

## EuroWindow answer to Public Consultation on the Availability of Alternatives to IPBC

### General information

The window and door industry must live up to very high-quality standards to maintain the integrity, the stability and the visual appeal of the products throughout a long lifespan. It specifically relies on biocidal substances to protect against wood-damaging agents like fungi and mould. One of the most effective substances to protect wood from discolouring fungi is IPBC (3-Iodo-2-propynyl butylcarbamate) which is used in more than 70% of biocidal products authorized in Product-Type 8 (719 out of 1021 products<sup>1</sup>) and has become a well-controlled industry standard.

Given its critical role in preserving wood, particularly in the context of wood exposed to moisture or outdoor conditions (i.e. windows and door), the industry currently faces challenges in identifying equally effective alternatives. In the context of this Public Consultation, it is imperative to address why IPBC should continue to be authorized, particularly considering insufficient alternatives for the wooden window and door industry.

### 1 Alternative Identity and Properties

The identification of alternatives to IPBC requires a first screening of alternative substances which claim efficacy against blue stains and/or mould. Those should be approved for use in Product-Type 8 (PT8), should not meet the Biocidal Product Regulation (BPR) Exclusion Criteria and are compatible with the intended use of IPBC. Among the 28 Active Substances currently approved for use in PT8, only 6 meet those generic requirements<sup>2</sup>:

- OIT
- ADBAC/BKC
- ATMAC/TMAC
- DDACarbonate
- DDAC
- Potassium Sorbate

However, several limitations must be considered. Ongoing assessment as Candidate for Substitution (CfS), corrosive properties, adhesion to topcoat or efficacy are among the critical limitations to consider these Active Substances as “equivalent alternatives”.

- Efficacy range: some substances also show lower range of efficacy compared to IPBC, especially regarding specific fungi which are one of the primary reasons for using IPBC
- Corrosion with metals: some substances are quaternary ammonium compounds and present corrosion issues which compromises applications using metal hardware (screws, hinges, pivots...) such as windows and doors
- Topcoat and paint: some substances show adhesion issues therefore preventing applications where finishing layer like paint or topcoat is needed
- Candidate for Substitution: some substances are being assessed as CfS which undermines their long-term viability as sustainable replacements

Therefore, we would like to stress that, for the remainder of this answer, all abovementioned substances should be considered with care and as likely lower-quality alternatives.

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<sup>1</sup> Search on ECHA Website, Information on Biocides > Biocidal Products (18<sup>th</sup> September 2024)

<sup>2</sup> “ANALYSIS OF ALTERNATIVES to biocidal active substances meeting the substitution criteria under the Biocidal Products Regulation”, European IPBC Task Force, 20<sup>th</sup> August 2024 ([link](#))

Besides, the rules of the BPR require Biocidal Products to be authorized in each Member State where they will be used for wood preservation. A study conducted in 2024 by DHI Group shows<sup>3</sup> that out of 1021 products listed as authorized in the ECHA database, none can meet the same criteria as IPBC (Use Class, Target Organisms, Use Category etc) in any of the 28 investigated European countries.

Regarding non-biocidal alternatives, they can be divided into 3 main categories<sup>4</sup>: alternative wood protection technology, alternative wood species and alternative materials.

Regarding alternative wood protection technologies, the only 3 identified potential solutions are:

- Organowood® (pressure treatment)
- Accoya (acetylation)
- Thermowood (heat and steam treatment)

Regarding alternative wood species, hardwood species are usually showing a better protection against blue stain due to the lower share of sapwood (blue stain fungi appear primarily on sapwood). However, given of the limited amount of heartwood even in hardwood species the use of sapwood in windows and doors cannot be omitted.

Regarding alternative materials like PVC and aluminium, those are already used for the manufacturing of windows and doors but present different drawbacks regarding their environmental impact and resource depletion.

## 2 Technical Feasibility

IPBC has proven to be highly effective against a wide range of wood-degrading organisms, particularly blue stain fungi and mould, which are significant concerns in wood applications such as windows and doors. It also has proven its high tolerance with demanding quality processes such as long-lasting finish (thanks to its low interaction with paint or topcoat) or mechanical stable fixture and hardware (no corrosion with metal parts like pivots, hinges or screws).

### Efficacy on target organisms

IPBC has a high efficacy against blue stain fungi, of which *Aureobasidium pullulans* and *Sydowia polyspora* constitutes the key target organisms for wood preservation. However, and despite their theoretical efficacy against blue stain fungi, 2 of the 6 identified Active Substances – ADBAC/BKC and ATMAC/TMAC – must be immediately excluded from the scope of technically suitable alternatives due to their absence of efficacy against *Sydowia polyspora*. In the absence of protection against all key target organisms, any alternative to IPBC becomes virtually inefficient.

