# Bio-based building blocks for coating formulations

SELECTION OF INDUSTRIAL PRODUCTS AND SUPPLIERS

COOCK+ ADDBIO

DELIVERABLE D3.1

30/07/2026

# Content

1. Epoxy Coatings
2. Polyurethane Coatings
3. Acrylate Coatings
4. Alkyd Coatings

# Epoxy coatings

innovation forward

# Amroy Europe Oy. (Finland)

BIO-BASED BPA EPOXY GRADE FOR COMPOSITE FABRICATION

Our latest innovation is Epobiox – liquid epoxy system 70% made from industrially grown and harvested natural oils like, for example, epoxidised pine oil waste. It is suitable for infusion, laminating and especially for glue.

Résine époxy de stratification bio-sourcés EPOBIOX 400 en kit (base + durcisseur)

Résine époxy bi-composant à base d'huile de Pin et autres bio polymères, non chargée et sans diluants Bio sources entre 60 et 85 % suivant les formulations, résine de couleur transparente jaune, durcisseur couleur ocre. Cette résine est sans odeurs et sans solvants. Grande résistances mécaniques et chimiques ainsi qu'une très bonne tenue en milieu humide.




FICHE TECHNIQUE SANDTECH

**RESINE EPOXY BIOSOURCES EPOBIOX STR**

**DESCRIPTION**

EPOBIOX STR est un système époxy liquide sur-mesure pour l'industrie des composites.

elle est adaptée a la stratification, l'infusion et les procédés par collages.

EPOBIOX STR contient jusqu'à' à 70% de résines biosources dans sa composition provenant d' huiles naturelles comme par exemple des déchets d'huile de pin.
Nos résines naturelles ont une teneur en groupes hydroxyles exceptionnellement élevé en polymères et poids moléculaire.
Il en résulte un allongement à la rupture exceptionnelle et une bonne adhésion à tous les types de substrats.

**APPLICATIONS**

Pré mélanger les 2 produits séparément.
Mélanger la résine avec durcisseur correctement minimum 1 - 2 min.

Le produit polymérise, même à température ambiante, mais une température plus élevée donne une meilleure polymérisation et propriétés mécaniques plus élevés.

Plus la température de la résine est élevé (Si possible préchauffer le composant de résine à 30 - 40 ° C avant utilisation) mieux flux et le mouillage sera atteints.
Laissez dégazé 2 a 5min. (Utilisez une pompe a vide si possible).

Traitement thermique recommandée à 80 ° C.
Le système peut être épaissie avec de l' Aérosil pour la stratification des surfaces verticales.

**CARACTERISTIQUES DE LA RESINE A L'ETAT LIQUIDE**

**Viscosité de résine (23 °C)** 1500 – 1200 mPa·s Viscosity

**Viscosité de résine(40 °C)** 600 – 800 mPa·s

**Densité** 1.0 – 1.1 g/cm3

**Flash point** >100 °C

SANDTECH

# Entropy Resins / Wessex Resin

BIO-EPOXY RESINS WITH VARIOUS BIO-BASED CONTENTS

**ONE** High Biobased Laminating Epoxy Resin




Our highest bio-based content system, great for composite and coating applications.

Popular Uses




**Specifications**

| Resin / Hardener | Mix Ratio by Volume | Mix Ratio by Weight | PROCESSING DATA: Mixed Viscosity (mPas @ 25°C) | Pot Life (min @ 25°C) | Tack Free (hr @ 25°C) | Recommended Full Cure |
|---|---|---|---|---|---|---|
| **FAST** | | | | | | |
| ONE | 2 | 100 | 1020 | 18 | 3 | 7 days @ 25°C |
| ONF | 1 | 43 | | | | |
| Key Features | ▸ **USDA BioPreferred Certified**, High Elongation, Slight Amber Colour | | | | | |
| Applications | ▸ General Laminating/Adhesive/Coating System, Hand Layup | | | | | |
| **SLOW** | | | | | | |
| ONE | 2 | 100 | 1060 | 43 | 8 | 7 days @ 25°C post cure recommended |
| ONS | 1 | 43 | | | | |
| Key Features | ▸ **USDA BioPreferred Certified**, High Elongation, Slight Amber Colour | | | | | |
| Applications | ▸ General Laminating/Adhesive/Coating System, Hand Layup | | | | | |

| Product | Omschrijving | Viscositeit (bij 25°C) mPas | Potlife (bij 25°) min | Tg(°C, DSC) | Biocontent (% ASTM D6866) | Kleur | |
|---|---|---|---|---|---|---|---|
| Super Sap CLR | Heldere epoxyhars voor lamineren, coatings en lijmapplicaties. Ontlucht gemakkelijk voor een strakke finish. UV stabiel. | 725 | 18-43 | 65 | 17- 25 | Transparant | |
| Super Sap INF | Supertransparante hars, geschikt voor infusie en RTM, UV stabiel. | 490 | 30 | 76 | 19 | Transparant | |
| Super Sap INS | Supertransparante bio epoxiehars, laag visceus, geschikt voor infusie en RTM. UV stabiel. | 280 | 90 | 48 | 18 | Transparant | |
| Super Sap One | USDA BioPreferred bio epoxie met een zeer hoge biocontent, geschikt voor handlamineren en vacuumbagging. | 600 | 15-20 | 60 | 31 | Amber transparant | |
| 1800ECO | Een structurele epoxy met zeer hoge mechanische eigenschappen en een zeer hoge bio-content, geschikt voor infusie. | 258 | 115 | 94 | 37 | Transparant | |
| 1070ECO | Kristalheldere en UV bestendige lamineerhars en topcoat. Perfecte benatting en levelling. | 700 | 31 | 74 | 37 | Transparant licht-paars | |

| | ONF FAST | ONS SLOW |
|---|---|---|
| **MECHANICAL DATA** | | |
| Tensile Modulus (ASTM D638) | 385,000 psi (2.7 GPa) | 468,000 psi (3.2 GPa) |
| Tensile Strength (ASTM D638) | 7,720 psi (53.2 MPa) | 9,800 psi (67.6 MPa) |
| Elongation (ASTM D638) | 6% | 6% |
| Flexural Modulus (ASTM D790) | 362,000 psi ( 2.5 GPa) | 430,000 psi (3.0 GPa) |
| Flexural Strength (ASTM D790) | 11,910 psi (82.1 MPa) | 14,580 psi (100.5 MPa) |
| Compression Strength (ASTM D695) | 11,300 psi (77.9 Mpa) | 12,520 psi (86.3 MPa) |
| Tg Ultimate (DSC, midpoint) | 146ºF/63ºC | 128ºF/53ºC |
| Hardness (Shore D) | 70-80 | 70-80 |
| **PROCESSING DATA** | | |
| Mix Ratio (by volume) | 2:1 | 2:1 |
| Mix Ratio (by weight) | 100:43 | 100:43 |
| Viscosity (A/B/Mixed @ 77ºF/25ºC) | 1870/120/1020 | 1870/140/1060 |
| Component Density (specific density @ 77ºF/25ºC) | 1.14 (resin), 0.98 (hardener) | 1.14 (resin), 0.98 (hardener) |
| Mixed Density (specific density @ 77ºF/25ºC) | 1.09 | 1.08 |
| Pot Life (@ 77ºF/25ºC) | 18 min | 43 min |
| Tack Free Time (@ 95ºF/35ºC) | 3 hrs | 8 hrs |
| Recommended Full Cure | 7 days @ 77°F/25°C | 7 days @ 77°F/25°C Post cure recommended |
| **ENVIRONMENTAL DATA** | | |
| VOC Content (ASTM D2369) | 0.17 lbs/gal (21 g/L) | 0.06 lbs/gal (7.70 g/L) |
| Mixed Biobased Carbon Content (ASTM D6866) | 28% | 21% |

Biobased = CLA resin + CLF hardener mixing ratio 2:1 (bisphenol-epoxy oligomer + amine)

Room temperature curing 1 to 2 days at 20°C

ONE High Biobased Laminating Epoxy is the industry leader for USDA BioPreferred[SM] certified, ambient cure, laminating epoxy systems. Based upon our original Super Sap® 100/1000 formula, this new system features a faster speed, lowered viscosity, and includes quick air-releasing proper-ties ideal for fiber-reinforcement composite laminations and coatings. ONE High Biobased Laminating Epoxy is a Super Sap® Formulation designed to achieve an excellent balance of high-performance and industry-leading, renewable, biobased content. Yellow in color.

Available in Fast (ONF) and Slow (ONS) High-Biobased Laminating Hardener cure speeds.

innovation forward

https://entropyresins.com/product/one-high-biobased-laminating-epoxy/

# Gurit



## AMPRO™ BIO

### BIO-BASED EPOXY MULTIPURPOSE SYSTEM

- For bonding, laminating & filling wood & GRP
- Accredited 40-60% bio-based system
- 3 : 1 mix ratio by volume
- Available with Fast, Slow and Extra-slow blendable hardeners
- No surface residue after cure

Cured Resin Colour

https://www.gurit.com/AMPRO#ampro-bio

| PRODUCT DESCRIPTION | STATUS | CERTIFICATION |
|---|---|---|
| AMPRO™ BIO Resin | The product is assigned to class 2 meaning 40% ≤ Biobased Carbon content of the product.. < 60% ★★ | TA8071903328 |
| AMPRO™ Fast Hardener | The product is assigned to class 1 meaning 20% ≤ Biobased Carbon content of the product.. < 40% ★ | TA8071903329 |
| AMPRO™ Slow Hardener | | TA8071903996 |
| AMPRO™ Extra-slow Hardener | | TA8071903997 |

| SYSTEM PROPERTIES AT 25°C | | MIXED VISCOSITY* | 150g POT-LIFE* | TACK-OFF TIME* | EARLIEST SANDING TIME* |
|---|---|---|---|---|---|
| AMPRO ™ BIO Resin | Product Information, Instructions for Use and Health & Safety | | | | |
| | AMPRO™ Fast Hardener | 1260 cP | ½ hour | 2 ¾ hours | 16 hours |
| | AMPRO™ Slow Hardener | 1100 cP | ¾ hours | 4 ½ hours | 20 hours |
| | AMPRO™ Extra-slow Hardener | 1050 cP | 1 hours | 6 hours | 20 hours |

**AMPRO™ BIO is a simple to use, all-purpose epoxy which can be used for gluing, coating, laminating and filling. With its fast, low temperature curing hardener and easy 3:1 mix ratio by volume, AMPRO™ BIO provides a quick and convenient way of using one epoxy system for a very wide range of tasks.**

AMPRO™ BIO has been built on the well-established SP 106 which has been the primary epoxy system for the manufacture and repair of wooden boats for over 20 years.

By using the Gurit range of filler powders, an AMPRO™ BIO resin and hardener mix can be turned into a very effective adhesive or filling compound. Details of this filler range, and how to use them, are contained in a separate information sheet (Filler Guide) and typical filling and fairing mixes (resin / hardener / filler) are shown in this data sheet.

### COATING

**If exposed to sunlight the product should be painted or coated with a varnish which includes UV filter or blockers.**

Prior to this, two coats of AMPRO™ will achieve a stable substrate. AMPRO™ has a number of benefits, including:

- Subsequent coats of AMPRO™ can be applied after just 5 hours at 20°C without sanding
- AMPRO™ is solvent-free and will be fully hardened overnight ready for over-coating or top-coating

The surface to be coated should be dry and clean, before sanding with 180 – 220 grit sandpaper to generate a key, the surface should then be wiped with solvent to remove the dust before the application of the AMPRO™.

For best results, an initial thin coat of AMPRO™ should be applied to the substrate, using a rubber squeegee or brush to remove any excess. If the first coat of AMPRO™ is too thick, this can cause 'fisheyes' to form in the surface. Once the first coat has cured, subsequent coats of AMPRO™ can be applied. Due to the 4 day overcoating window of AMPRO™ (@ 20 degree C 50% RH), the surface does not require sanding between coats to ensure adhesion. If left for more than 4 days, the surface should be sanded with 120 grit sandpaper followed by a solvent wipe down to remove the dust before applying additional coats.

### Coating with AMPRO™ – Defect Inspection

Check for defects once a **third of the over-coating time** has passed

This will depend on the **hardener speed** you are using and the ambient temperature

As a rough guide at **20 °C**, a third will be:

* fast hardener = 20 minutes
* slow hardener = 30 minutes
* extra-slow hardener = 40 minutes

Remember that the over-coating time will also vary according to the **coating thickness**

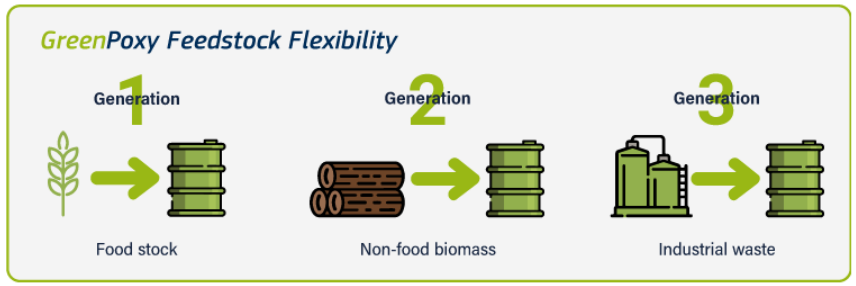


https://www.youtube.com/watch?v=z8eRn4olxFg&t=2s

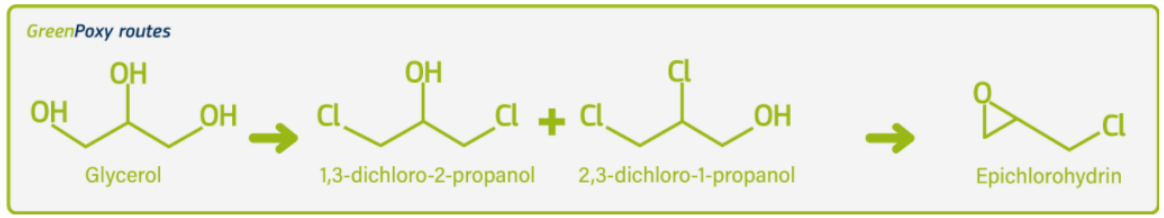
innovation forward

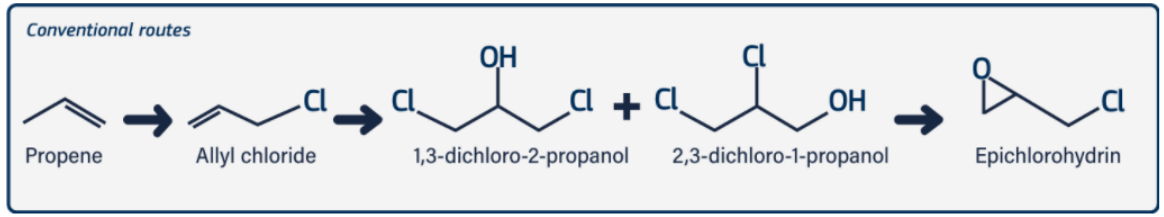
# Sicomin

BIO-BASED EPICHLOROHYDRIN




GreenPoxy systems are obtained from 3rd generation bio-based glycerol (oleochemical wastes). Sicomin is focused on using the most abundant bio-based raw material available, but we are also conscious of the need to be as sustainable as possible.







