AkzoNobel
Wood Adhesives

Bio-based Adhesive Solutions

Innovations for the Wood Industry

woodadhesives.akzonobel.com

Bio-based & Mass Balance Approach

Industries are increasingly seeking more sustainable alternatives to minimize their environmental impact. Traditional wood adhesives often rely on fossil-based chemicals, contributing to carbon emissions.

Adhesives formulated with raw materials derived from bio-based sources generally have a lower carbon footprint and offer comparable performance to conventional options, while supporting sustainability goals.

Our products contribute to a more circular economy and responsible manufacturing by reducing reliance on petroleum-based components. A wide range of sectors, from furniture to construction, need to adopt these solutions to support their environmental ambitions. The shift to bio-based adhesives is a more environmentally considerate option that supports consumer preferences for climate-conscious products.

This brochure presents some examples of our bio-based products, their reduced environmental impact, and their chemical family. We invite you to explore how these solutions can support your sustainability efforts.

Key benefits of adhesives produced with bio-based materials

- Lower **carbon footprint** compared to conventional adhesives
- Reduced reliance on **petroleum-derived chemicals**
- Contribute to more **sustainable manufacturing and to a circular economy**
- Maintain **performance and durability** in industrial applications

Carbon footprint comparisons

The table below provides examples of products with a lower Product Carbon Footprint compared to the mainstream alternative. A significant bio-based** content characterizes these products.

Product	Bio-content** (%)	PCF Reduction from Cradle to Grave (%)*	Technology Type
LignuPro® Nature A201-B60	60%	-75%	UF
GripPro® Nature A011-B50	50%	-54%	MUF
GripPro® Nature A020-B50	50%	-55%	MUF
Adhesive 1247-B52	52%	-56%	MUF
GripPro® Nature A014-B50	50%	-55%	MUF
UF Nature 1110-B50	50%	-67%	UF
LignuPro® Nature Adhesive A367	30%	-6%	PVAc
LignuPro® Nature Adhesive A330	30%	-6%	PVAc

*Versus the Fossil alternative. **C14 and/or mass balanced bio-based.

Frequently Asked Questions about Bio-based and Mass Balanced Approach

The following section provides explanations of the terms commonly used in relation to more sustainable products.

Want to learn more?
Please reach out to your Sales or Technical Service Representative.

Bio-based definitions

Question 1

What is the definition of “bio-based” when you state that the adhesive is manufactured with x% bio-based materials?

Answer:

Bio-based raw materials are renewable materials that are wholly or partly derived from biomass*, which have undergone physical, chemical or biological treatments.

*The term biomass covers all materials of biological origin, apart from fossil materials and/or those incorporated into geological formations. The term therefore applies to plants, trees, algae, marine organisms, microorganisms and animals.

Question 2

What is Product Carbon Footprint?

Answer:

The product carbon footprint (or PCF) is the calculation of all of the greenhouse gas (GHG) emissions generated in the supply chain of a specific product which we express in a combined impact in CO_2 equivalents per kilogram of product.

Question 3

How does bio-content help to reduce the product carbon footprint (PCF)?

Answer:

Compared to fossil materials, bio-based materials absorb CO_2 from the atmosphere when the bio-based material is growing. This leads to an amount of CO_2 being taken out of the air. This negative carbon emission helps to reduce the overall carbon footprint of our materials.

Question 4

What is the difference between fossil resources, renewable resources, bio-based and biogenic carbon, and how are these terms related?

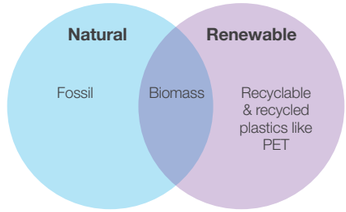
Answer:

Fossil resources are materials made from fossilized plant and animal remnants from millions of years ago. Fossil resources are not renewable, i.e. they are not regenerated in a lifetime. Examples are crude oil and coal.

