

# RENEWABLE RESINS FOR COATING APPLICATIONS



**Corporate Center**  
Frankfurt  
The Squire 13  
Am Flughafen  
D 60549 Frankfurt am Main  
Germany

[www.allnex.com](http://www.allnex.com)





## Facts & Figures

- Global company with over €2.1 billion in sales
- Broad technology portfolio: liquid coating resins, energy curable resins, powder coating resins, crosslinkers and additives, composites and construction materials
- Approximately 4000 employees
- Customers in more than 100 countries
- 33 manufacturing facilities
- 23 research and technology centers
- 5 joint ventures
- Extensive range of solutions for key coating segments: automotive, industrial, packaging coating and inks, protective, industrial plastics and specialty architectural

With manufacturing, R&D and technical facilities located throughout Europe, North America, Asia Pacific and Latin America, allnex offers global and reliable supply of resins and additives combined with local, responsive customer support.

## Table of Contents

This brochure .....	5
Contribution to sustainable change .....	6
Our five pillars for sustainability .....	7
Power coating products.....	8
Radcure products.....	10
Liquid Resins products.....	12
Insights.....	16

## This brochure

Purpose of this brochure is to present the outcome of our efforts within the pillar of renewable sourcing, offering a broad range of resins containing renewable raw materials.

The bio-based carbon content values listed in this brochure are calculated. Values marked with C14 are bio-based carbon content measurements according to ASTM D6866. Please note, that there can be a slight

variation of these values by batch.

We also offer products with an increased bio-based content via the Mass Balance approach. For these products the use of a corresponding amount of biomass in the supply chain is guaranteed. The C14 in each batch can be variable, however rigorous accounting allows you to claim the CO<sub>2</sub> savings associated with the biomass allocated to the product.

### The brand names included in this brochure:

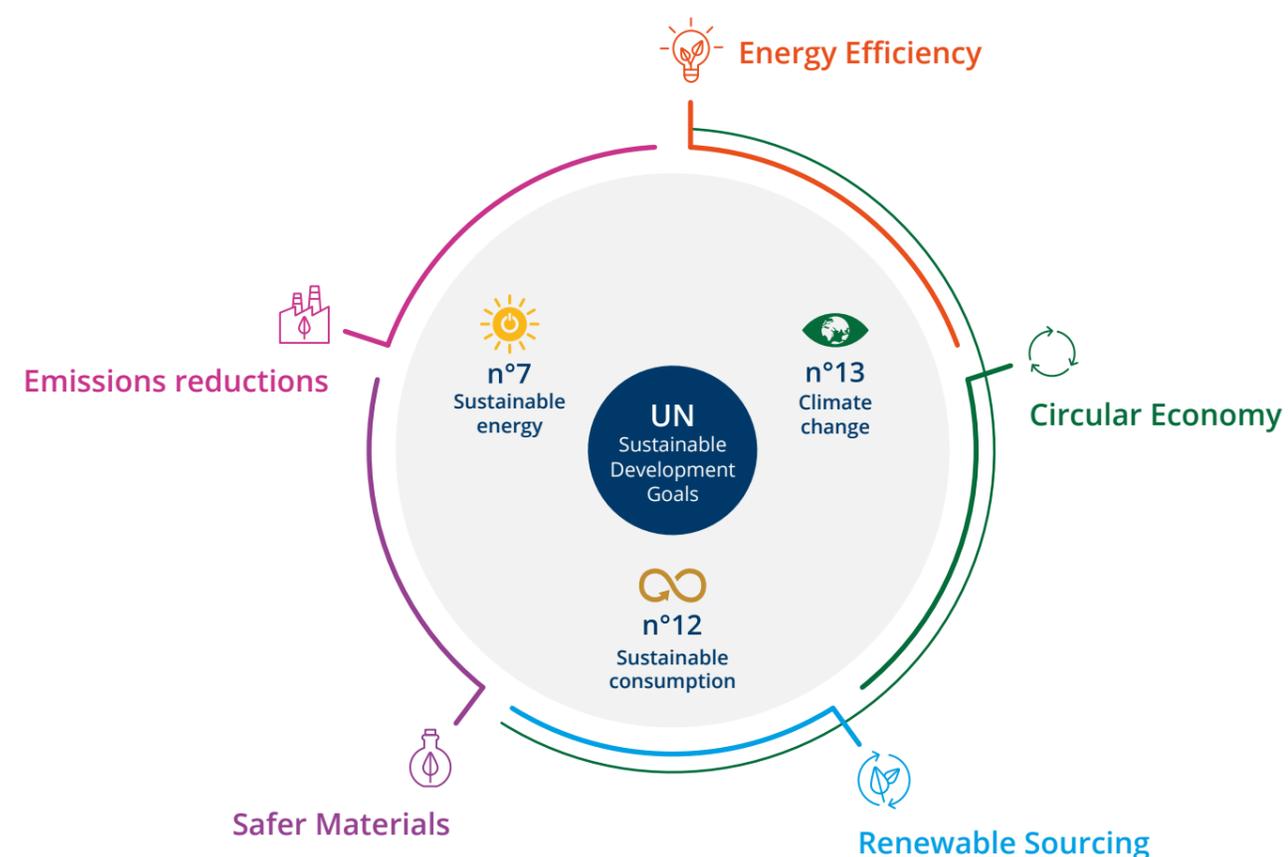
Epoxy dispersions	BECKOPOX™
Polyurethane dispersions	DAOTAN®
Epoxy ester resins	DUROXYN®
Curable resins	EBECRYL® UV/EB
Alkyd resins	RESYDROL®
	SETAL®
	SETYRENE™
	SETAQUA®
	SETATHANE®
	CRYLCOAT®
	RAYLOK®
	UCECOAT®