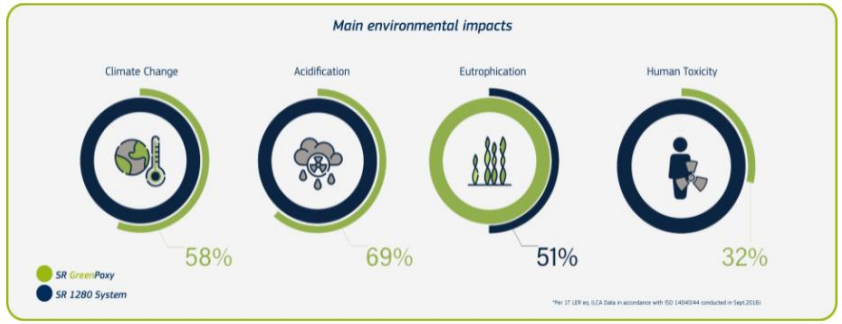
## SR GreenPoxy 56
### Clear epoxy resin

## Adaptation to processing requirements




## Main results

The followings results (Tab 3: Main environmental impacts) were obtained with OpenLCA 1.5 software, eco-invent 3.2 database, CML calculate-methods. No normalization reference impact category results were used.



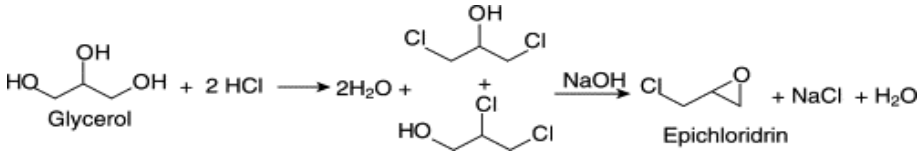

innovation forward

https://sicomin.com/epoxy-materiaux-composites/epoxy/gel-coat/sg-greencoast-incolore/

https://greenpoxy.org/

# Solvay

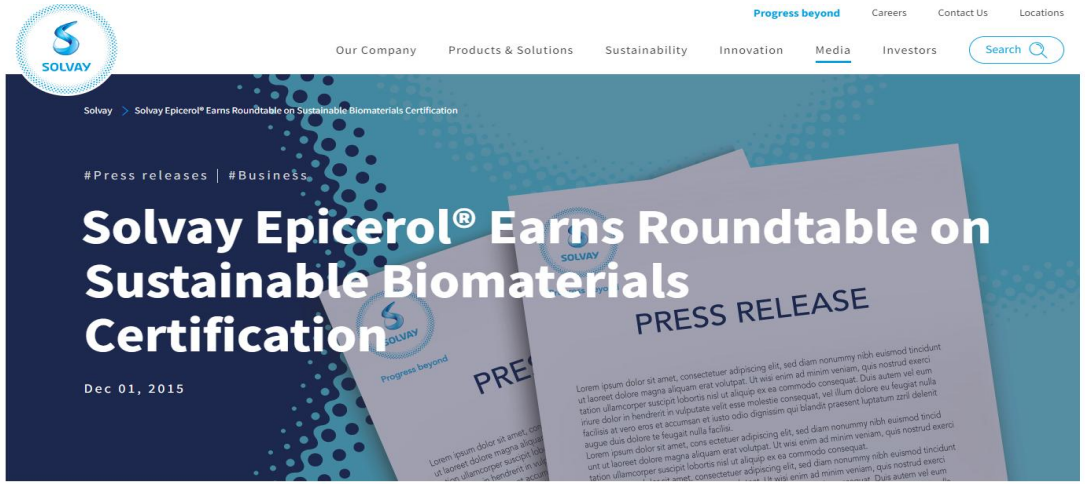
## BPA-FREE EPICHLOROHYDRIN FOR EPOXY RESINS




Large epoxy resin suppliers, Olin Corporation, Eastman, BASF, Huntsman are starting to offer BPA free epoxy resins but the market share remains limited since other resins such as acrylics and polyester resins have addressed the need for BPA free resins in several applications or new non-biobased alternatives are available.

Another way to increase the biobased content of an epoxy resin, is the use of epichlorohydrin from a biobased source. Epichlorohydrin (ECH) can be formed by the reaction of biobased glycerol and hydrochloric acid in the presence of an acidic catalyst. Since glycerol is a by-product of biodiesel production, it is widely available.

**Solvay (Belgium) and Advanced Biochemical (Thailand)** use patented technology to produce 100% biobased ECH resins under the name Epicerol. Akzonobel started in 2013 by increasing the use of epoxy resins based on biobased ECH. The use of 100% biobased EPC can push the biobased content of epoxy resins to a level of 27%. [33]

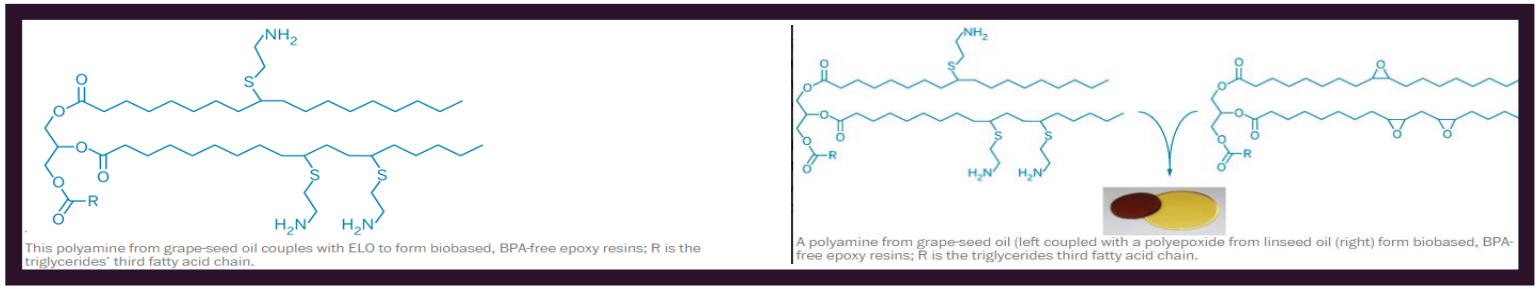






Roll over image to zoom in

**Compatibility of polyamine hardener with ELO resin**



This polyamine from grape-seed oil couples with ELO to form biobased, BPA-free epoxy resins; R is the triglycerides' third fatty acid chain.

A polyamine from grape-seed oil (left coupled with a polyepoxide from linseed oil (right) form biobased, BPA-free epoxy resins; R is the triglycerides third fatty acid chain.

https://cen.acs.org/articles/89/web/2011/09/Biobased-BPA-free-Epoxies.html

# Specific Polymers

## Bio-based UV-curable monomers

Through the collaboration with Pr. Marco Sangermano from the University of Politechnico di Torino, a new thematic has been investigated in SP since 2018 dedicated to the development of “green” coatings by combining the process of photo-polymerization to bio-based monomers. Several bio renewable molecules, from vegetable oils to molecule with aromatic backbones, were identified and chemically modified with epoxy functions in order (i) to be involved in cationic photopolymerization and (ii) to tune the epoxy index and thus the mechanical properties of the materials.

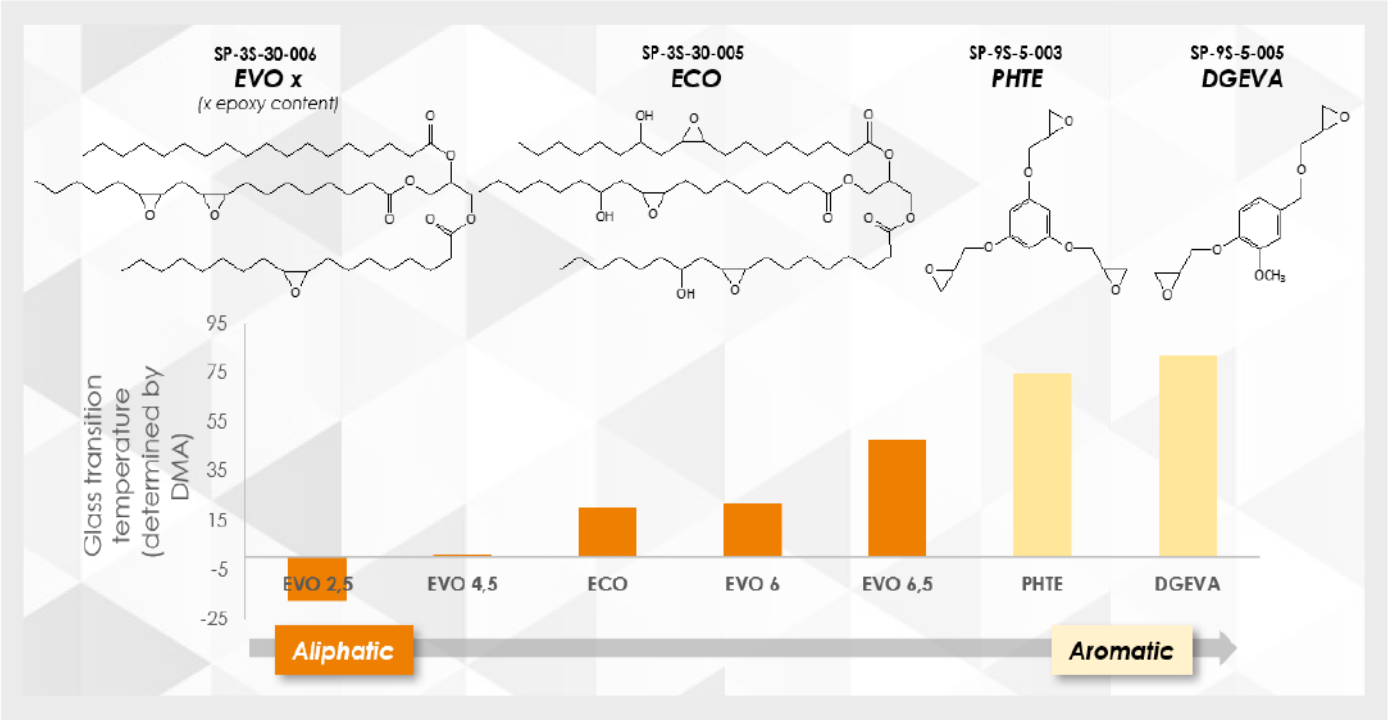



**Figure 4: Chemical structures of epoxidized bio-renewable precursors and their related glass transition temperatures after cationic photo-polymerization**

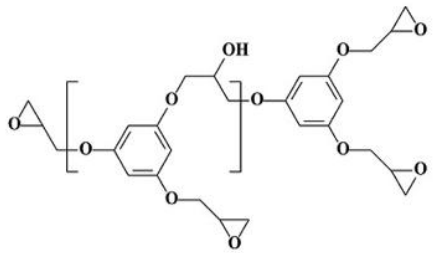
https://specificpolymers.com/wp-content/uploads/2020/07/SP6-UV-CurableMaterials.pdf

# Specific Polymers

## EXPERIMENTAL GRADES AVAILABLE AT LAB-SCALE, INITIALLY INTENDED FOR THERMOSET FIBER-REINFORCED COMPOSITES

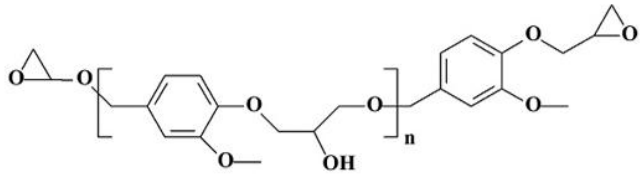
ECOXY H2020 project (www.ecoxy.eu) is an integral part of this innovation work. Indeed, in this project, innovative bio-based epoxy resins have been synthesized and studied in order to substitutes DGEBA in the applications targeted by the project (automotive and construction sectors). Two kinds of products were developed were evaluated in parallel :

- **Aromatic Biobased Precursors**: First strategy was to achieve the synthesis of aromatic resins bearing multi-functional glycidyl ether moieties. In this case, the study was based on the chemical modification of vanillin alcohol or phloroglucinol. Vanillin alcohol can be extracted from Lignin[1] and Phloroglucinol can be extracted from Algael2]. Both products were synthesized successfully in the scope of the project and are now sell for R&D purpose by SPECIFIC POLYMERS:
  - **SP-9S-5-003**: PHloroglucinol Triglycidyl Ether (PHTE) **Download SP-9S-5-003-TDS**



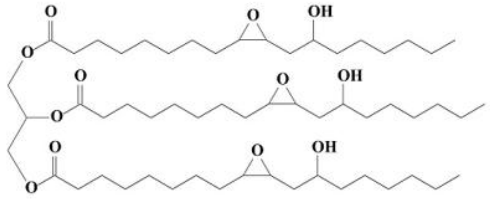
**= phenolic-type can be isolated from bast of fruit trees, plants or algae**

  - **SP-9S-5-005**: Vanillin Alcohol DiGlycidyl Ether (DGEVA) **Download SP-9S-5-005-TDS**

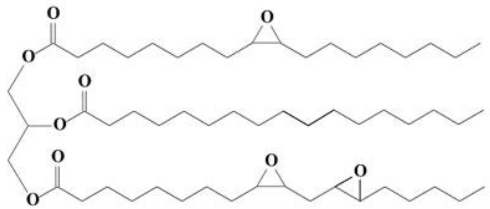


**= vanillin based on lignin**

- **Epoxidation of vegetable oils**: Second strategy concern the epoxidation of unsaturated vegetable oils. To do so, a benchmark of all available vegetable oils was achieved. Most interesting oils were deeply analyzed in order to determine their unsaturation content to adapt the epoxidation modification accordingly. It was finally possible to synthesized a wide range of epoxidized vegetable oils exhibiting a epoxy content from 2.5 méq/g to 7.0 méq/g. These epoxidized vegetable oils are now commercialized by SPECIFIC POLYMERS for R&D purpose under the references **SP-3S-30-005 and SP-3S-30-006**.
  - **SP-3S-30-005** corresponds to epoxidized castor oil and differs from the other oils because of the hydroxyl groups in β-position to the epoxy rings. **Download SP-3S-30-005-TDS**



  - **SP-3S-30-006** corresponds to epoxidized vegetable oils of similar chemical structure but varying from their content of epoxy functions. They are obtained from various vegetable oils such as Saint John's Wort oil or Rapeseed oil for instance. As much as possible, non-edible oils were favored in the selection of the vegetable oil precursors. **Download SP-3S-30-006-TDS**



All these epoxy resins were evaluated and used in the preparation of epoxy-amine materials. The selection of the most promising resins for the project was based on both processes specification and final materials properties. Thus, both the viscosity and the glass transition temperature (Tg) of the cured resins were defined as the most representative parameters for the definition of the most promising resins to further developed for the applications of the project. On one hand, Epoxidized vegetable oils allow to reach Tg in between 15°C and 90°C using the reference hardener. Resins formulated on the basis of DGEVA and PHTE allow to reach Tg in between 90°C to 180°C. Thus, from both these biobased precursors, **It was possible to find a sustainable alternative to DGEBA in epoxy resin formulations**.

innovation forward

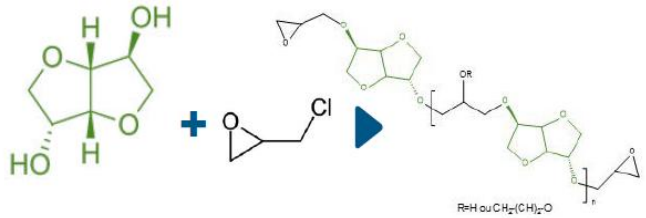
https://ecoxy.eu/news/bio-based-epoxy-resins/

# Roquette

ISOSORBIDE DERIVED EPOXIDE, SORBITOL-BASED POLYOL

- **Synthesis**

Isosorbide diglycidyl ether




## Enhance the quality and the sustainability of your coatings with POLYSORB® - the high purity isosorbide

Our bio-based **POLYSORB®** is an exceptionally pure specialty monomer.

