 599-1 / table 5
EN 330	After the untreated control specimens have reached a median rating of > or = 3, nominal mean rating of replicates for non destructive assessment (V1), nominal mean rating for external surfaces and those visible within the joint replicate of destructive assessment (V2), nominal mean rating for surfaces created by sawing of replicates for destructive assessment (V3), > than for reference, and number of replicates treated with the wood preservative product with a rating of 2 or above, < than the number of replicates treated with the reference	EN 599-1 / table 3

[2] EN 599-1 :2009 ; EN 14128 :2004, XP ENV 12038:2003,

European standard	Criterion	Reference[2]
	preservative with a rating of 2 or above	
ENV 807	Nominal effective retention according article 10 and annex E of ENV 807	EN 599-1 / table 4
EN 839	Lowest application level at which no more than one of the test specimens shows visible decay inside the specimens and no more than one specimen showing signs of decay exclusively at its surface has suffered a loss in mass > 3.0% (m/m) but < 5,0% (m/m) independent of the number of valid replicates	EN 599-1 / table 3
EN 20-1	No live larvae/emerged beetles at end of test	EN 599-1/ table 1
EN 20-2	Mid toxic value (mtv)	EN 599-1/ table 1
EN 46-1	100% mortality at end of test	EN 599-1/ table 1
EN 46-2	100% repellence or 100% mortality at end of test	EN 599-1/ table 1
EN 47	Mid toxic value (mtv)	EN 599-1/ table 1
EN 48	80% mortality at end of test	EN 14128 / table 1
EN 49-1	No live larvae at end of test	EN 599-1/ table 1
EN 49-2	Mid toxic value (mtv)	EN 599-1/ table 1
EN 370	Maximum emergence 3 out of 72 larvae inserted	EN 14128 / table 1
ENV 1390	80% mortality at end of test	EN 14128 / table 1
ENV 12038	Mean mass loss < 3% and no more than one test specimen with a mass loss >3% and <5%	ENV 12038

National standard	Criterion	Reference
XP X 41-547	Mean rating <1 and no damage of individual rating >2	French certification Laboratory of Biology FCBA
NF X 41-548	Mean rating <1 and no damage of individual > or = 2	French certification Laboratory of Biology FCBA
XP X 41-549	A minimum of 95% of planks with a rating strictly < 2	French certification Laboratory of Biology FCBA

Methods	Criterion	Reference
CIRAD FT-CR 13-C-71-4	Insecticide effectiveness : one wormhole of the treated log specimen Fungicidal effectiveness: First internal decay of the treated log specimen	CIRAD FT-CR 13-C-71-4
CEN/TS 15082	A minimum of 95% of planks with a rating strictly < 2	Laboratory of Biology FCBA

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