## Contribution to sustainable change

As the leading industrial coating resins company, sustainability is a key part of our continued success and commitment to our stakeholders. We embrace this responsibility and stay focused and dedicated to pursuing a more sustainable future together with our customers. With our broad portfolio of technologies and sustainable focus, we are your ideal partner to smoothly and successfully make the transition to eco-friendly solutions.

We are committed to contributing to the achievement of the United Nations Sustainability Development Goals (UNSDG). While we are set on taking further action by implementing and further developing initiatives for all the UN Development Goals, we are already able to make a significant impact in three key areas with existing measures and processes we have in place, focusing on five eco pillars:



## Our five pillars for sustainability

We aim at improving our performance in terms of sustainability by taking action on five high priority areas, both from a product and process standpoint. This underlines our commitment to deliver quality, eco-friendly and safer products to our customers, as well as doing the right thing for the planet as a company.

### Energy Efficiency

We design our product and manufacturing process to achieve the highest efficiency in energy utilization across the product lifecycle.

### Circular Economy

We explore options to limit resources consumption, keep them in use as long as possible, and finally recover and recycle them at the end of service life.

### Renewable Sourcing

We aim at minimal use of finite resources and reduce the impact on climate change by looking at renewable alternatives for raw materials and energy we use.

### Safer Materials

We are committed to making the substitution of potentially harmful chemicals with safer options one of our top priorities.

### Air Emissions

We focus on reducing emissions of Volatile Organic Solvents across the product lifecycle to protect people and the environment.

## Powder Coating Resins

Product	Glass Transition T [°C]	Viscosity at 200 °C [mPa.s]	Bio-based carbon content (%)	Application	Product description
CRYLCOAT® E 04342	60	6000	23	General metal	70:30 Hybrid resin based on renewable & recyclable raw materials curing 10 mins at 180°C; good mechanical properties, outstanding ageing stability and blooming resistance.
CRYLCOAT E 04367	59	4000	23	General metal	95:5 Primid industrial application exterior grade resin based on renewable & recyclable raw materials curing 10 mins at 180°C; good mechanical properties and flow, outstanding ageing stability.