**POLYSORB® can be used in various curable resins such as in:**

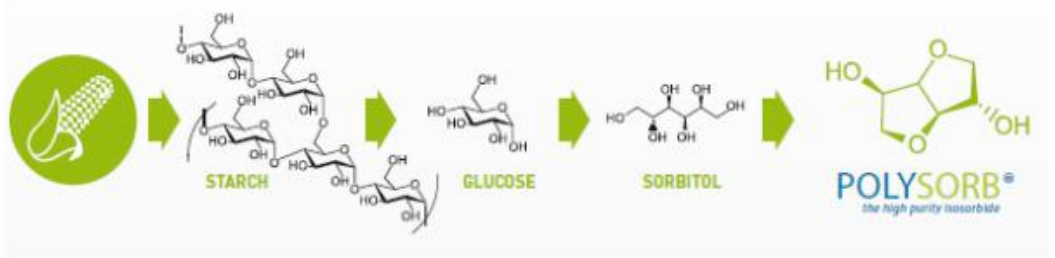
- polyurethane systems (PU),
- epoxy resins,
- UPR (Unsaturated Polyester Resins),
- unsaturated monomers, reactive coatings, etc.

**POLYSORB® helps enhance polymer properties:**

- optical properties,
- scratch resistance,
- temperature resistance,
- UV resistance,
- surface hardness.

In addition to the gain in the efficiency of the resins mentioned below, it increases their sustainability because it is totally **bio-based**.

POLYSORB® can be used directly as building blocks in polymer synthesis or can aslo be considered as the key element for producing new derivatives such as acrylates, BADGE replacement, etc.

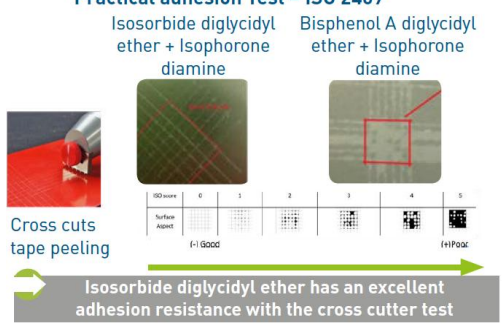



## POLYSORB® ISOSORBIDE A FULL RANGE WITH OUTSTANDING PROPERTIES

| SPECIFICATIONS | POLYSORB® PA | POLYSORB® LP | POLYSORB® PSA |
|---|---|---|---|
| Application | all | polyesters | Polycarbonate, polyurethane |
| Color | white | colorless | white |
| Type | pellets | liquid | pellets |
| Purity (% DS-HPLC) | >=99.5 | >=99.5 | >=99.5 |
| Water content | - | 20.0% max. | - |
| pH (40% in water) | 6.5-8.5 | 6.5-8.5 | 8.0-9.0 |

**Good adhesion**

**Practical adhesion Test – ISO 2409**




**Isosorbide diglycidyl ether has an excellent adhesion resistance with the cross cutter test**

| Epoxy | Hardener | K1c (Mpa.m$^{1/2}$) |
|---|---|---|
| Isosorbide diglycidyl ether | Isophorone diamine | 1.3 (0.15) |
| DER 332 | Isophorone diamine | 0.74 (0.05) |
| 80% DER 332 + 20% Isosorbide diglycidyl ether | Isophorone diamine | 0.85 (0.04) |
| Triglycidyl ether of trimethylol propane | Isophorone diamine | 1.02 (0.07) |
| 80% triglycidyl ether of trimethylol propane + 20% Isosorbide diglycidyl ether | Isophorone diamine | 1.15 (0.08) |

**Toughness improvement versus Bisphenol A diglycidyl ether and triglycidyl ether of trimethylol propane**

innovation forward

https://fr.roquette.com/-/media/roquette-sharepoint-libraries/marcomonline---industry/roquette-industry-performance-materials-technical-fact-sheet-isosorbide-in-epoxy-and-in-pu-coating.pdf
https://www.roquette.com/media-center/resources/industry-performance-materials-technical-fact-sheet-isosorbide-in-epoxy-and-in-pu-coating

# Rescoll

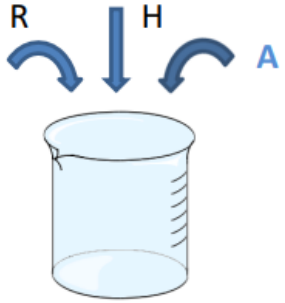
- The aim is to develop **new biobased resins** with levels of performance equal or superior to fossil based existing resins:
  - **Thermomechanical properties**
  - **Mechanical properties**
  - **Reactivity**
  - **Bio renewable content**
  - **Bonding properties for adhesives uses**

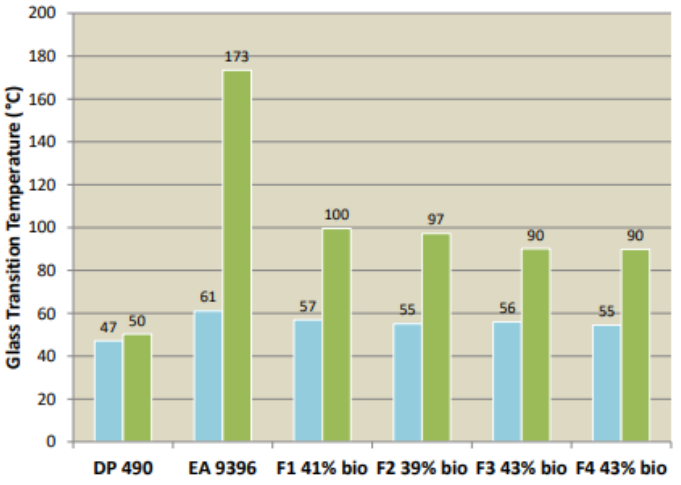
**Biobased Hardener characteristics**
- Based on monomer Cardanol, distilled from Cashew Nut Shell Liquid, CNSL
- CNSL is a natural, non-food chain, and annually renewable biomaterial
- Renewable content > 60%

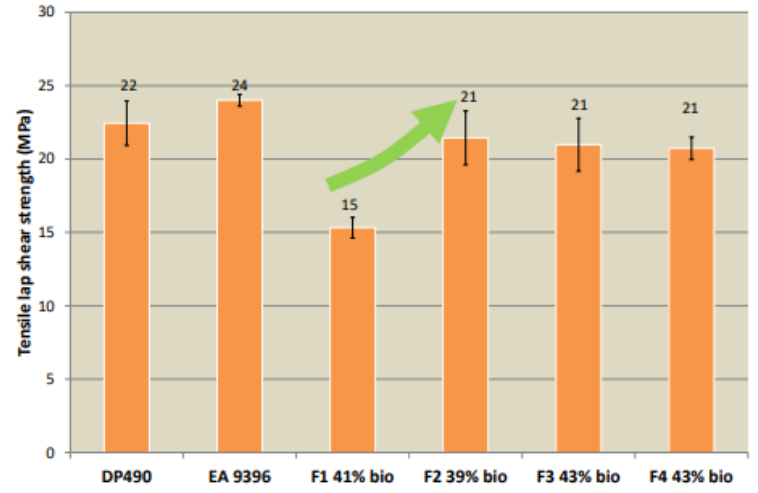
**Biobased Epoxy resin characteristics**
- Liquid epoxy resin produced from epichlorhydrin based on glycerine
- Renewable content : 28%

Biobased epoxy resin / biobased hardener

A + fossil toughener (**0% bio**) **or** biobased dilutant 1(**86% bio**) **or** biobased dilutant 2(**86% bio**)




✓ Cardanol based products seem worthy of interest for biobased structural adhesive resin applications

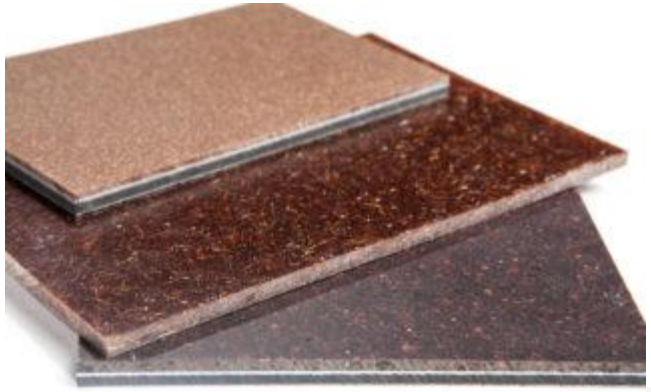
✓ Biobased epoxy resins just mimic the molecular structure of fossil based resins in use of less toxic biobased intermediates

innovation forward

https://rescoll.fr/wp-content/uploads/Bio-based-resins-from-RESCOLL.x55499.pdf

# Orineo

ORIBOND 100 % BIO-BASED EPOXY



We create bio-based binding agents and durable plantbased materials

### The Art

In addition to a portfolio of bio-based binding agents, Orineo creates aesthetic and haptic plantbased materials that enhance living spaces.

### The Technology

New binding agents and materials are optimized to the requirements of industrial production through innovative combination of unique bio-based ingredients.

### The Process

Orineo has long-term agreements with its suppliers and value chain partners, to guarantee high quality production and supply of its products.

### The Business

An active IP policy, including patents, trade secrets and branding ensures sustainable business development.

## OriBond

A 2-component (resin + hardener) thermosetting binder system

- 100 % derived from annual plants
- Water resistant
- Non-toxic ingredients: clean label policy, excluding GHS06, 08 and 09 pictograms
- Versatile curing conditions (from room temperature to 180°C)
- Suited for agglomerated panels, high pressure laminates and fiber reinforced composites

## Bio-based binding agents

We are developing bio-based materials to bind agglomerate granules, chips and powders such as cork, bark, wood and agro waste by-products.

Now available:

**OriBond:** a 2-component (resin + hardener) thermosetting binder system

- 100% derived from annual plants
- non-toxic ingredients: formaldehyde and isocyanate-free
- water resistant
- versatile curing conditions (from room temperature to 180˚C)
- ranges from flexible to rigid

## Durable plantbased materials

The **plantbased materials** developed by Orineo are grouped under the Touch of Nature® brand.

By combining OriBond with **food- and agro-industry waste** such as berry skins, orange peelings, coffee grounds, oat hulls and coconut husks we are effectively upcycling biomass into aesthetic materials with unique warm and resilient touch:

**Touch of Nature®**

Touch of Nature® materials are suited for durable applications such as table-tops, furniture finishing, interior design and floors.

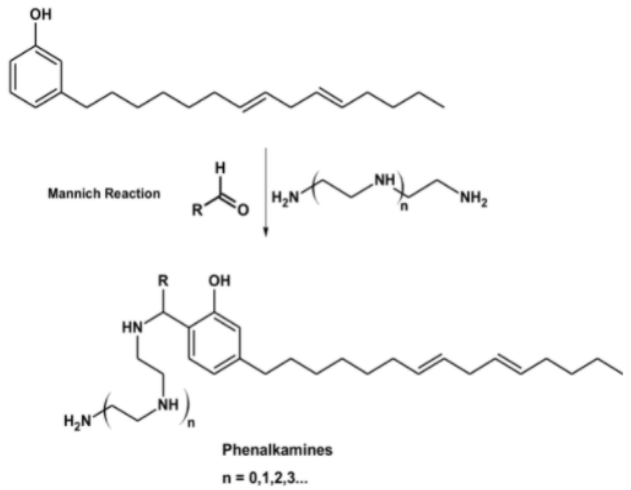
Visit the Touch of Nature website to see our plantbased materials.

innovation forward

100 % bio-epoxy grade = patented 2K system

https://orineo.com/#home

# Cardolite






## CNSL-based epoxy diluents and modifiers

- Benefits
  - Less impact on Tg and flexural strength
  - Water Resistance
  - Dilution power
  - High bio content
- Process
  - 2K Hand lay-up (NC/UL513/514S)
  - 2K RTM (NC/UL513/514S)
  - 2K Vacuum process (NC/UL513/514S)
  - 2K Pultrusion (NC/UL513/514S)
  - 1K Prepreg (NC-514, NC-547)
- Applications
  - Marine
  - Building and construction
  - Sports & leisure
  - Automotive and transportation
  - Wind energy

## CNSL-based epoxy curing agents

- Benefits
  - Excellent water/chemical resistance
  - Wide range of pot life and glass transition temperature
  - Good reactivity at room temperature
  - High bio-content
  - Good processability and wetting
- Process
  - Hand lay-up
  - RTM
  - Vacuum process
- Applications
  - Marine
  - Constructions
  - Sports & leisure
  - Automotive and transportation

**PHENALKAMINE EPOXY CURING AGENTS** **PHENALKAMIDE EPOXY CURING AGENTS** **WATERBORNE TECHNOLOGY**

**NON-REACTIVE DILUENTS** **REACTIVE DILUENTS** **HIGH BIO-CONTENT EPOXY RESINS AND MODIFIERS**

innovation forward

https://www.cardolite.com/products/

# Resoltech

## RESOLTECH 1070 ECO

### Hardener 1074 ECO

**Bio-based Clear Lamination Epoxy System**

- 31% Bio-sourced **epoxy resin system (ASTM D6866-12)**
- **Room temperature cure & mould release**
- **$T_G$ up to 73°C**
- **Excellent wetting properties on all reinforcements**
- **For structural laminates and top-coats**

RESOLTECH 1070 ECO is a high end crystal clear epoxy laminating system formulated to produce clear laminates and high gloss clear coatings with good UV stability and high mechanical properties.