### Corrosion and compatibility with metals

IPBC currently has the major advantage of not showing any significant corrosive interaction with metal parts such as screws, pivots, hinges or other hardware used for the manufacturing, installation and functioning of windows and doors. Due to the necessity to use metal parts in our industry, any alternative wood preservation solution must present a high degree of compatibility with hardware and other metal parts.

Based on the analysis of alternative substances<sup>2</sup>, 4 out of the 6 identified substances – ADBAC/BKC, ATMAC/TMAC, DDACarbonate and DDAC – belong the group of Quaternary Ammoniums, which has an inherent higher corrosivity than other wood impregnation solutions<sup>5</sup>.

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<sup>3</sup> Study on the identification of biocidal products not containing IPBC, authorized according to the EU Biocidal Products Regulation (BPR) within wood preservation applications (product-type PT 8), DHI Group, 9<sup>th</sup> September 2024 (Report No 11831187) ([link](#))

<sup>4</sup> Analysis of Non-chemical Alternatives (Substance: 3-Iodo-2-propynyl butylcarbamate (IPBC)), Ramboll, September 2024 ([link](#))

<sup>5</sup> Determination of metal corrosion in wood treated with new-generation water-borne preservatives, Ahmet CAN, Hüseyin SIVRIKAYA, Cihat TAŞCIOĞLU, Drewno 2020, Vol. 63, No. 205.

## Topcoat and paint

The compatibility of IPBC with industrial process for the manufacturing of windows and doors relies on its ability to withstand top layers (primer, topcoat, paint) for the entire lifespan of the product.

As highlighted before, 4 out of 6 identified substances – ADBAC/BKC, ATMAC/TMAC, DDACarbonate and DDAC – are Quaternary Ammoniums which are showing significant adhesion issues in multi-layer systems, therefore rendering it incompatible for window and door applications.

## Detailed analysis of available alternative Biocidal Products<sup>3</sup>

A thorough screening of the list of authorized Biocidal Products available in European Member States has shown that the only 3 products (AXIL 2000 AB-B, Sinesto XT, and FKR-ACQ EXTRA) are capable of partially addressing the wood preservation needs in a very limited application (temporary protection of freshly cut timber).

No alternative – in any of the 28 European countries included in the study – was identified for any other application such as windows and doors.

## Alternative wood protection technologies

Alternative wood preservatives based on biocides-free solutions like OrganoWood® are showing promising results but should be further tested to establish the compatibility with industrial processes used by our industry.

Alternative wood protection technologies like acetylation (e.g. Accoya) have shown promising results against wood destroying fungi but are unfortunately inefficient against mould and blue stains. The use of a topcoat specifically designed for blue stain and mould protection is recommended<sup>6</sup>.

Heat treatment technologies such as Thermally Modified Timber (e.g. ThermoWood) do not currently provide Use Class 3 performance for softwood<sup>7</sup> which is required for external windows and doors due to their exposure to outdoor weathering.

## Alternative wood species

Since heartwood is usually naturally protected against blue stain/sapstain, alternative wood species must be selected within hardwood species for their greater heartwood vs sapwood ratio. The most common species of hardwood available in Europe are Beech and Oak which, despite better predispositions to prevent the growth of wood discolouring fungi, still require a treatment against blue stain and mould when 100% heartwood cannot be secured and therefore do not represent a technical alternative to the use of IPBC.

Tropical hardwood often has a long natural durability and lifespan and can be used as an alternative to biocide-treated wood products. However, the availability of tropical hardwood is limited and special precautions must be taken when harvesting tropical wood to preserve forest areas and protect biodiversity in the tropics. Figures presented from the University of Copenhagen show that approximately 2 million m<sup>3</sup> of sawn tropical wood is imported annually to the USA and the EU<sup>8</sup>, compared to the production and consumption of 27 million m<sup>3</sup> of biocide-treated wood in the same region (Europe: ~6.5 million m<sup>3</sup>, USA: ~21 million m<sup>3</sup>).<sup>9+10</sup> For this reason, tropical wood cannot readily replace the consumption of treated wood in either the USA or the EU.

<sup>6</sup> Accoya – Essential Coating Guide

<sup>7</sup> ThermoWood Handbook 2023, Table 10 (link)

<sup>8</sup> ITTO's data ([https://www.itto.int/biennial\\_review/](https://www.itto.int/biennial_review/)) for sawn tropical wood to both the EU and USA

<sup>9</sup> Vlosky, R.P. Statistical Overview of the U.S. Wood Preserving Industry: 2007; North American Wood Pole Council: Vancouver, WA, USA, 2009; p. 81.