## Liquid Resins

Product	Non Volatile (%)	Viscosity (23°C, Pa.s)	Bio-based carbon content on supply form (%)	Bio-based carbon content on solid resin (%)	Application	Product description
<b>Solvent borne Alkyd Resins</b>						
SETAL® 118 XX-60	60	5.2	32	60	Wood acid cure, primer, stoving	Good hardness, scratch resistance, adhesion and impact resistance, good gloss retention, very good durability, excellent pigment wetting properties.
SETAL 142 XX-60	60	3.7	17	32	Primer, air drying	Very fast drying, good elasticity and yellowing resistance (also at elevated temperature), good adhesion on steel.
SETAL 199 SS-55	55	7.6	27	54	Industrial Metal, vehicle refinish	Good drying properties, very good body, good color, gloss retention and exterior durability.
SETAL 270 SM-70	70	5.5	45	69	Wood external trim	Good color fastness, brushability, body and flow, good durability.
SETAL 293	99	1.0	84	85	Wood external trim	Very good brushability, leveling, filling, high gloss, low yellowing tendency and good through hardening. Suitable as reactive diluent.
SETAL 301 SM-83	83	4.8	57	71	Wood external trim	Excellent durability and drying. Minimal yellowing.
SETAL 312 SM-88	88	7.5	58	68	Wood external trim	Excellent outdoor durability and very low yellowing in the dark. Largely based on renewable raw materials. Contains ISCC PLUS certified raw materials.
SETAL 321 SM-75	75	6.0	51	71	Wood external trim	Additive resin to improve solids, abrasion and chemical resistance. Good drying and hardness.
SETAL 707 BA-75	75	5.0	42	53	Wood acid cure	For high solids acid catalyzed and nitrocellulose systems.
SETAL 84 XX-70	69	5.1	9	13	Primer, stoving	Very good durability, excellent color and gloss retention, high body. Suitable for acid catalyzed, nitrocellulose, two-component and stoving systems.
SETAL A F 26 X	60	2.5	15	28	Metal	Very rapid drying and curing, high resistance to yellowing, good weather stability and good anti-corrosion properties.
SETAL A F 48 TB/X	55	5.4	26	50	Primer, monocoat, topcoat, air drying	Fast drying, good through-drying and curing to form defect-free films, even in thick coats. Good yellowing resistance, gloss and good gloss retention. Good weather stability.
SETAL A U 601 HV TBA	51	2.9	31	71	Industrial metal, flooring - wood & surfaces	Good hardness and flexibility, high resistance to wear and abrasion, good resistance to water and household cleaning agents.
SETAL A U 601 TB	55	1.2	34	67	Wood external trim	Rapid drying, excellent hardness, high abrasion resistance and good long-term flexibility.
SETYRENE™ 78 XS-55	55	1.0	10	18	Topcoat, air drying	Fast drying, good pigment wetting properties, good compatibility.
<b>Waterborne Alkyd Resins</b>						
SETAQUA® 6006	52	0.35	26	26	Industrial wood, primer, topcoat, air drying	Fast drying, wood penetration and corrosion resistance.
SETAQUA 6004 YA	45,5	145 cPa.s	35	35	Industrial wood, primer, topcoat, air drying	Fast drying, wood penetration, Water borne and yellowing resistance.
SETAQUA 6407	26	4.4	8	10	Automotive OEM, industrial metal, vehicle refinish.	Pigment dispersing resin that provides good pigment wetting, good stabilization of aluminium pigments, improved film forming and flow.
SETAQUA PU F106	35	1	47 <sup>c14</sup>	47 <sup>c14</sup>	Flooring, furniture, industrial wood, metal, masonry.	Flooring, furniture, industrial wood, metal, masonry.
<b>HPO</b>						
SETATHANE® D 1160	100	1	80	80	Flooring	Flexibility, lower hardness, retaining mechanical strength, elastomeric nature.
SETATHANE D 1150	100	3.5	77	77	Flooring	Tough yet flexible. Hard-wearing and chemical resistant.
SETATHANE D 1156	100	1.1	63	63	Flooring	A reactive diluent for combination with e.g. SETATHANE D 1145, SETATHANE D 1150 and SETATHANE D 1160 in the formulation of 2-pack PU formulations and coatings to modify physical and mechanical properties.
SETATHANE D 1145	100	3	64	64	Flooring	Tough, hard-wearing, higher chemical resistance.
SETATHANE D E 2761	70	0.3	72	73	Flooring	Resistance to organic and inorganic acids, alkalis and solvents. Thermal shock resistant.
SETATHANE D E 2656	70	0.3	87	88	Flooring	Resistance to organic and inorganic acids, alkalis and solvents. Higher flexural strength.
SETATHANE D E 2767	90	1.2	53	54	Flooring	Resistance to organic and inorganic acids, alkalis and solvents. Can be used for primers.