The 1070 ECO system is a state of the art formulation using two key elements in it bio composition: a partially bio sourced epoxy resin with an plant based reactive diluent, obtaining the highest available bio content without compromising the mechanical characteristics of a structural epoxy system.

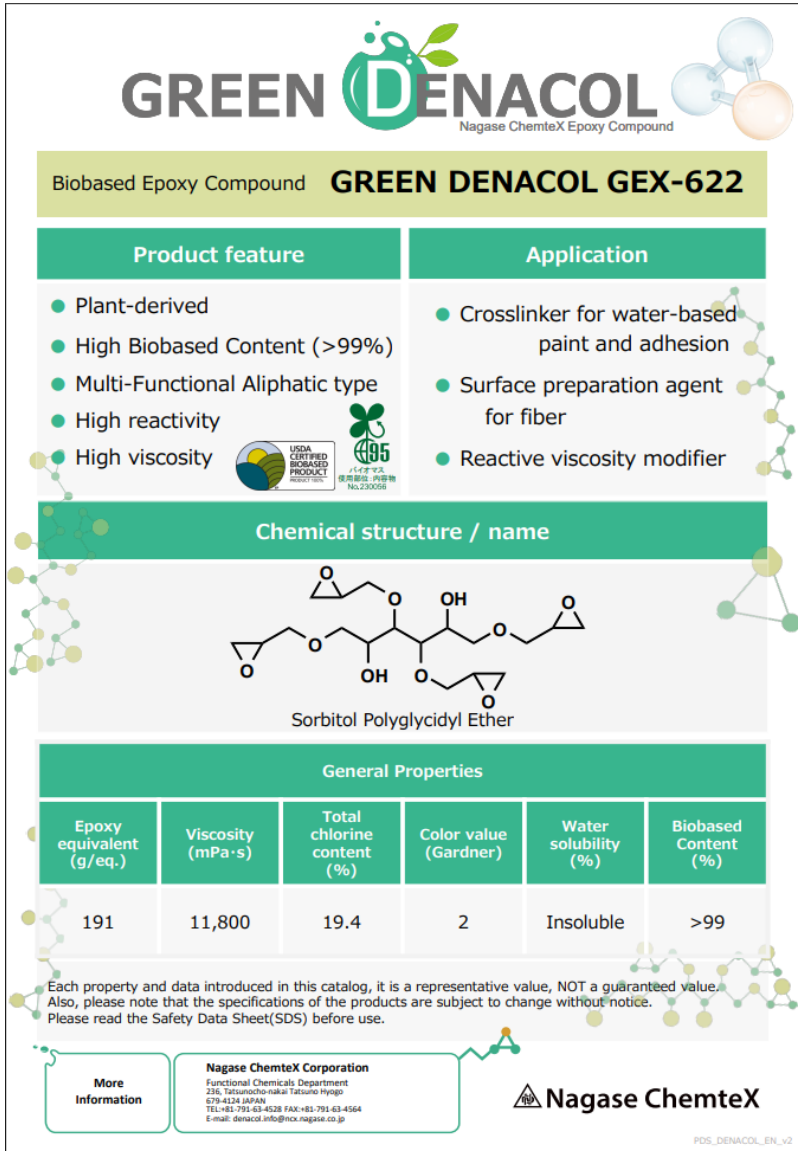
The resulting laminates will be absolutely clear on carbon fibre and even transparent if applied on special Hexcel Silionne E- glass fabrics with TF970 treatment.

The viscosity is adapted for squeegee, brush or roller application, and enables to make perfect bubble free surface due to its surface tension properties. The 1070 ECO system has been formulated in order to leave virtually no free amines on the laminate. This even enables the use of any quality polyester finish coat for quick sanding on top of the laminate without inhibition of the polyester.

| | Resoltech 1070 ECO | Resoltech 1070S clear + verharder 1074 |
|---|---|---|
| Viscositeit | 700 | 650 |
| Potlife | 28 | 30 |
| Tg (16h 60°) | 74 | 64 |
| Gel time 70 ml | 30 min | 30 min |
| Modulus | 3,24 GPa | 2.3 |
| Max stress MPa | 110,6 | 85.8 |
| Elongation | 5,3 | 4,7 |

| Property | 1070 Clear | 1074 | 1070 ECO | 1074 ECO |
|---|---|---|---|---|
| Density 23°C | 1.15 | 0.99 | 1.18 | 0.96 |
| Mixed density 23°C | - | 1.10 | - | 1.22 |
| Viscosity 23°C (mPa.s) | 2600/2200 | 70 | 1750 | 50 |
| Mixed viscosity 23°C (mPa.s) | - | 685/560 | - | 700 |

# Nagase ChemteX



GREEN DENACOL
Nagase ChemteX Epoxy Compound

Biobased Epoxy Compound **GREEN DENACOL GEX-622**

**Product feature**

- Plant-derived
- High Biobased Content (>99%)
- Multi-Functional Aliphatic type
- High reactivity
- High viscosity

**Application**

- Crosslinker for water-based paint and adhesion
- Surface preparation agent for fiber
- Reactive viscosity modifier

**Chemical structure / name**

Sorbitol Polyglycidyl Ether

**General Properties**

| Epoxy equivalent (g/eq.) | Viscosity (mPa·s) | Total chlorine content (%) | Color value (Gardner) | Water solubility (%) | Biobased Content (%) |
|---|---|---|---|---|---|
| 191 | 11,800 | 19.4 | 2 | Insoluble | >99 |

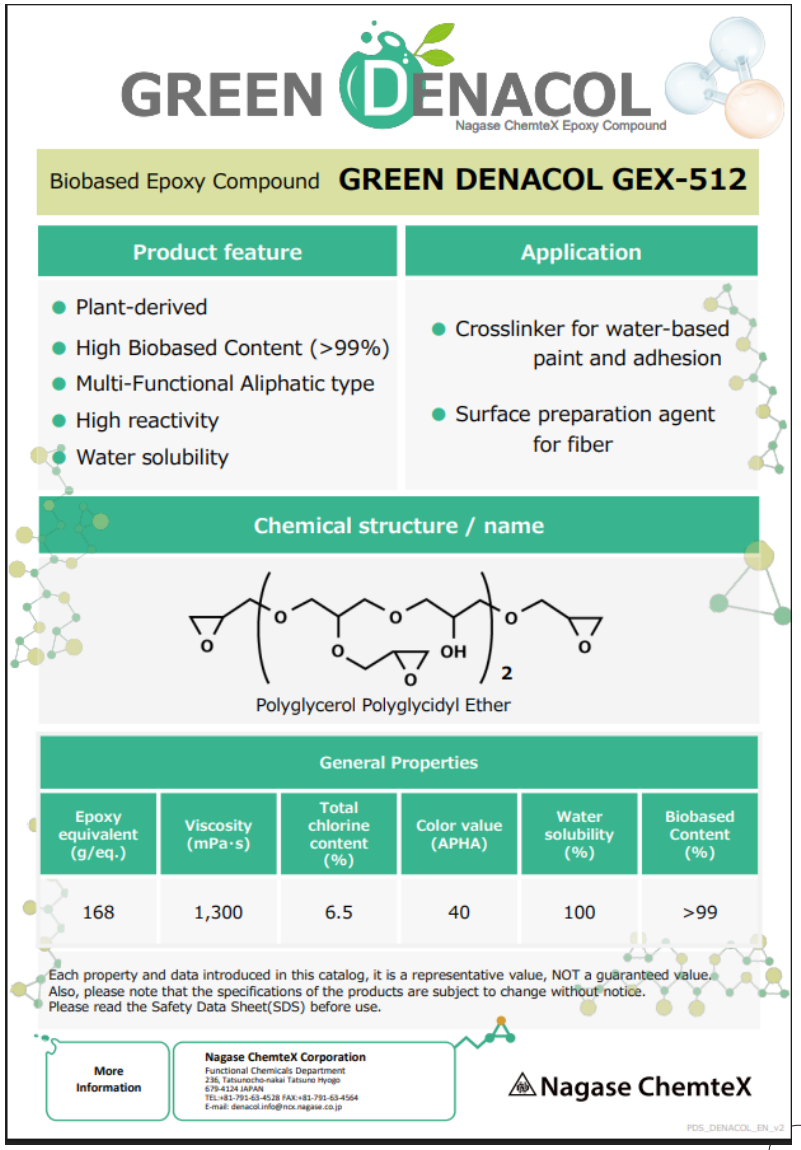
Each property and data introduced in this catalog, it is a representative value, NOT a guaranteed value.
Also, please note that the specifications of the products are subject to change without notice.
Please read the Safety Data Sheet(SDS) before use.

More Information

Nagase ChemteX Corporation
Functional Chemicals Department
236, Tatsunocho-nakai Tatsuno Hyogo
679-4124 JAPAN
TEL:+81-791-63-4528 FAX:+81-791-63-4564
E-mail: denacol.info@ncx.nagase.co.jp

Nagase ChemteX

PDS_DENACOL_EN_v2



GREEN DENACOL
Nagase ChemteX Epoxy Compound

Biobased Epoxy Compound **GREEN DENACOL GEX-512**

**Product feature**

- Plant-derived
- High Biobased Content (>99%)
- Multi-Functional Aliphatic type
- High reactivity
- Water solubility

**Application**

- Crosslinker for water-based paint and adhesion
- Surface preparation agent for fiber

**Chemical structure / name**

Polyglycerol Polyglycidyl Ether

**General Properties**

| Epoxy equivalent (g/eq.) | Viscosity (mPa·s) | Total chlorine content (%) | Color value (APHA) | Water solubility (%) | Biobased Content (%) |
|---|---|---|---|---|---|
| 168 | 1,300 | 6.5 | 40 | 100 | >99 |

Each property and data introduced in this catalog, it is a representative value, NOT a guaranteed value.
Also, please note that the specifications of the products are subject to change without notice.
Please read the Safety Data Sheet(SDS) before use.

More Information

Nagase ChemteX Corporation
Functional Chemicals Department
236, Tatsunocho-nakai Tatsuno Hyogo
679-4124 JAPAN
TEL:+81-791-63-4528 FAX:+81-791-63-4564
E-mail: denacol.info@ncx.nagase.co.jp

Nagase ChemteX

PDS_DENACOL_EN_v2

innovation forward

https://group.nagase.com/nagasechemtex/denacol/en/column/20240301/

# Sika






Sika offers a range of coating systems for various applications, such as waterproofing, flooring and decorative finishes. Coating systems offered by Sika include: Sikagard®, a range of protective coatings that are designed to protect structures against environmental and chemical damage, Sikalastic®, a range of liquid-applied membranes that are used for waterproofing and protection against moisture, or Sikafloor®, a range of flooring systems that are designed for industrial and commercial applications like Sika® Ucrete®.

## Embracing bio-based solutions

Traditionally, the epoxy industry has relied on "fossil" epoxies, but Sika is making a conscious shift to bio-based alternatives.

The bio-based glycerin used for epichlorohydrin synthesis is a by-product of biodiesel production and primarily derives from waste oils, leftover cooking fats from large kitchens, rapeseed oil, and other vegetable oils. This shift not only reduces reliance on fossil resources but also paves the way for more sustainable manufacturing processes.

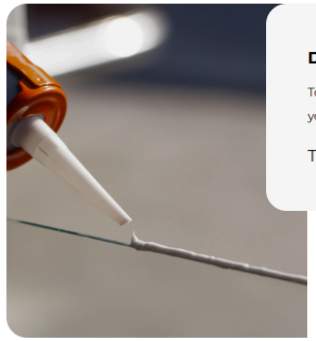
Sika successfully produced flooring coatings with epoxy resins containing 28% of bio-based carbon. This commitment to sustainable epoxy resins not only signifies a substantial reduction in Sika's reliance on fossil resources but also underscores Sika's unwavering commitment to environmental responsibility.

# De Monchy

## Bio-Based Epoxy Resins – Sustainable & Low Viscosity Epoxy Supplier

Bio-based Epoxy Resins (also known as bio epoxy resin or eco-friendly epoxy resin) are innovative, plant-derived solutions designed to replace traditional bisphenol A epoxy resin and bisphenol F epoxy resin systems. Sourced from renewable feedstocks such as vegetable oils, lignin, or glycerol, these sustainable epoxy resins offer excellent adhesion, mechanical strength, and chemical resistance while reducing environmental impact.

As an epoxy resin supplier and experienced technical partner, De Monchy provides a portfolio of bio-based, modified, and toughened epoxy resins, available in different viscosities and performance grades to fit different application needs.



**Download product specifications**

To download the specifications, please provide your email address for verification.

Thank you for your submission!



Applications of Bio-based Epoxy Resin

### Coatings, Adhesives & Composites

Our bio epoxy resins are widely used in industrial coatings, structural adhesives, and epoxy resin for composites. They deliver excellent adhesion, toughness, and high heat resistance, making them ideal for high temperature epoxy resin applications in automotive, construction, and electronics.

In coating formulations, they provide high gloss, abrasion resistance, and chemical durability. In composites, low viscosity resin systems enable excellent fiber wet-out and mechanical strength, critical for lightweight, high-performance materials.

Help me find the right grade

### What are Bio-based Epoxy Resins?

Bio-based epoxy resins are thermosetting polymers that combine renewable content with high mechanical and chemical performance. They are formulated as low viscosity epoxy resins, solid epoxy resins, and waterborne epoxy resins, suitable for use across coatings, adhesives, composites, and flooring systems.