<sup>10</sup> Salminen, E.; Valo, R.; Korhonen, M.; Jernlås, R. Wood Preservation with Chemicals: Best Available Techniques (BAT); Nordic Council of Ministers: Copenhagen, Denmark, 2014

### 3 Economic Feasibility

#### Chemical alternatives

The economic analysis of implementing alternative Active Substances or alternative Biocidal Products has little to no significance due to the absence of technically suitable alternatives as presented in the previous answers.

In general, shifting to chemical alternatives would impose significant costs on manufacturers. IPBC is well-established and widely used across Europe, making it cost-effective for small and large-scale operations. Transitioning to chemical alternatives, which may not have the same application method, would require to invest in new impregnation equipment. Besides, as shown by the Technical Feasibility assessment, all identified chemical alternatives are of lower quality and would require major changes to the impregnation and finishing process to be used for windows and doors, if possible.

#### Non-chemical alternatives

As far as non-chemical alternatives are concerned, they should be addressed individually as they may have an impact on the supply chain, the production equipment or both:

#### Alternative wood protection technologies

Assuming that a sufficient supply chain was already in place (see comment regarding availability), the cost of Accoya and OrganoWood® technologies are more than 10 times superior to regular softwood from European pine and spruce, making both an unviable solution for the industry. Thermally Modified Timber like ThermoWood are lower in price but still cost around 3.5-4 times the price of European softwood.

#### Alternative wood species

Due to extreme discrepancy in availability – hardwood only represent 6% of the total production of wood in Europe, see answer regarding availability of alternative wood species – the cost of alternative wood species like oak is typically 5 times greater than the price of pine or spruce.

#### Alternative material

Although a direct comparison of material remains difficult, we expect the greatest financial challenges to come from required investments in production equipment: a shift from the production of timber windows and doors to PVC or Aluminium windows and doors requires a complete rebuild of the sash and frame production line (in addition to all required adjustments of the supply chain) with different educated workers. EuroWindow has not assessed such investment costs but expect them to be virtually impossible to accept for most window and door producers who are mainly SMEs.

### 4 Hazards and Risk of the Alternative

#### Risk and hazards of alternative Active Substances and Biocidal Products

While some alternatives Active Substances may offer protection against certain fungi, they also introduce new hazards. For instance, quaternary ammonium compounds present risk classes with similar or greater hazard than IPBC.

Although Potassium Sorbate presents a lower hazard profile, it cannot be used in most application – especially wooden window and doors – due to its very limited intended use and efficacy (protection of freshly cut timber against blue stains for 2-4 weeks).

The risks associated with alternative Biocidal Products are usually similar to the risks associated to their constituent (see previous paragraphs).

#### Risk and hazards of alternative wood species

We have not identified any risks for human health associated with the use of alternative wood species when sourced from sustainably managed forestry within the EU. Some exotic species are however sourced from outside the EU where the traceability of forest resources is more difficult to obtain and the sustainable management of forests more difficult to guarantee. Besides,

several of those exotic species need to be transported across thousands of kilometres which comes at a higher CO<sub>2</sub> footprint.

The same assumption can be made for acetylation processes like Accoya which relies on wood species (*Pinus Radiata*) mainly grown in New Zealand.

### **Risk and hazards of alternative materials**

Both PVC and aluminium – currently used in the window and door industry – are non-renewable resources and a disruption in the wood sector would necessarily put some additional and unnecessary pressure on those two materials.

## **5 Availability**

### **Availability of alternative Active Substances and Biocidal Products**

The availability of suitable alternatives to IPBC is extremely limited. As shown in the analysis conducted by the European IPBC Task Force<sup>2</sup>, only 6 substances may theoretically be considered as alternatives to IPBC. None of those alternative however meets the technical requirements needed by the typical Use Cases of IPBC.

There are currently more than 760 Biocidal Products authorized under PT8 containing IPBC for many applications. By comparison, from the list of identified potential alternative substance, ADBAC has the largest number of registered products with 103 authorizations in total. DDAC – with the second largest number of authorized products – only covers 8 products from PT8. Those 2 substances are both under assessment for Candidate for Substitution and therefore cannot be considered sustainable alternatives available on the long-term.

When taking into account the technical scope needed to substitute any of the Biocidal Products currently used by the window and door industry, no IPBC-free products were identified by DHI Group<sup>3</sup> (Use Case 1, 2 and 3 for windows and doors). For other Use Cases, while countries like Germany or France currently have 85 and 111 authorized Biocidal Product showing efficacy against blue stains, only 1 and 0 could be identified without IPBC for the limited application of temporary treatment of freshly cut timber.