<sup>c14</sup> Measured bio-based carbon content

<sup>MB</sup> Part of the bio based content is on Mass Balance



Product	Non Volatile (%)	Viscosity (23°C, Pa.s)	Bio-based carbon content on supply form (%)	Bio-based carbon content on solid resin (%)	Application	Product description
<b>Waterborne Alkyd Resins</b>						
RESYDROL® AF 502w/35WA	35	1.6	48	48	Monocoat, topcoat stoving	High body, no organic co-solvent, pigment wetting.
RESYDROL AM 224w/40WA	40	5	21	22	Auto OEM primer surfacer	Balance of hardness and elasticity.
RESYDROL AM 420w/66BPWA	66	2	33	40	Primer, topcoat, monocoat stoving	Adhesion, balanced hardness and flexibility, corrosion resistance.
RESYDROL AX 237w/70BG	70	11	26	35	Primer, air drying	Humidity and Corrosion resistance.
RESYDROL AX 246w/70BG	70	16	17	24	Primer stoving	Dipping paints. Combined with CYMEL® 303 LF - offers corrosion resistance.
RESYDROL AX 247w/70BGMP	70	13	17	24	Stoving coatings	Electrical insulation paints.
RESYDROL AX 250w/75EP	75	0.5	17	23	Primer stoving	Dipping paints. Combined with CYMEL 303 LF - offers corrosion resistance.
RESYDROL AY 466w/38WA	38	7	42	48	Topcoat, air drying	Humidity resistance. High gloss. Fast drying.
RESYDROL AY 586w/45WA	45	7.5	57	58	Wood external stain	Adhesion and penetration on wood, open time and durability.
RESYDROL AY 6150w/45WA	45	0.8	33	34	Primer, topcoat, monocoat, air drying	Humidity and corrosion resistance. High gloss. Easy application.
RESYDROL AY 6705w/44WA	44	0.6	37	37	Wood external stain	Durability, fast drying, suitable for vertical and horizontal wood applications.
RESYDROL AZ 6191w/42WA	42	1.4	42	43	Metal, wood internal & external trim	Suitable for wood and metal applications, gloss, flow, leveling and chemical resistance, durability.
RESYDROL AZ 6710w/41WA	41	0.7	33	33	Wood external stain	Durability, fast drying, suitable for all types of wood.
RESYDROL AZ 6711w/40WA	40	4	42	42	Wood external stain	Very hard, quick drying grade for wood applications, mostly used as a blending resin.
RESYDROL VAF 6111w/60WA	60	0.5	40	40	Interior wall paint	Blending partner for acrylic applications to improve adhesion and applicability with low yellowing.
RESYDROL VAL 5547w	98	1.3	70	70	Wood impregnation	Penetration on wood, low grain rising and oil feeling application.
RESYDROL VAY 6096w/39WA	39	5	29	33	Topcoat, air drying	Humidity resistance. Fast drying.
RESYDROL VAS 6110w/68WA	68	1.3	67	67	Wood external stain	Penetration on wood.
SETAQUA® 6006	52	0.35	26	26	Industrial wood, primer, topcoat, air drying	Fast drying, wood penetration and corrosion resistance.
SETAQUA 6004 YA	45.5	145 cPa.s	35	35	Industrial wood, primer, topcoat, air drying	Fast drying, wood penetration, Water borne and yellowing resistance.
SETAQUA 6407	26	4.4	8	10	Auto OEM, basecoats	Good pigment wetting, good stabilisation of alu pigments, improves film forming and flow.
<b>Waterborne Acrylic Resins</b>						
RESYDROL® SF 8000/50WA	50	0.7	6	6	Interior trim	Drier free, good brushability, nice body, flow and leveling, ADH and surfactant free.
RESYDROL SF 8010/50WA	50	0.5	6	6	Wood external stain	Fast drying, drier free, excellent durability, no peeling, flaking or grain rising, ADH and surfactant free.
RESYDROL SF 8011/50WA	50	0.5	6	6	Wood external stain	Harder version of RESYDROL SF 8010.
<b>Waterborne Epoxy Ester Resins</b>						
DUROXYN® VAX 6127w/42WA	42	1.6	29	34	Primer, air drying	Corrosion resistance.
<b>Waterborne Polyurethane Dispersions</b>						
DAOTAN® TW 1252/42WA	42	1.3	31	33	Topcoat, monocoat, air drying	High gloss, hardness.
DAOTAN TW 6440/43WA	42	1.8	37	39	Industrial wood	Behaves like a solvent borne system, quick hardness development and chemical resistance.
<b>Waterborne Epoxy Dispersions</b>						
BECKOPOX™ EM 2120w/45WA	45	0.5	7	8	Monocoat (DTM) air drying	Anti corrosion performance close to 2K epoxy.
BECKOPOX EP 2384w/57WA	57	0.8	6	6	Monocoat (DTM) or primer air drying	Hardness development, early water resistance.