- High-performance & sustainable → comparable to conventional high performance epoxy resins
- Renewable feedstocks → derived from bio-based oils, lignin, or sugars
- Reduced carbon footprint → sustainable alternative to fossil-based phenolic epoxy resin or novolac epoxy resin systems
- Non-toxic & REACH-compliant → safe for industrial and consumer formulations

NAN YA

### About our supplier

Established in 1958 by industrialist Yung-Ching Wang in Taipei, Taiwan, Nan Ya Plastics Corporation stands as one of the chemical and plastics companies within the Formosa Group. Widely recognized as the world's largest manufacturer of secondary plastics, Nan Ya is also a prominent producer of polyester fibers and copper-clad laminates for electronic materials.

innovation forward

https://monchy.com/products/bio-based-epoxy-resins/

# A&I Coatings

## BIO-BASED EPOXIES

Bio-based epoxy floor coatings are an innovative and sustainable alternative to traditional epoxy systems, which are typically derived from petroleum-based sources. These coatings utilize renewable resources such as plant oils, lignin, and other biomaterials as their primary resin components, significantly reducing their environmental impact. The use of bio-based materials not only helps decrease reliance on fossil fuels but also contributes to a lower carbon footprint, making these coatings an eco-friendly option for a variety of applications. Additionally, bio-based epoxy coatings often have reduced toxicity and lower levels of volatile organic compounds (VOCs), which improves indoor air quality and enhances the overall safety of the environments in which they are used.

In terms of performance, bio-based epoxy floor coatings are engineered to offer comparable durability, chemical resistance, and mechanical strength to their traditional counterparts. This makes them suitable for a wide range of settings, including industrial floors, commercial spaces, and residential applications like garages or basements. These coatings can be customized with different tints and finishes, allowing for aesthetic versatility while maintaining their environmental benefits. The adoption of Bio-Based Epoxies is expected to grow as sustainability becomes a higher priority in building materials and construction practices.

**PRODUCTS FEATURED**
ENDURAFLOOR Autoshield BIO
ENDURAFLOOR Milano BIO
ENDURAFLOOR RC BIO
ENDURAFLOOR RC UV BIO
ENDURAFLOOR SL BIO
ENDURAFLOOR SR BIO

**DOWNLOADS**
**ENDURAFLOOR Autoshield BIO** System Data Sheet
**ENDURAFLOOR Milano BIO** System Data Sheet
**ENDURAFLOOR RC BIO** System Data Sheet
**ENDURAFLOOR RC UV BIO** System Data Sheet
**ENDURAFLOOR SL BIO** System Data Sheet
**ENDURAFLOOR SR BIO** System Data Sheet





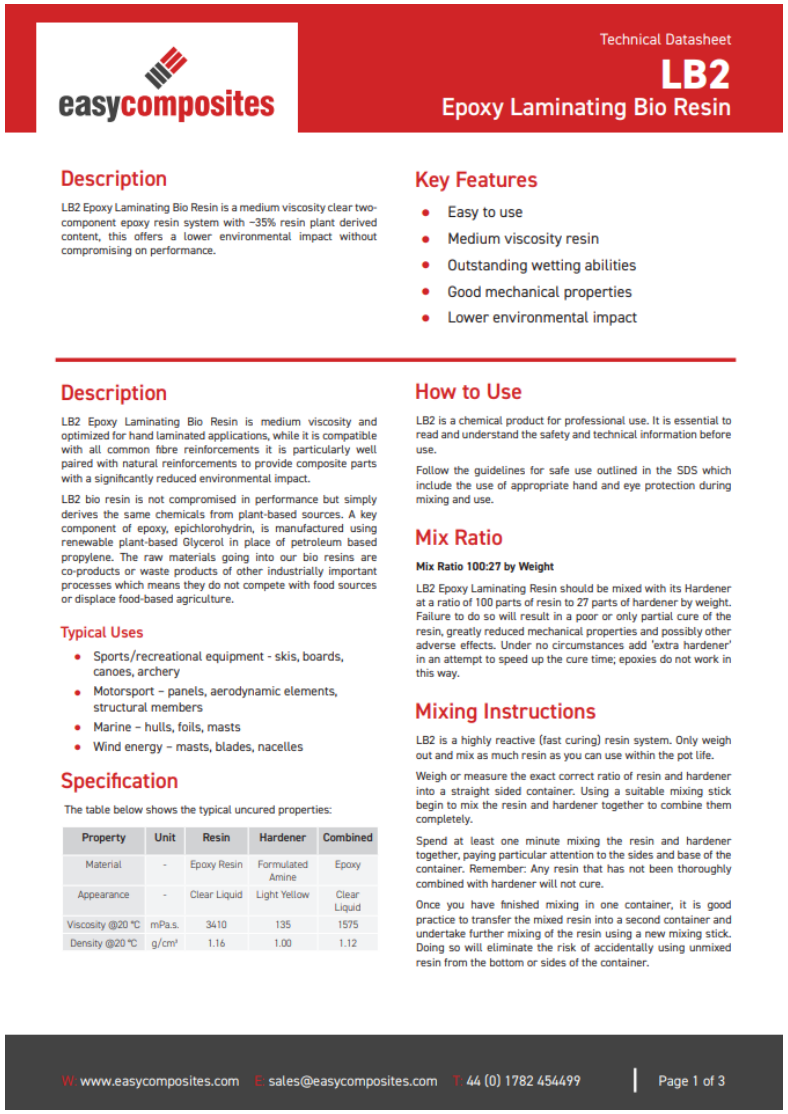




innovation forward

https://www.aicoatings.com.au/product/bio-based-epoxies/

# Easy Composites



easycomposites

Technical Datasheet

## LB2
Epoxy Laminating Bio Resin

### Description

LB2 Epoxy Laminating Bio Resin is a medium viscosity clear two-component epoxy resin system with ~35% resin plant derived content, this offers a lower environmental impact without compromising on performance.

### Key Features

- Easy to use
- Medium viscosity resin
- Outstanding wetting abilities
- Good mechanical properties
- Lower environmental impact

### Description

LB2 Epoxy Laminating Bio Resin is medium viscosity and optimized for hand laminated applications, while it is compatible with all common fibre reinforcements it is particularly well paired with natural reinforcements to provide composite parts with a significantly reduced environmental impact.

LB2 bio resin is not compromised in performance but simply derives the same chemicals from plant-based sources. A key component of epoxy, epichlorohydrin, is manufactured using renewable plant-based Glycerol in place of petroleum based propylene. The raw materials going into our bio resins are co-products or waste products of other industrially important processes which means they do not compete with food sources or displace food-based agriculture.

### Typical Uses

- Sports/recreational equipment - skis, boards, canoes, archery
- Motorsport – panels, aerodynamic elements, structural members
- Marine – hulls, foils, masts
- Wind energy – masts, blades, nacelles

### Specification

The table below shows the typical uncured properties:

| Property | Unit | Resin | Hardener | Combined |
|---|---|---|---|---|
| Material | - | Epoxy Resin | Formulated Amine | Epoxy |
| Appearance | - | Clear Liquid | Light Yellow | Clear Liquid |
| Viscosity @20 °C | mPa.s. | 3410 | 135 | 1575 |
| Density @20 °C | g/cm³ | 1.16 | 1.00 | 1.12 |

### How to Use

LB2 is a chemical product for professional use. It is essential to read and understand the safety and technical information before use.

Follow the guidelines for safe use outlined in the SDS which include the use of appropriate hand and eye protection during mixing and use.

### Mix Ratio

**Mix Ratio 100:27 by Weight**

LB2 Epoxy Laminating Resin should be mixed with its Hardener at a ratio of 100 parts of resin to 27 parts of hardener by weight. Failure to do so will result in a poor or only partial cure of the resin, greatly reduced mechanical properties and possibly other adverse effects. Under no circumstances add 'extra hardener' in an attempt to speed up the cure time; epoxies do not work in this way.

### Mixing Instructions

LB2 is a highly reactive (fast curing) resin system. Only weigh out and mix as much resin as you can use within the pot life.

Weigh or measure the exact correct ratio of resin and hardener into a straight sided container. Using a suitable mixing stick begin to mix the resin and hardener together to combine them completely.

Spend at least one minute mixing the resin and hardener together, paying particular attention to the sides and base of the container. Remember: Any resin that has not been thoroughly combined with hardener will not cure.

Once you have finished mixing in one container, it is good practice to transfer the mixed resin into a second container and undertake further mixing of the resin using a new mixing stick. Doing so will eliminate the risk of accidentally using unmixed resin from the bottom or sides of the container.





### Pot-Life / Working Time / Cure Time

LB2 is a highly reactive resin system and once the resin has been mixed with the hardener, the reaction will start to give off heat (exotherm) which will further accelerate the cure of the resin, especially when the resin is in the mixing pot.

Transfer the resin from the mixing pot onto the part as soon as possible to extend the working time and avoid the risk of uncontrollable rapid cure in the mixing pot.

As with all epoxies, the pot-life/working time will vary significantly depending on the ambient temperature, the starting temperature of the resin and hardener and the amount of resin mixed.

IB2 can be used in ambient temperatures between 15°C (59°F) and 30°C (86°F). For best results, an ambient temperature of at least 20°C (68°F) is recommended. Ensure that both resin and hardener containers are within this temperature range before use.

For larger infusions, you can reduce the chance of the resin 'gelling' in the pot by mixing small quantities at a time and topping up the resin feed bucket as the resin is drawn into the laminate. Once the resin is in the laminate, it is much less likely to exotherm and gel before you want it to.

The table below gives an indication of pot-life and cure times:

| | Pot Life 20°C (500g) | Gel Time 20°C (1mm) | Demould time 20°C |
|---|---|---|---|
| Time | 23mins | 5hrs 4mins | 17hr |

### Full Cure / Post-Cure

As with most epoxy systems, where parts cure in normal ambient temperatures, full cure is not reached for several days. Although parts will be handleable after the listed demould time (at 25°C), full mechanical properties will take at least 14 days to develop in (at 25°C). Where possible, avoid exposing the cured resin to full service rigours for at least this time.

Mechanical properties and temperature resistance can be improved with means of a post cure at elevated temperature once the initial cure is completed. For parts that will be used at or exposed to elevated operating temperatures (such as vehicle bonnets/hoods in direct sunlight, engine-bay parts, car interior parts etc.) a post cure is strongly recommended to prevent distortion of the parts when they are put into service and experience these higher temperatures.

Where possible, parts should be post-cured still inside the mould to reduce distortion and improve surface finish (i.e. reduce 'print-through'). When post-curing parts in the mould, it is important to post-cure them without demoulding at all (i.e. don't demould and then put them back into the mould) otherwise you can get some strange patterns on the surface where some areas are post cured in direct contact with the mould surface and others are not.

CYCLE #1 SUITABLE FOR MOST SITUATIONS

- 16hrs at room temperature
- 24hrs at 40°C

If encountering any surface finish issues (faint print-through) then placing the part into a cool oven and gently increasing the temperature reduces the amount that the resin will soften all in one go.

CYCLE #2 Maximal TG

- 16hrs at room temperature
- 4hrs at 40°C
- 4hrs at 60°C
- 4hrs at 80°C

This extended cycle, gradually ramping up between each temperature step will achieve the maximum TG of around 100°C.

### Mechanical Properties

Cured Resin Properties

| Property | Unit | Post Cure | | |
|---|---|---|---|---|
| | | Ambient + 24hrs 40 °C | Ambient + 8hrs 60 °C | Ambient + 4hrs 80 °C |
| Tensile Modulus | GPa | 3.40 | 3.23 | 3.05 |
| Tensile Stength | MPa | 82.0 | 78.0 | 75.0 |
| Elong. at Break | % | 4.3 | 5.8 | 6.0 |
| Flexural Moulus | GPa | 3.40 | 3.20 | 2.90 |
| Flexural Strength | MPa | 127.0 | 127.0 | 125.0 |
| Shear Strength | MPa | 52.0 | 52.0 | 53.0 |
| Compression Strength | MPa | 110.0 | 107.0 | 104.0 |
| Impact Resistance | KJ/m² | 25.0 | 25.0 | 23.0 |
| Tg Onset | °C | 69.0 | 90.0 | 100.0 |

### Transport and Storage

Resin and hardener should be kept in tightly seal containers during transport and storage. Both the resin and hardener should be stored in ambient conditions of between 10°C (50°F) and 25°C (77°F).

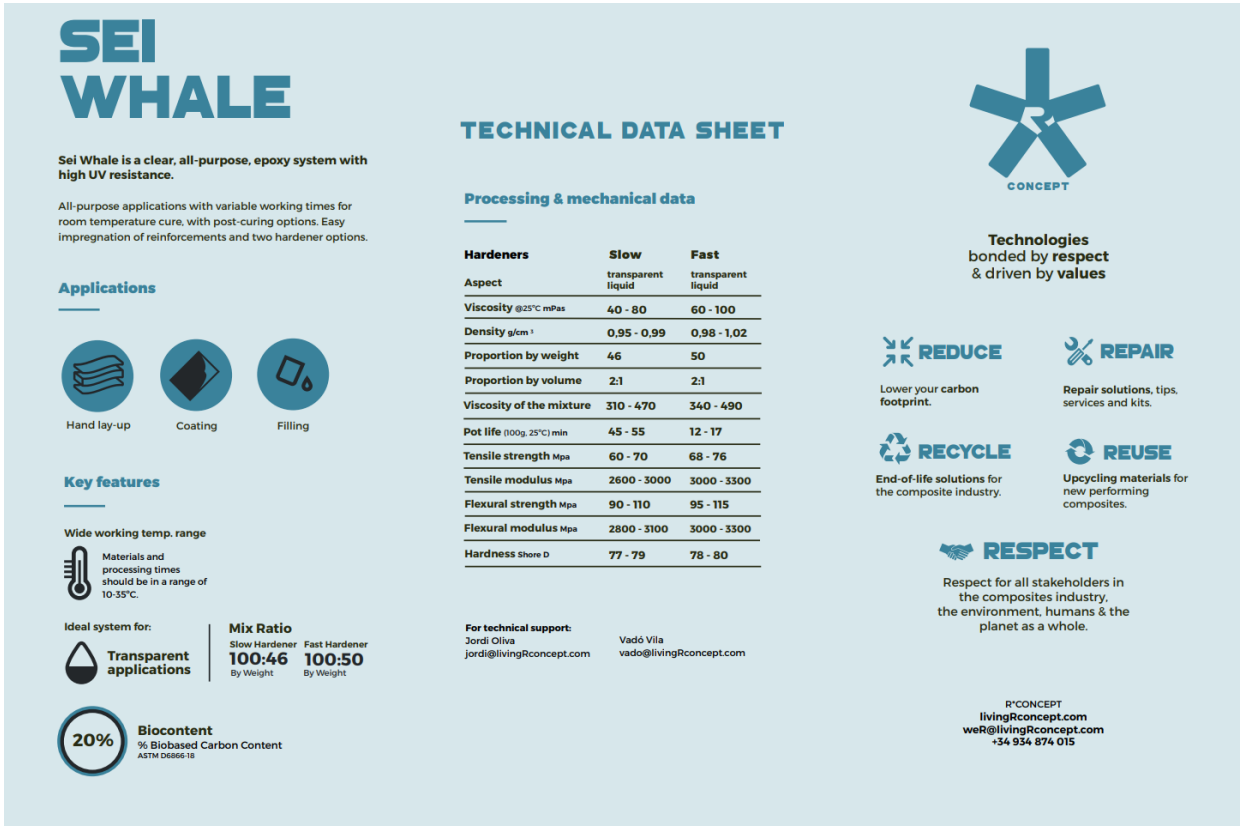
When stored correctly, the resin and hardener will have a shelf-life of 24 months. Although it may be possible to use the resin after a longer period, a deterioration in the performance of the resin will occur, especially in relation to clarity and cure profile.