Renewable resources are regenerated quickly, typically on a life scale of a human lifetime, or can be used circularly.

Bio-based materials are materials of biologic origin derived from renewable sources that have adsorbed CO_2 to grow, like crops and trees.

The fact that these resources are derived from recently living organisms causes these materials to contain **biogenic** carbon, as opposed to fossil carbon atoms that are found in fossil materials.



Question 5

How is the bio-based content defined?

Answer:

The bio-based content is defined as the amount of bio-based organic carbon divided by the total amount of organic carbon, and it is expressed as a percentage.

AkzoNobel Wood Adhesives communicates the bio-based carbon content.

Question 6

Where does the increased industry interest for bio-based come from?

Answer:

Companies aim to reduce their negative impact on the environment, and consumers expect large companies to take action. Bio-based materials can contribute towards sustainability targets by using raw materials with a lower environmental impact and carbon footprint.

Mass Balance and C14

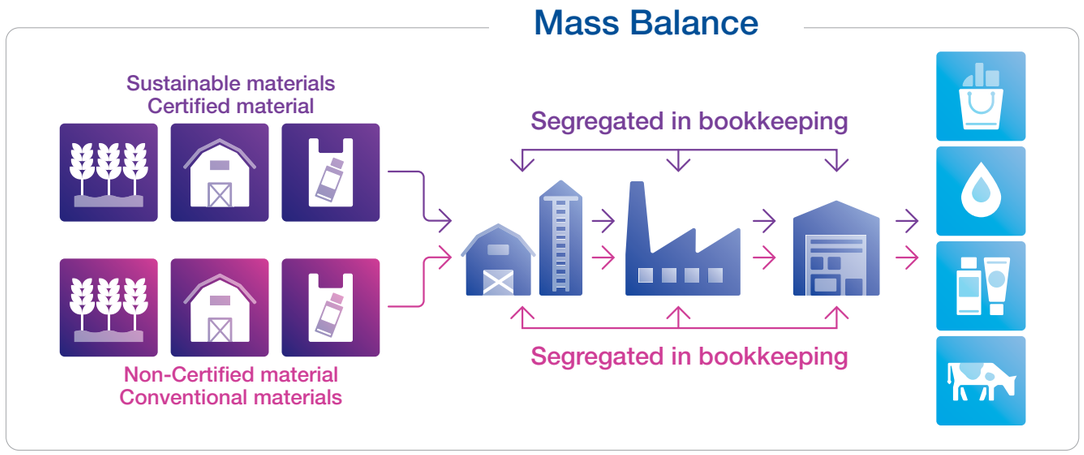
Question 7

What is the mass balance principle?

Answer:

Mass Balancing is a broadly accepted accounting approach designed to allow the manufacturing supply chain to mix sustainable materials with conventional materials, providing traceability of sustainable elements present in their product.

It aims to allow manufacturers to partially replace conventional materials and products with more sustainable alternatives, without establishing new manufacturing processes, as they transition to a fully sustainable approach over time.



Simply put, mass balancing is an approach which supports responsible co-processing of conventional and sustainable materials in common facilities.

Question 8

What is C14? And how is this different to mass balance?

Answer:

Bio-based materials can be distinguished from fossil-based materials by looking at the amount of carbon-14 in the materials. Carbon-14 is an isotope of carbon present in bio-based materials, while in fossil materials it is not detected. By measuring the amount of carbon-14 in a sample, the bio-based content of the sample can be determined.

The C14 measurement is normally carried out according to test method ASTM D6866.

This test makes an absolute and accurate measurement of C14 in a given sample at a given time, while mass balance is an accounting method that ensures an amount of bio-based material is added to a process as a feedstock over a large period of time, enough to satisfy the certified output. It is known from the start that the exact value of biomass balance material claimed for the product is likely not found in a specific sample at a specific time.

Question 9

Why is mass balance needed?