Product	Functionality	Viscosity cP @ 25 °C	Bio-based carbon content (%)	Application	Product description
<b>Monomers</b>					
I BOA	1	10	77	Graphics/Industrial Coatings	Monomer with high diluting power, recommended where flexibility and high Tg need to be combined.
OTA 480	3	90	14 <sup>c14</sup>	All	It exhibits low viscosity and good flexibility for a triacrylate and its high functionality contributes to good reactivity and hardness.
<b>Epoxy Acrylates</b>					
EBECRYL® 3608	2	70000	20	Inks	Fatty acid modified epoxy acrylate recommended for ink formulations where improved pigment wetting is demanded.
EBECRYL 3700	2	4300 @ 60°C	23	Graphics/Industrial Coatings	Exhibit high reactivity, surface hardness and gloss and the excellent solvent resistance typical of an epoxy resin.
EBECRYL 3700/180T	2 + 3	85000	21	Graphics/Industrial Coatings	This resin is characterized by its low odor, light color, low irritancy and very fast cure response.
EBECRYL 3702	2	900000	20	Litho Inks	Fatty acid modified epoxy acrylate recommended for ink formulations, good litho behavior and very good pigment wetting.
EBECRYL 5848	3	25000	84 <sup>c14</sup>	Litho Inks	Epoxidized Soya Oil Acrylate. BPA-free product. Good for Hot foil stamping.
EBECRYL 6000	2	3000 @ 60°C	22	Graphics/Industrial Coatings	Exhibit high reactivity, surface hardness and gloss and the excellent solvent resistance typical of an epoxy resin.
<b>Polyester Acrylates</b>					
EBECRYL 450	6	8600	37 <sup>c14</sup>	Flexo inks	Polyester acrylate which gives excellent pigment wetting and high reactivity.
EBECRYL 452	4	600	34	Flexo inks	Polyester acrylate with excellent pigment wetting; enables the production of high concentrated pastes, increasing productivity and process flexibility.
EBECRYL 657	4	125000	54 <sup>c14</sup>	Offset inks	Polyester acrylate with good pigment wetting, ink water balance and misting properties.
EBECRYL 820	6	550	23	Flexo inks for indirect food contact packaging	Low migration product; exceptional pigment wetting allows preparation of highly concentrated pigment pastes.
EBECRYL 846	6	45000	29	High speed Offset inks	Polyester acrylate which gives high reactivity and low misting.
EBECRYL 870	6	48000	30	Offset inks	Polyester acrylate which gives excellent pigment wetting and high reactivity. Good litho behavior.
EBECRYL 5849	2	6000	56 <sup>c14</sup>	Litho Inks	High reactivity and high Tg; can be used for BPA-free development in Graphics and Wood Applications.
EBECRYL LEO 10801	6	45000	30	Inks for indirect food contact packaging	Hexfunctional polyester acrylate oligomer that provides high reactivity and the proper ink-water balance necessary for good lithographic printing.
EBECRYL R1872		7000	11 <sup>c14</sup> (and 21% Recycled PET)	Industrial Coatings	Good adhesion, balanced flexibility/reactivity, good abrasion/grit feeder resistance. Recommended for use in sealers and topcoats in wooden flooring and furniture applications.
<b>Specialty Oligomers</b>					
EBECRYL 767	1	175000	30	Industrial Coatings	Excellent primer for difficult substrates.
EBECRYL 1300	1	10000	54-56	Packaging Coatings and Inks	Good adhesion promoting properties. Excellent flexibility, high gloss and light color.
RAYLOK® 1622	3	520	25	Industrial Coatings	Low viscosity natural oil modified oligomeracrylate. It gives a transparent oil-like natural and warm aspect.
<b>Urethane Acrylates</b>					
EBECRYL 242N	2	21000	29	Industrial Coatings	Flexible coating for metal substrates, good adhesion and excellent flexibility. Tin-free.
EBECRYL 4491	2	60000	20-24	Industrial Coatings	Elastomeric grade, extremely flexible, elongation at break over 250%. For temporary protective coatings, improves elasticity in combination with hard resins.
EBECRYL 4683	2 + 1	50000	30-32	Industrial Coatings	Extremely tough. Low shrinkage during curing, good adhesion to plastic and metal, outdoor resistance.
EBECRYL 4690	> 4	29000	30 <sup>c14</sup>	Industrial Coatings	Excellent weathering resistance for exterior applications. Multi-substrate adhesion, low yellowing and high reactivity. Improved chemical and abrasion resistance.
<b>UV PUD</b>					
UCECOAT® 7998	n/a	<100	46 <sup>c14</sup>	Industrial Coatings	UVPU for performance-in-use in clear and white coating applications. The product combines low MFFT and immediate hardness after cure.
UCECOAT 7999	n/a	<200	22 <sup>c14</sup>	Industrial Coatings	High-performance tin-free and low-MFFT aqueous binder for clear and white pigmented coating on wood. The cured coating develops an immediate optimum hardness not requiring oxidative drying.