Pay particular attention to ensuring that containers are kept tightly sealed. Epoxy hardeners especially will deteriorate quickly when exposed to air.



https://media.easycomposites.eu/datasheets/EC-TDS-LB2-Epoxy-Laminating-Bio-Resin.pdf

# Professional Epoxy Coatings



## SEI WHALE

**Sei Whale is a clear, all-purpose, epoxy system with high UV resistance.**

All-purpose applications with variable working times for room temperature cure, with post-curing options. Easy impregnation of reinforcements and two hardener options.

### Applications

Hand lay-up · Coating · Filling

### Key features

**Wide working temp. range**

Materials and processing times should be in a range of 10-35°C.

Ideal system for: **Transparent applications**

**Mix Ratio**

Slow Hardener **100:46** By Weight

Fast Hardener **100:50** By Weight

**20%** **Biocontent**

% Biobased Carbon Content

ASTM D6866-18

### TECHNICAL DATA SHEET

#### Processing & mechanical data

| Hardeners | Slow | Fast |
|---|---|---|
| Aspect | transparent liquid | transparent liquid |
| Viscosity @25°C mPas | 40 - 80 | 60 - 100 |
| Density g/cm³ | 0,95 - 0,99 | 0,98 - 1,02 |
| Proportion by weight | 46 | 50 |
| Proportion by volume | 2:1 | 2:1 |
| Viscosity of the mixture | 310 - 470 | 340 - 490 |
| Pot life (100g, 25°C) min | 45 - 55 | 12 - 17 |
| Tensile strength Mpa | 60 - 70 | 68 - 76 |
| Tensile modulus Mpa | 2600 - 3000 | 3000 - 3300 |
| Flexural strength Mpa | 90 - 110 | 95 - 115 |
| Flexural modulus Mpa | 2800 - 3100 | 3000 - 3300 |
| Hardness Shore D | 77 - 79 | 78 - 80 |

**For technical support:**

Jordi Oliva
jordi@livingRconcept.com

Vadó Vila
vado@livingRconcept.com

R*CONCEPT

**Technologies** bonded by **respect** & driven by **values**

**REDUCE** Lower your **carbon footprint.**

**REPAIR** **Repair solutions**, tips, services and kits.

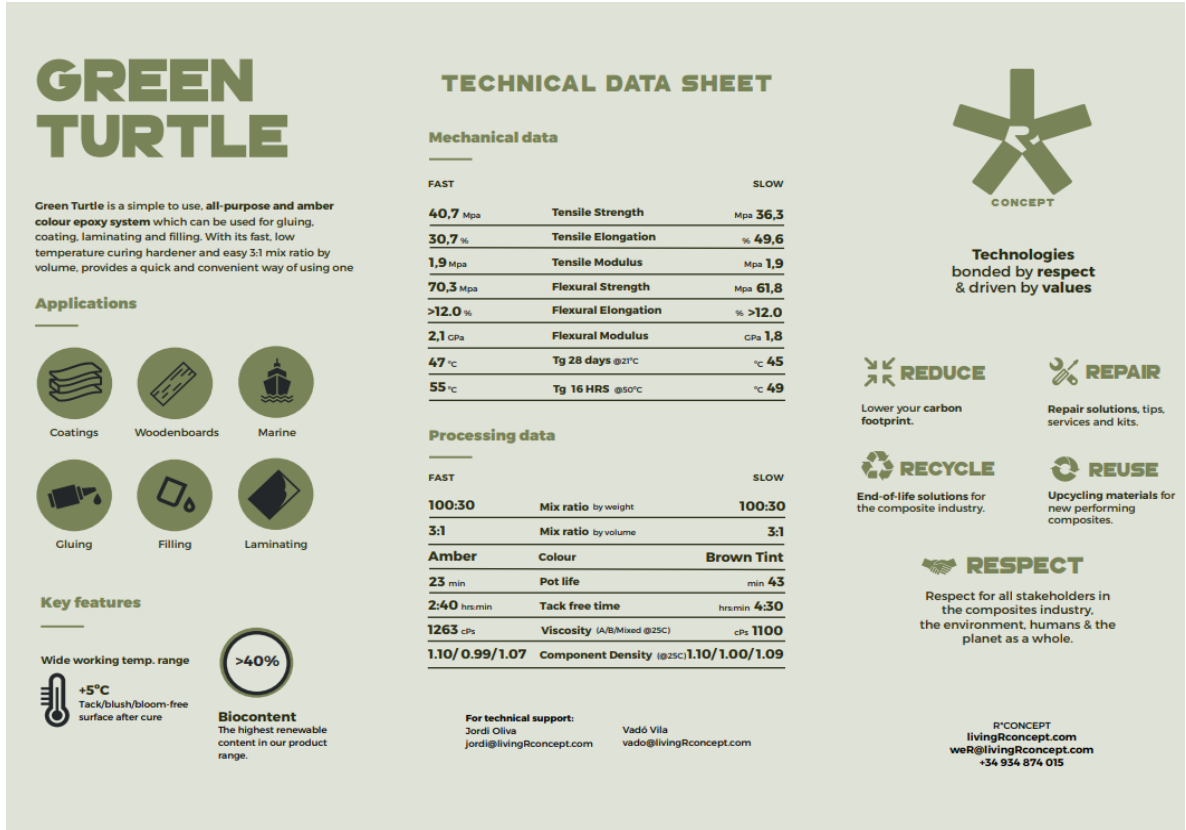
**RECYCLE** **End-of-life solutions** for the composite industry.

**REUSE** **Upcycling materials** for new performing composites.

**RESPECT**

Respect for all stakeholders in the composites industry, the environment, humans & the planet as a whole.

R*CONCEPT
**livingRconcept.com**
**weR@livingRconcept.com**
**+34 934 874 015**



## GREEN TURTLE

**Green Turtle** is a simple to use, **all-purpose and amber colour epoxy system** which can be used for gluing, coating, laminating and filling. With its fast, low temperature curing hardener and easy 3:1 mix ratio by volume, provides a quick and convenient way of using one

### Applications

Coatings · Woodenboards · Marine · Gluing · Filling · Laminating

### Key features

**Wide working temp. range**

**+5°C** Tack/blush/bloom-free surface after cure

**>40%** **Biocontent**

The highest renewable content in our product range.

### TECHNICAL DATA SHEET

#### Mechanical data

| FAST | | SLOW |
|---|---|---|
| 40,7 Mpa | Tensile Strength | Mpa 36,3 |
| 30,7 % | Tensile Elongation | % 49,6 |
| 1,9 Mpa | Tensile Modulus | Mpa 1,9 |
| 70,3 Mpa | Flexural Strength | Mpa 61,8 |
| >12.0 % | Flexural Elongation | % >12.0 |
| 2,1 GPa | Flexural Modulus | GPa 1,8 |
| 47 °C | Tg 28 days @21°C | °C 45 |
| 55 °C | Tg 16 HRS @50°C | °C 49 |

#### Processing data

| FAST | | SLOW |
|---|---|---|
| 100:30 | Mix ratio by weight | 100:30 |
| 3:1 | Mix ratio by volume | 3:1 |
| Amber | Colour | Brown Tint |
| 23 min | Pot life | min 43 |
| 2:40 hrs:min | Tack free time | hrs:min 4:30 |
| 1263 cPs | Viscosity (A/B/Mixed @25C) | cPs 1100 |
| 1.10/ 0.99/1.07 | Component Density (@25C) | 1.10/ 1.00/1.09 |

**For technical support:**

Jordi Oliva
jordi@livingRconcept.com

Vadó Vila
vado@livingRconcept.com

R*CONCEPT

**Technologies** bonded by **respect** & driven by **values**

**REDUCE** Lower your **carbon footprint.**

**REPAIR** **Repair solutions**, tips, services and kits.

**RECYCLE** **End-of-life solutions** for the composite industry.

**REUSE** **Upcycling materials** for new performing composites.

**RESPECT**

Respect for all stakeholders in the composites industry, the environment, humans & the planet as a whole.

R*CONCEPT
**livingRconcept.com**
**weR@livingRconcept.com**
**+34 934 874 015**

innovation forward

https://www.pecepoxy.co.uk/shop/epoxy/

# Polyurethane coatings

innovation forward

# Pyran

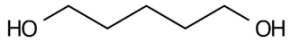
BIOBASED PENTANE DIOL (PDO)

## Bio 1,5 Pentanediol (PDO)

CAS: 111-29-5
EC: 203-854-4

- Safety data sheets (SDS)
- Technical data sheet (TDS)
- Brochure
- USDA BioPreferred® certificate
- 100% biobased content certificate

Registrations: TSCA, REACH

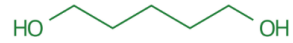



### Primary Market

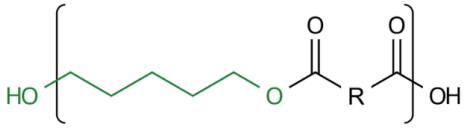
Pyran's 100% biobased 1,5 PDO is used in the CASE market to formulate polyester polyols, polycarbonate polyols, polyurethanes and acrylates.

Learn more about market applications

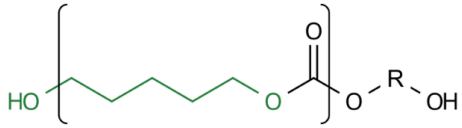
**Bio 1,5 Pentanediol (PDO)**




**Pyran's 100% biobased 1,5 PDO** is a cost-effective, value-added monomer in coatings, adhesives, sealants, and elastomers (CASE) applications such as polyester polyols, polycarbonate polyols, ultraviolet (UV) cure acrylates, and polyurethanes.

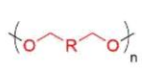
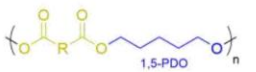
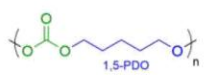
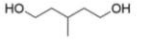



**PDO** in polyester polyols




**PDO** in polycarbonate polyols

- Pyran has proprietary process to produce renewable 1,5-pentanediol (1,5-PDO)
- 1,5-PDO replaces oil-based 1,6-hexanediol at 30% lower costs with enhanced properties in polyester and polycarbonate polyols
- Low-cost 1,5-PDO enables breakthrough in polycarbonate polyols as higher-quality replacement to polyesters/ethers

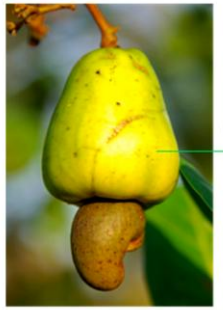
| | Polyether Polyol | Polyester Polyol | Polycarbonate Polyol |
|---|---|---|---|
| |  |  |  |
| **Heat Stability:** | Poor | Good | Excellent |
| **Chemical Stability:** | Poor | Fair | Good |
| **Hydrolysis Stability:** | Good | Poor | Excellent |
| **Cost:** | Low | Moderate | High |
| | Oil-based 1,5-PDO | Oil-based 3MPDO | Oil-based 1,6-HDO | Renewable 1,5-PDO |
| **Monomers:** |  |  |  |  |
| **Price:** | $6000/ton | $5000/ton | $4500/ton | <$3000/ton |

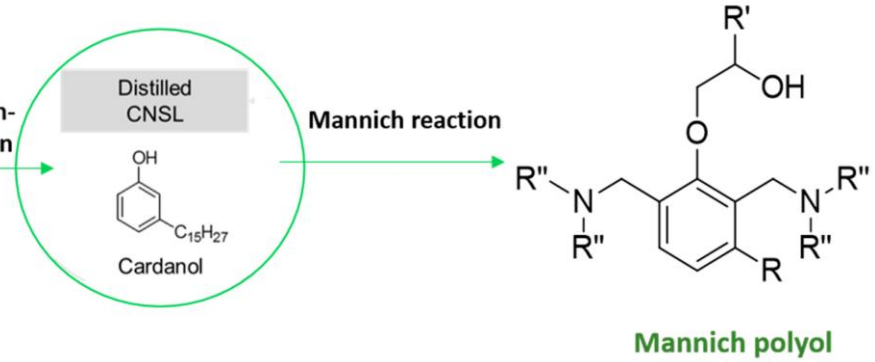
innovation forward

https://www.pyranco.com/applications

# Cardolite

POLYOLS AND OTHERS






- Different from other renewable polyols from soy and castor oil, CNSL polyols have an aromatic structure with excellent thermal resistance and chemical resistance to acid and alkaline solutions.
- The combination of aromaticity and long aliphatic chain delivers hydrolytic stability and mechanical strength to CNSL-based polyols.
- Fast curing at low temperatures
- High crosslinking density and autocatalytic functionality (spray-coating)
- Fire-retardant capabilities
- Water repellent (hydrophobic) and good barrier properties
- Good substrate adhesion and abrasive resistance

Cardolite
Chemistry for Tomorrow

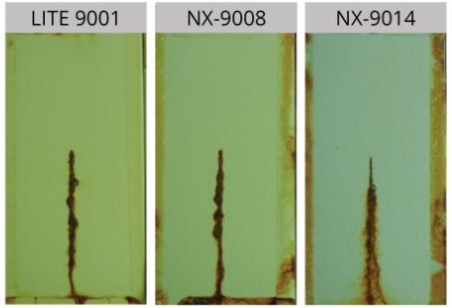
**Polyols, Diols and NCO Blocking Agents**

Cardolite offers multiple renewable solutions for polyurethane formulators. CNSL-based polyols have unique qualities compared to widely known polyester and polyether polyols, and other natural oil based polyols. They are very hydrophobic because of the long aliphatic chain of cardanol, which results in excellent water resistance and less moisture sensitivity during cure with isocyanate for increased durability of the final polyurethane system.

CNSL-based diols combine the benefits of CNSL and polyester technologies resulting in excellent solvent, alkaline, acid, and water resistance, and good dimensional stability. They can be formulated as binders or as a building block for prepolymers. Moreover, Cardolite's very high purity cardanol developed via a proprietary process technology is an excellent non-toxic alternative to phenol and nonyl phenol isocyanate blocking agents offering good deblocking conditions and excellent stability at room temperature.