Answer:

To increase the amount of materials based on renewable resources on the market and decrease dependence on depletable (fossil) feedstocks, such as crude oil, the mass balance approach is a complementary step that can be necessary for a fossil-free future.

Mass balance enables the use of bio-based feedstock (biogenic carbon) in intermediates or final products, and subsequent emission savings, where the complexity of the value chains or the level of scale does not yet allow for a fully segregated production.

AkzoNobel's Wood Adhesive portfolio

Question 10

Which AkzoNobel wood adhesive products have mass balance bio-based content?

Answer:

Examples of product with mass balanced bio-content are **GripPro® Nature A011-B50** that has 50% bio-based content and **LignuPro® Nature A201-B60** that has 60% bio-based content.

Question 11

What AkzoNobel wood adhesive products have C14 bio-based content and/or mass balance based bio-based content?

Answer:

Examples of products are:

LignuPro® Nature A201-B60:	Hardener H203:	GripPro® Nature A011-B50:
60% produced using bio-based materials (& extremely low emissions)	45% produced using bio-based materials, for flooring, veneering and curved plywood.	50% produced using bio-based materials (& extremely low emissions) for laminated beams.

These products are examples, we advice customers to contact their AkzoNobel sales representative to discuss what sustainable adhesives are possible for their particular production.

Question 12

Your product name is GripPro® Nature A011-B50. What does the 50 mean?

Answer:

The number after the B is the amount of bio-based organic carbon content, either through mass balance or C14-content, or a combination of both.

Question 13

Are AkzoNobel's mass balanced based bio product certified by an independent entity?

Answer:

Our mass balanced bio-based products are certified by ISCC PLUS. ISCC (International Sustainability & Carbon Certification) is a globally applicable sustainability certification system and covers all sustainable feedstocks, including agricultural and forestry biomass, biogenic wastes and residues, circular materials and renewables.

Question 14

How do I know if the product has bio-content that is mass balance based or C14 based?

Answer:

In our datasheets we explain the method used. You can also see it in the marketing collateral; ISCC PLUS and RedCert are certification schemes for mass balance bio-based materials. USDA certified and OK Bio-based-TUV Austria are examples of C14.

Question 15

How does AkzoNobel ensure the bio-based content doesn't compete with food supply?

Answer:

AkzoNobel sources from non-food type material (ie; wood, agricultural waste) rather than compete with food (ie; sugar, starch, and vegetable oils). With the ISCC PLUS certification we provide external proof of this: the bio raw materials complies with the ISCC Principles 1 – 6 for the cultivation and harvesting of sustainable biomass.

Question 16

What is AkzoNobel's carbon footprint reduction target for 2030 and how does that connect to the Paris agreement?

Answer:

Climate change mitigation is an integral part of our approach to sustainable business and plays an important role in our company strategy. It brings risks, but also creates opportunities. In 2021, we announced an ambitious target of reducing carbon emissions across our full value chain by 50% (absolute) by 2030, taking 2018 as our baseline. This target has been formally approved by SBTi (Science Based Target initiative).

Our ambitions are aligned with the Paris Agreement, which aims to limit climate change and ensure the global temperature doesn't rise more than 1.5°C above pre-industrial levels.

Question 17

How can I start buying AkzoNobel Wood Adhesive bio-based products?

Answer:

Please reach out to your local sales representative

AkzoNobel

About AkzoNobel
Since 1792, we've been supplying the innovative paints and coatings that help to color people's lives and protect what matters most. Our world class portfolio of brands – including Dulux, International, Sikkens and Interpon – is trusted by customers around the globe. We're active in more than 150 countries and use our expertise to sustain and enhance everyday life. Because we believe every surface is an opportunity. It's what you'd expect from a pioneering and long-established paints company that's dedicated to providing sustainable solutions and preserving the best of what we have today – while creating an even better tomorrow. Let's paint the future together.

For more information please visit www.akzonobel.com.

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