<sup>c14</sup> Measured bio-based carbon content  
<sup>MB</sup> Part of the bio based content is on Mass Balance



## Insights

Renewable materials are materials that can be manufactured from renewable resources, e.g. resources that replenish fast enough to keep pace with how fast they are used up, either through biological reproduction or other naturally recurring processes. The term 'bio-based materials' is generally used for materials wholly or partly derived from biomass. This does not imply the resource is quickly replenished, but rather that it has the potential to be.

### Value of using bio-based materials

Bio-based products have the benefit of containing in them carbon extracted from the atmosphere during plant growth, instead of fossil carbon. This contained carbon can have a neutral effect on the end-of-life emissions of a product, which can be a significant gain for the total greenhouse gas (GHG) emissions of a product life cycle.

### Sustainability

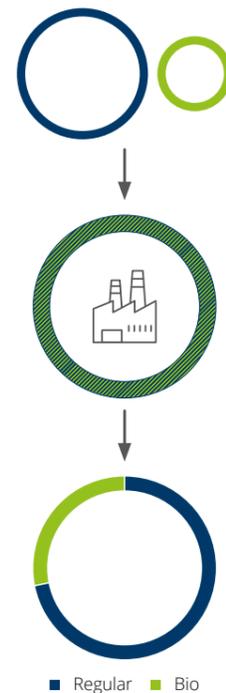
Sustainability is difficult to measure. But there are some indications that a product has improved sustainability value – good water, soil and air protection practices used in the biomaterial production, safe working conditions, good management practices as well as low GHG emissions and many more. These are what sustainability certifications, like ISCC PLUS, REDcert2, Roundtable on Sustainable Biomaterials and others verify. Currently, the products available "on Mass Balance" are produced using raw materials with such certification.

### Mass Balance

As a way to effectively transition to bio-based and sustainable products the industry can use a chain-of-custody method called Mass Balance. In this approach alternative materials are introduced into the production process mixed with conventional materials and allocated to finished products. With this method certifiable claims can be attributed to products while avoiding the financial and environmental costs of creating dedicated infrastructure.

### Sustainable sourcing

We are adopting a responsible sourcing vision to develop our new renewable products, including considerations on issues such as competition with food, land use and impact on local communities in materials selection. We target whenever possible sourcing from second generation feedstock, as byproducts/residues from forestry, agriculture, industry or waste streams, and we evaluate sources that use regenerative agricultural and forestry practices.



### Declarations

We will provide an allnex declaration of the bio-based content or sustainability properties of our products based on our supplier's statements and our internal auditing.

We can provide the amount of contained bio-based carbon of our products from which the corresponding CO<sub>2</sub> uptake during crop growth can be calculated. This value is relevant when calculating the full lifecycle carbon footprint.

### Verification

We will run C14 control measurement at a third party institute for materials supplied with a C14 certification. For materials supplied with a biomass certificate, we fully rely on our vendor certifications.

### Glossary

**Bio-based carbon content** is the ratio of bio-based carbon / total carbon. It can be measured according to ASTM D6866, EN 16640 or ISO 16620-2.

**Contained carbon** or **embedded carbon** is the same as the total carbon in the product. The bio-based part is counted as neutral in end-of-life carbon footprint calculations.

**Atmospheric CO<sub>2</sub> uptake**, in the context of bio-based materials, is the amount of CO<sub>2</sub> that has been extracted from the atmosphere by biological processes and is contained in the biomass. It is stoichiometrically calculated from the amount of bio-based carbon contained in a material.

**Carbon footprint** of a product is the CO<sub>2</sub> equivalent of GHG emissions created throughout the entire life cycle of a product.