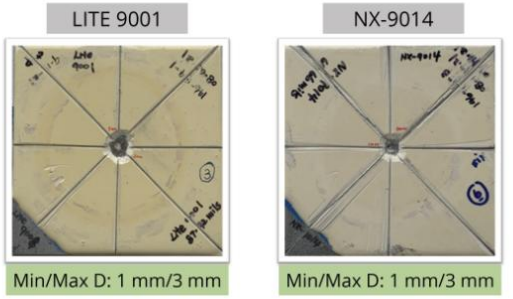
High purity and light color cardanol, NX-2026, is an effective isocyanate blocking agent that can be used to replace petro-based phenols. NX-2026 blocked NCO systems should be lower in viscosity and require lower deblocking temperatures than phenol. Moreover, cardanol can act as a flexibilizer in the final matrix.

800 HOURS SALT SPRAY: BIOBASED POLYOLS PERFORMANCE IN PU ANTICORROSION COATINGS




All three biobased polyols provide excellent anti-corrosion properties on cold rolled steel (DFT ~90 µm).

CATHODIC DISBONDMENT RESISTANCE OF OUR BIOBASED POLYOLS AFTER 42 DAYS AT RT




LITE 9001 and NX-9014 exhibited excellent cathodic disbondment resistance in solvent-free polyurethane protective coatings.

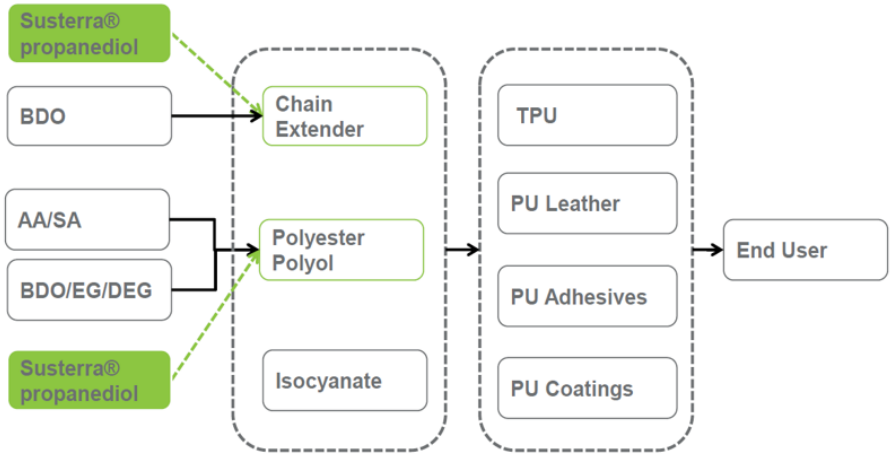
innovation forward

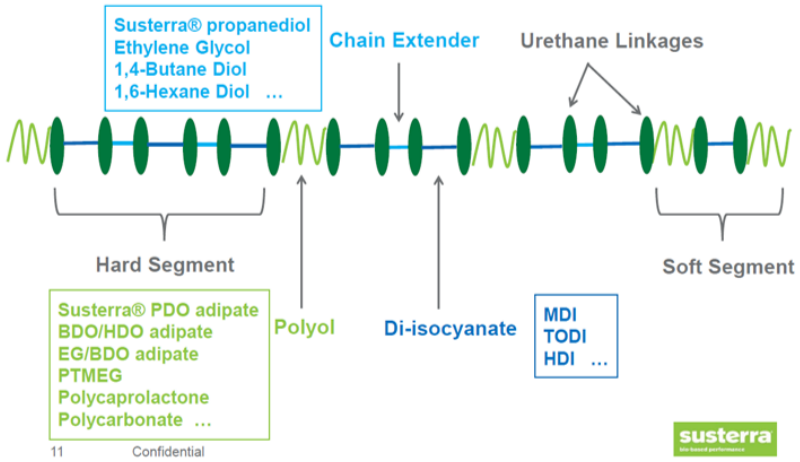
https://www.cardolite.com/polyols-diols/

# Primient Covation

## Polyurethane Production

Susterra® propanediol can be used as a chain extender or polyol




11 Confidential

## Susterra® Propanediol

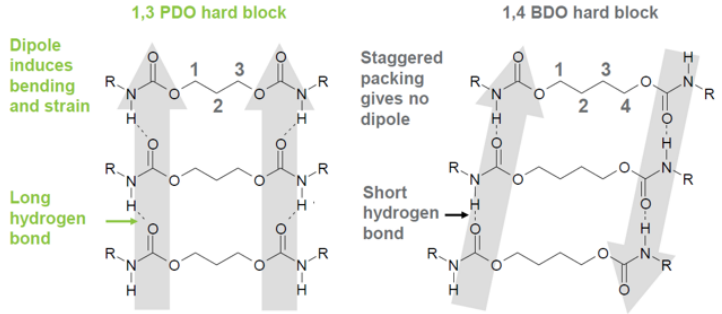
USDA CERTIFIED BIOBASED PRODUCT PRODUCT 100%

**How is it made?**

- Made by a fermentation process derived from glucose
- Made in the USA
- USDA 100% Certified Bio-Based Product

| Common | Ingredient | CAS# | Formula | Structure | MW | BP, °C | MP, °C | Density |
|---|---|---|---|---|---|---|---|---|
| Ethylene Glycol | 1,2-Ethanediol | 107-21-1 | C2H6O2 | | 62.1 | 197.6 | -12.7 | 1.116 |
| Propylene Glycol | 1,2-Propanediol | 57-55-6 | C3H8O2 | | 76.1 | 187.3 | -60 | 1.038 |
| Propanediol | 1,3-Propanediol | 504-63-2 | C3H8O2 | | 76.1 | 214 | -24 | 1.053 |
| MPDiol | 2-Methyl-1,3-Propanediol | 2163-42-0 | C4H10O2 | | 90.1 | 221 | -91 | 1.015 |
| 1,4 BDO | 1,4-Butanediol | 110-63-4 | C4H10O2 | | 90.1 | 230 | 16 | 1.017 |
| Neopentyl Glycol | 2,2-Dimethyl-1,3-Propanediol | 126-30-7 | C5H12O2 | | 104.1 | 208 | 127 | ~1.05 |
| DEG | Diethylene Glycol | 111-46-6 | C4H10O3 | | 106.1 | 245 | -10 | 1.118 |
| Hexylene Glycol | 2-Methyl-2,4-Pentanediol | 107-41-5 | C6H14O2 | | 118.2 | 197 | -40 | 0.925 |
| DPG | Dipropylene Glycol | 25265-71-8 | C6H14O3 | | 134.17 | 231 | | 1.023 |

**The odd even effect varies the packing of the hard block segments, and results in unique mechanical properties of the final product.**




innovation forward

https://primientbiopdo.com/ https://www.primientproducts.com/brands/susterra

# Emery

## BIOBASED POLYOLS

# EMEROX® Polyols for Coatings, Adhesives, Sealants & Elastomers

Ep Eco-Friendly Polyols

EMEROX renewable polyester polyols are excellent raw materials for use in the manufacture of coatings, adhesives, sealants and elastomers for applications including siding, carpet adhesive, floor cement coating and shoe soles.

They offer unique performance characteristics for CASE applications, including:

- Hydrophobic backbone with excellent chemical and moisture resistance
- Superior low temperature performance (low Tg)
- Low moisture absorption and moisture vapor transmission properties
- Improved solvent resistance, especially polar solvents
- Improved adhesion properties in adhesive and coating systems
- Excellent resistance to oxidation and UV
- Ease of use — not shear thinning
- Engineered to perform similar to petrochemical polyols
- Offering high bio-based content from 69-99%, depending on grade

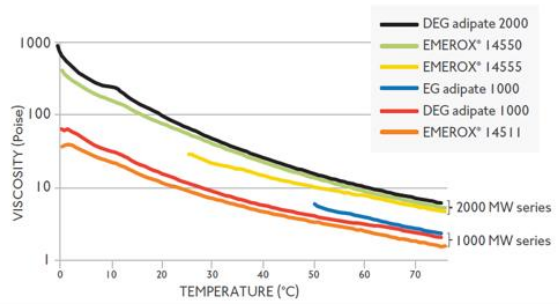
| PRODUCT NAME | HYDROXYL VALUE | VISCOSITY CP @25°C | ACID VALUE | FUNCTIONALITY (CALCULATED) | BIO-BASED CONTENT | DESCRIPTION |
|---|---|---|---|---|---|---|
| EMEROX® 14511 | 110 | 1,500 | ≤ 1.5 | 2.0 | 78* | General purpose, 1,000 molecular weight, linear diol polyol based on ethylene glycol (EG) azelate chemistry. |
| EMEROX® 14535 | 355 | 400 | ≤ 1.5 | 2.0 | 69* | Low viscosity, short chain linear diol based on ethylene glycol (EG) azelate chemistry. |
| EMEROX® 14550 | 50 | 6,000 | ≤ 1.5 | 2.0 | 82* | General purpose, 2,200 molecular weight, linear diol polyol based on ethylene glycol (EG) azelate chemistry. |
| EMEROX® 14555 | 50 | Waxy solid (500 Cp @ 75°C) | ≤ 1.5 | 2.0 | 82* | A 2,200 molecular weight, linear diol polyol based on ethylene glycol (EG) azelate chemistry. More hydrophobic than EMEROX® 14550. |
| EMEROX® 14637 | 370 | 1,700 | ≤ 1.5 | 2.7 | 99* | Low molecular weight branched azelate polyol targeting coating and adhesive applications. |
| EMEROX® 14801 | 105 | 2,600 | ≤ 1.5 | ~2.2 | 90** | A 1,000 molecular weight, EG dimerate polyol for applications where highly hydrophobic characteristics are required. |
| EMEROX® 14803 | 55 | 16,000 | ≤ 1.5 | ~2.2 | 90** | A 2,200 molecular weight, EG dimerate polyol for applications where highly hydrophobic characteristics are required. |

*USDA Certified Biobased Product.
**Bio-based content is an estimate, pending final testing.

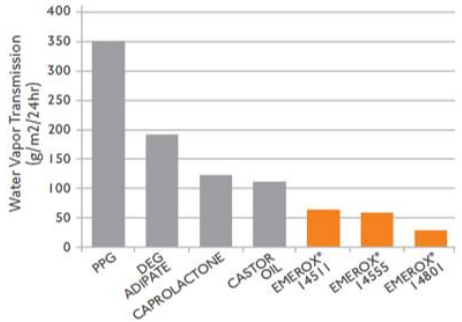
## Typical Product Characteristics

### Viscosity Profile

EMEROX® Polyols have a lower viscosity than similar EG or DEG adipate polyols.




### Water Vapor Transmission




*ASTM D1653-13 Proc. B. 2 mils/22°C /50% RH

## Unfilled Model Coating Example*

### Composition

| RAW MATERIAL | WT % |
|---|---|
| EMEROX® 14511 | 37 |
| EMEROX® 14637 | 55 |
| Crosslinker | 5 |
| Surfactants | 1.5 |
| Silane | 1 |
| Catalyst | 0.1 |
| Stabilizer | 0.4 |
| Total | 100 |
| HDI Trimer | 100.1 |

### Coating Characteristics

| PROPERTY | RESULT |
|---|---|
| Set time at RT | 10 hr |
| Tack-free time @ RT | 24 hr |
| Pencil hardness | 3B |
| MEK double rub, 50x | pass |
| Pull off adhesion, ground steel | >550 psi |
| Pull off adhesion, blasted steel | >600 psi |
| Pull off adhesion, smooth aluminum | >300 psi |
| Gloss, 20° | 50 |
| Gloss, 60° | 100 |
| Gloss, 85° | 75 |
| QUV, 3000 hrs gloss ret. | 99+% |

### Application

Spray applied 2k, direct to metal, diluted with 50% MEK

## Glass Transition Temperature (Tg) and Hansen Solubility Parameters

| POLYOL | Tg °C | HANSEN SOLUBILITY PARAMETERS $\delta_D$ | $\delta_P$ | $\delta_H$ | $R_0$ |
|---|---|---|---|---|---|
| EMEROX® 14511 | -57 | 17.0 | 9.0 | 7.2 | 8.0 |
| EMEROX® 14535 | -55 | 16.7 | 9.4 | 10.8 | 13.1 |
| EMEROX® 14550 | -51 | 17.0 | 9.0 | 7.2 | 8.0 |
| EMEROX® 14555 | -54 | 17.0 | 9.0 | 7.2 | 8.0 |
| EMEROX® 14637 | -56 | 16.6 | 9.9 | 11.4 | 8.0 |
| EMEROX® 14801 | -58 | 16.7 | 5.8 | 7.9 | 8.9 |
| EMEROX® 14803 | -58 | 16.7 | 5.8 | 7.9 | 8.9 |

## Chemical Resistance: 24 Hr Spot Test

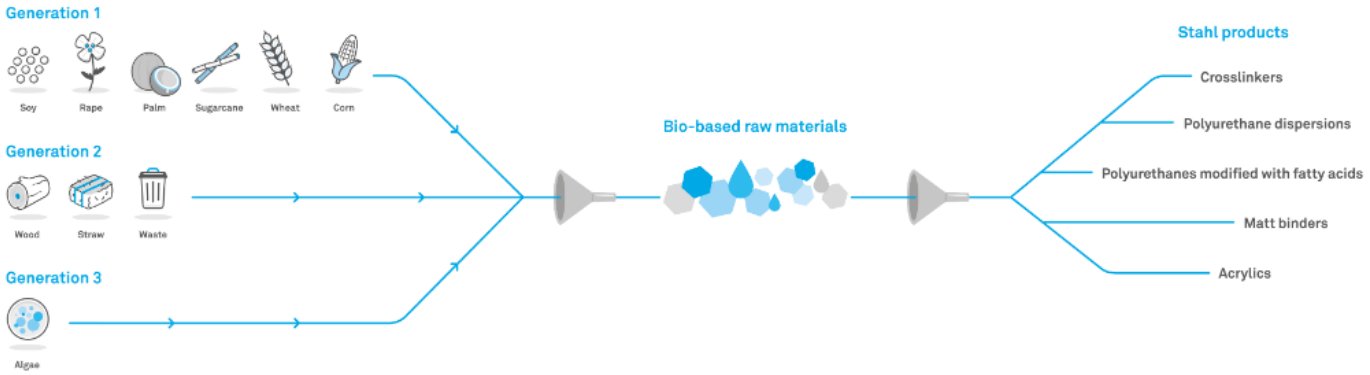
- Excellent resistance to: aliphatic and aromatic hydrocarbons, gycols, water, polar aprotic solvents, bleach
- Good resistance to: caustic, chlorinated solvents, DEET, suntan lotion, weak acids
- Not recommended for: strong or concentrated mineral acids

innovation forward

https://www.emeryoleo.com/eco-friendly-polyols/coatings-adhesives-sealants-elastomers

# Stahl

POLYETHER POLYOL AND POLYESTER POLYOL





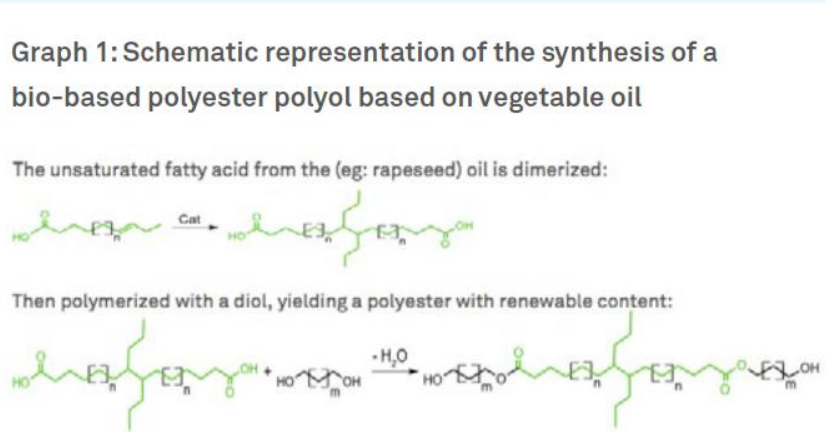


## RELCA® and PICASSIAN®

Water-based polyurethanes have become the standard for high-performance leather finishing. Polyurethane films are both durable and flexible and they protect the leather from staining, abrasive damage and the long term effects of weathering.

