



## (BS) EN 350: 2016

### **Durability of wood and wood-based products - Testing and classification of the durability to biological agents of wood and wood-based materials**

Note: This new standard replaces EN 350-1 and EN 350-2 which have now been combined into one document.

It gives guidance on methods for determining and classifying the durability of wood and wood-based materials against biological wood-destroying agents. As well as wood species and wood-based materials, these methods also apply to those which have been heat-treated, preservative treated as well as to modified wood.

The wood-destroying agents considered in this standard are:

- Wood-decaying fungi (basidiomycete and soft-rot fungi)
- Beetles capable of attacking dry wood
- Termites
- Marine organisms capable of attacking wood in service.

EN 350 provides the durability classes of wood-based materials to various wood destroying organisms in four separate tables:

**Table 1: Durability Classes of wood-based materials to attack by decay fungi**

Durability Class*	Description
<b>DC 1</b>	Very durable
<b>DC 2</b>	Durable
<b>DC 3</b>	Moderately durable
<b>DC 4</b>	Slightly durable
<b>DC 5</b>	Not durable

**Note:** The durability classes refer only to the heartwood. Sapwood is classed as not durable (DC 5).



**Table 2: Durability Classes of wood-based materials to attack by wood-boring beetles**

Durability Class	Description
<b>DC D</b>	Durable
<b>DC S</b>	Not durable

**Table 3: Durability Classes of wood-based materials to attack by termites**

Durability Class	Description
<b>DC D</b>	Durable
<b>DC M</b>	Moderately durable
<b>DC S</b>	Not durable

**Table 4: Durability Classes of wood-based materials to attack by marine organisms**

Durability Class	Description
<b>DC D</b>	Durable
<b>DC M</b>	Moderately durable
<b>DC S</b>	Not durable



Durability of wood-based materials is further covered in the standard's Informative Annexes.

**Annex B** gives the biological durability of selected wood species considered of economic importance in European countries as follows:

- Table B.1 - Durability of heartwood and treatability of softwood species
- Table B.2 - Durability and treatability of temperate hardwood species
- Table B.3 - Durability and treatability of tropical hardwood species
- Table B.4 - Classification of commercial groupings

**Annex C** gives the classification of treatability of wood with aqueous wood preservatives i.e. the ease with which wood can be penetrated by a liquid applied during a process of wood impregnation. Depending on the formulation, the achieved penetration may be different.

**Table C.1: Classification of the treatability of wood**

Treatability Class	Description *	Explanation
1	Easy to treat	Easy to treat; sawn timber can be penetrated completely by pressure treatment.
2	Moderately Easy to treat	Fairly easy to treat; usually, complete penetration is not possible, but after 3 or 4 hours by pressure treatment more than 6 mm lateral penetration can be reached in softwoods and in hardwoods a large proportion of the vessels will be penetrated.
3	Difficult to treat	Difficult to treat; 3 - 4 hours by pressure treatment may not result in more than 3 mm to 6 mm lateral penetration.
4	Extremely difficult to treat	Virtually impervious to treatment; little preservative absorbed even after 3 - 4 hours by pressure treatment; both lateral and longitudinal penetration minimal.



**\*Note:** Historically treatability data may use other descriptive terms which approximate to the treatability classes as follows:

- Class 1 Permeable
- Class 2 Moderately resistant
- Class 3 Resistant
- Class 4 Extremely resistant

**Annex D** deals with the classification of permeability to water – the ease with which water penetrates a wood-based material and is released by evaporation. The term permeability differs from that of treatability as the latter measures penetration of a aqueous solution following a defined treatment schedule whereas permeability to water reflects both the spontaneous uptake and release of water during defined exposure conditions.

**Annex F** covers classification by performance i.e. the ability of a wood species or wood-based material to withstand deterioration over time. It provides an understanding of the performance of wood in service.

### Measuring durability class - advice from British Standards Institution (BSI)

- **Annex F** of EN 350:2016 states that field tests and aging procedures are required where performance is a consideration. However, changes from the previous version of EN 350 mean that field testing is no longer a requirement to measure durability class.
- BSI believes that 'testing in accordance with Informative Annex F (section F.2 paragraph 2) is essential to deliver a useful durability measure' and advises UK specifiers to follow this more stringent practice.
- Under the new standard, laboratory testing may now be used but ageing procedures are not required for these. Durability classes can therefore be assigned to wood without needing to take aging into account.
- The BSI believes that durability class is only a useful measure if it is used in the context of how a material may perform in use. Durability classes calculated using the normative text of this standard may therefore not be useful when considering how a wood species or a wood-based material might perform.