Besides, assuming that one or several alternative Active Substances were to be identified soon, 2 additional steps – each of them years-long – would still be required to reach a market-compatible situation:

1. Development of biocidal products, including all necessary testing on long-term efficacy of newly developed products
  2. Authorization of new Biocidal Products in all European market to substitute the existing products based on IPBC
- Based on known state-of-the-art test methods and typical timelines for product authorization, these necessary steps cannot be fully completed within 10 years – not to mention the absence of suitable alternative Active Substance as previously demonstrated.

### **Availability of alternative technologies**

All considered alternative technologies must be regarded by comparison with the available volumes of wood possible to treat with IPBC-based preservatives. While European softwood has an annual production capacity<sup>11</sup> of ≈80'000'000 m<sup>3</sup> – and hardwood of ≈5'000'000 m<sup>3</sup> – one must compare this production capacity with the current and projected capacities of alternative technologies

- Accoya: ≈80'000 m<sup>3</sup>/year (in Europe) with a goal of ≈123'000 m<sup>3</sup>/year (worldwide) with the completion of the US-based production plant in the coming years<sup>12</sup>

<sup>11</sup> EOS Facts and Figures ([link](#))

<sup>12</sup> Accoya Annual Report 2023 ([link](#))

- Organowood®: Using one of the largest European wood treatment plant, production capacity is expect to be around ≈250'000 m<sup>3</sup>/year<sup>13</sup>
  - ThermoWood: The official production of ThermoWood in 2023 was ≈230'000 m<sup>3</sup>/year<sup>14</sup>
- Combined, the 3 abovementioned technologies represent less than 1% of the production capacity of European softwood species.

### Availability of alternative wood species

While Pine and Spruce alone currently represent more than 40% of the European biomass stock<sup>15</sup>, Beech and Oak only respectively represent 10% and 8% of the same stock. Besides, both species present a non negligible proportion of sapwood, rendering them naturally exposed to blue stain and requiring specific preventive treatment.

### Availability of alternative materials

With the increasing demand for recycled material in the PVC and aluminium sector for window and doors (specifically for their low CO<sub>2</sub> footprint), material availability will become a challenge soon. Any substitution from the wood sector to one of those two materials would disrupt the supply chain and destabilize the balance between the 3 materials wood, PVC and aluminium.

## 6 Other Comments

None.

## 7 Conclusion on suitability and availability of the alternative and summary

Regarding the suitability of alternatives:

- No alternative Active Substance could meet the basic technical requirements of wooden windows and doors manufacturers. Insufficient efficacy against key target organisms, high corrosion with metal and incompatibility with topcoats are among the most challenging issues raised by potential alternatives.
- When looking at the specific efficacy of Biocidal Products authorized at national level, no authorized product could be identified in any of the 28 European countries covered by the study<sup>3</sup>.
- Wood modification technologies are currently uncertain regarding their protection against blue stains (Accoya, OrganoWood®) or show some significant drawbacks in terms of e.g. mechanical strength needed for the window and door industry (ThermoWood).

Regarding the availability of alternatives:

- The availability of suitable alternative Active Substances is virtually non-existent. The technical limitations of most substances cross-examined with the CfS status of some of those substances prevent any availability for the window and door sector in the coming years.
- Like Active Substances, the availability of alternative Biocidal Products is close to zero when looking at all major European countries. The negligible number of identified products for specific countries are basically irrelevant for the window and door industry (protection against blue stains impossible throughout the lifespan of the product).
- Wood modification technologies might bring interesting research areas but are currently representing – even under optimistic assumptions – less than 1% of the production capacity of softwood in Europe.
- Alternative EU-grown hardwood species such as Oak or Beech represent less than 7% of the produced softwood and can therefore not be considered as alternative due to the limited availability.

<sup>13</sup> Organowood ([link](#))

<sup>14</sup> ITWA Production Statistics 2023 ([link](#))

<sup>15</sup> EOS Annual Report 2023-2024, Fig. 2.5 ([link](#))

- Having to transfer all production capacities from wood to either PVC or metal like Aluminium would not only have disastrous consequences for the window and door industry (essentially SMEs) due to the large investment costs in new production equipment but would also disrupt the entire supply chain by destabilizing the balance between the 3 materials (wood, PVC, aluminium).

Given these limitations, IPBC remains the most suitable and effective active substance for wood preservation in industry, especially for applications that require long lasting quality and visual integrity. Its 7 years reauthorization is essential to maintaining the relevancy of the wood sector, especially in light of the EU ambitions to decarbonize the construction sector by 2050.

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**About EuroWindoor AISBL** – EuroWindoor AISBL was founded as an international non-profit Association, in order to represent the interests of the European window, door and facade (curtain walling) sector. Our 19 national associations speak for European window, door and facade manufacturers that are in direct contact with consumers, and thereby having large insights on consumers' demands and expectations. We are at the forefront interacting with dealers, installers and consumers buying windows and doors, and the companies behind the associations cover selling all over Europe.