After extensive testing, the conclusion is that polyurethane films made with the latest bio-based polyester technology are more resilient to hydrolysis than previously studied bio-based polyesters. Indeed, the properties come close to the level of polycarbonate-based polyurethanes, which are considered to be the gold standard for automotive finishing.

## Polyether polyol and polyester polyol




innovation forward

https://www.stahl.com/performance-coatings-brands/relca

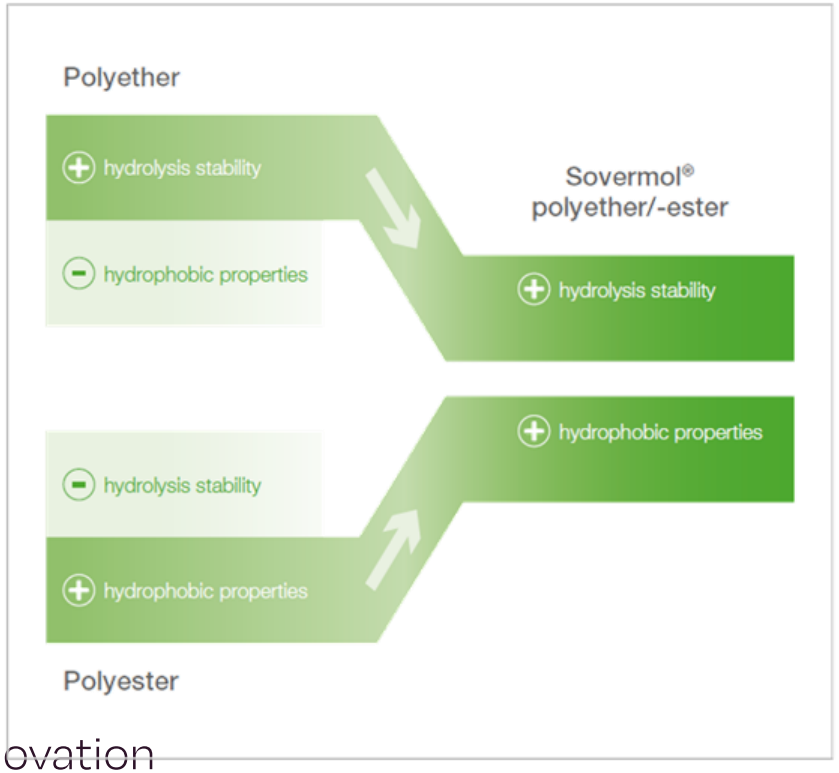
# BASF

POLYOL GRADES

## Performance-driven polyols for 2K PU systems based on natural oil

Sovermol® by BASF

Sovermol® – a chemical "hybrid" combining two singular good properties in one molecule




BASF's Sovermol® range of green polyols has been specially designed for use in coating, adhesive and putty applications. These natural oil-based polyols help you to comply with environmental standards while meeting even the toughest production regulations. What's more, improving the environmental profile of your processes will make you more attractive to both existing and new customers. Sovermol® is part of our 2K PU offering containing the crosslinker (Basonat® – NCO) and acrylic polyol (Joncryl®).

| Product | Renewable raw material content | Type | Functionality | Medium OH-value | Medium OH-equivalent weight | Medium viscosity mPa·s (25 °C) | Applications / properties |
|---|---|---|---|---|---|---|---|
| Sovermol® 45 | | branched polyether | 4.0 | 570 | 98 | 3,000 | co-polyol for floorings (combined with Sovermol® 750 UV stable), adhesives and casting materials<br>• improvement of glass transition temperature Tg<br>• high cross-linking density<br>• hydrophilic<br>• improvement of chemical resistance |
| Sovermol® 100 | | branched polyether | 3.0 | 880 | 64 | 6,000 | co-polyol for floorings (combined with Sovermol 750 UV stable), adhesives and casting materials<br>• improve glass transition temperature Tg<br>• high cross-linking density, hydrophilic<br>• improvement of chemical resistance<br>• drinking and potable water application possible upon product specific confirmation according to local legislation |
| Sovermol® 320 | ■■■■ | branched polyether | 2.8 | 310 | 180 | 1,000 | • drinking and potable water application possible upon product specific confirmation according to local legislation<br>• high shore D hardness (D~80)<br>• good mechanical properties |
| Sovermol® 650 NS | ■■■■ | dimer diol/ trimer triol | 2.2 | 190 | 295 | 3,900 | polyol for solvent-based printing inks<br>• high saponification stability<br>• tear resistance |
| Sovermol® 750 | ■■■ | branched polyether/-ester | 3.0 | 315 | 178 | 1,100 (20 °C) | polyol for UV stable and weathering resistant coatings and floorings<br>• high shore D hardness (D~80)<br>• hydrophobic<br>• high saponification stability<br>• excellent chemical resistance<br>• hydrolysis stable<br>• high Tg-polyol |
| Sovermol® 760 | ■■■ | branched polyether/-ester | 3.5 | 390 | 145 | 2,300 | polyol for UV stable and weathering resistant coatings and floorings<br>• high shore D hardness (D~90)<br>• hydrophobic<br>• high saponification stability<br>• excellent chemical resistance<br>• hydrolysis stable<br>• extremely high Tg-polyol<br>• high heat resistance |

■■■■ 80 - 100 %  ■■■ 65 - 80 %  ■■ 50 - 65 %  ■ 30 - 50 %

| Product | Renewable raw material content | Type | Functionality | Medium OH-value | Medium OH-equivalent weight | Medium viscosity mPa·s (25 °C) | Applications / properties |
|---|---|---|---|---|---|---|---|
| Sovermol® 805 | ■■■ | branched polyether/-ester | 3.5 | 170 | 330 | 3,500 | universal polyol<br>• excellent impact resistance<br>• shore D hardness (D~70) |
| Sovermol® 810 | ■■■ | branched polyether/-ester | 3.3 | 230 | 244 | 900 | polyol for encapsulation systems<br>• hydrolysis stable<br>• hydrophobic<br>• low viscosity<br>• high filler content possible |
| Sovermol® 815 | ■■■■ | branched polyether/-ester | 3.5 | 215 | 260 | 1,600 | low viscosity universal polyol<br>• binder for pigment pastes<br>• crack-bridging floorings<br>• good chemical resistance<br>• hydrophobic<br>• good elastic memory effect |
| Sovermol® 818 | ■■■■ | fatty-chemistry polyester | 2.6 | 236 | 238 | 750 | low viscosity universal polyol<br>• extremely hydrophobic<br>• good self-leveling properties<br>• excellent flexibility at temperatures below 0 °C<br>• good bonding properties |
| Sovermol® 819 | ■■■■ | fatty-chemistry polyester | 2.6 | 240 | 234 | 850 | low viscosity universal polyol<br>• extremely hydrophobic<br>• good self-leveling properties<br>• good bonding properties<br>• drinking and potable water application possible upon product specific confirmation according to local legislation |
| Sovermol® 860 | ■■■■ | aliphatic polyol | 2.5 | 210 | 270 | 530 (20 °C) | • gel time prolonger<br>• reactive diluent<br>• hydrophobic<br>• good adhesive properties on metal surfaces<br>• contains epoxy groups (EpO = 0.3 to 0.4 %) |
| Sovermol® 908 | ■■■■ | aliphatic dimer alcohol | 2.0 | 206 | 272 | 2,300 | • crack-bridging coatings<br>• good saponification stability<br>• hard elastic performance<br>• hydrophobic |
| Sovermol® 920 | | polycarbonat diol | 2.0 | 55 | 1,020 | 9,500 | • for TPU applications |
| Sovermol® 1005 | ■■■■ | slightly branched aliphatic diol | 2.2 | 122 | 460 | 800 (20 °C) | • hydrophobic<br>• plasticizer for polyol<br>• soft elastic performance<br>• drinking and potable water application possible upon product specific confirmation according to local legislation |
| Sovermol® 1006 | | polyester diol | 2.0 | 60 | 935 | 8,000 (20 °C) | co-polyol for performance driven PU coatings (e.g. sports floor), elastomers and sealants<br>• good hydrolysis stability<br>• soft elastic performance |

innovation forward

# BASF

## RENEWABLE POLYOL GRADES

## SOVERMOL®

Our SOVERMOL line of natural-oil polyols, derived from renewable raw materials like rapeseed oil and castor oil, typically contains 80-100% bio-content. These products offer excellent resistance to hydrolysis, chemicals, UV degradation, and long-term weathering performance. These properties allow for a reduced carbon footprint both within the coating formulation and in the long-lasting performance of the finished coating.

**Key features and benefits**

- Bio-based
- 100% system
- Solvent-Free
- Hydrophobic
- Chemical Resistance
- Non-reactive Diluent
- Elastic Performance
- UV-Stable

**Applications**

- ACE
- Industrial Coatings
- Transportation Coatings
- Marine Coatings
- Protective & Maintenance
- Pipe Coatings
- Wind Power Coatings
- Automotive Refinish

### Co-Polyol Binder

- SOVERMOL 100
  A branched polyether polyol used in the manufacturing of polyurethanes.
- SOVERMOL 100 N
  A branched polyether polyol used in the manufacturing of polyurethanes.
- SOVERMOL 1005
  A slightly branched aliphatic diol used in the manufacturing of polyurethanes.
- SOVERMOL 1006
  A polyester diol co-polyol used in the manufacturing of polyurethanes.
- SOVERMOL 1102
  A slightly branched polyether/polyester used in the manufacturing of UV-stable polyurethanes.

### Polyol Binder

- SOVERMOL 1014
  An aliphatic triol used in the manufacturing of polyurethanes.
- SOVERMOL 1055
  A fatty acid ester with epoxy groups.
- SOVERMOL 1058
  A fatty acid ester, non-reactive diluent used in the manufacturing of 1K and 2K polyurethane systems.
- SOVERMOL 1092
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 1093
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 1140
  A fatty chemistry polyester used in the manufacturing of polyurethanes.
- SOVERMOL 750
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 760
  A branched polyether/polyester used in the manufacturing of UV-stable polyurethanes.
- SOVERMOL 780
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 805
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 815
  A branched polyether/polyester used in the manufacturing of polyurethanes.
- SOVERMOL 818
  A fatty chemistry polyester used in the manufacturing of polyurethanes.

### Non-reactive Diluents

- SOVERMOL 1055
  A fatty acid ester with epoxy groups.
- SOVERMOL 1058
  A fatty acid ester, non-reactive diluent used in the manufacturing of 1K and 2K polyurethane systems.

# Lubrizol

TPU for HMPUR formulations and hot-melt adhesives:

| Product | Percentage of bio-based content* | Comments |
|---|---|---|
| Pearlbond™ ECO 590 | 67% | Extremely high crystalization rate and very high thermoplasticity. Additives for HMPUR. Applied by extrusion and sintering |

TPU for injection molding and extrusion:

| Product | Percentage of bio-based content* | Hardness | Comments |
|---|---|---|---|
| ESTANE® ECO 12T80E | 43% | 82 Shore A | Food-contact grade |
| ESTANE® ECO 12T85 | 46% | 85 Shore A | UV-stabilized and good hydrolysis resistance |
| ESTANE® ECO 12T90E | 37% | 91 Shore A | Food-contact grade |
| ESTANE® ECO 12T95 | 32% | 95 Shore A | UV-stabilized |
| ESTANE® ECO 12T55D | 29% | 55 Shore D | Easy-to-extrude and good hydrolysis resistance |

*Bio-based content as determined according to ASTM-D6866.

Our latest development is ESTANE® 3D TPU F95A-030 BR ECO for additive manufacturing. It has a broad printing window and is used in fused filament fabrication.

## PRODUCTS

### Pearlbond™ ECO TPU

Pearlbond™ ECO TPU is Lubrizol's bio-based TPU with high renewable material content and high thermoplasticity. Pearlbond can be added to reactive hot-melt (HMPUR) formulations to improve crystallization speed and is also used for hot-melt adhesives in heat-sealable fabrics and in toe puffs and counters.

### ESTANE® ECO TPU

This TPU is a bio-based line of polymers made with renewable material content from 29% of total mass (previously known as Pearlthane™ ECO TPU). These resins can be processed through injection molding and extrusion and offer a low density as compared to their petroleum-based counterparts.

## APPLICATIONS

**Industrial**
- Hoses
- Timing belts
- Automotive interior parts
- Textile coatings for shoe stiffeners (toe puffs and counters)
- Formulations of reactive polyurethane hot melts (HMPUR)
- Various molded parts
- Housing/Overmolded grips

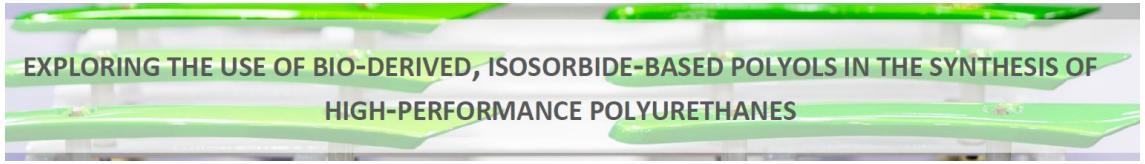
**Sports & Recreation**
- Footwear
- Goggles
- Watchbands
- Sports equipment

**Electronics**
- Smartphones
- Headphones
- Consumer goods and appliances

*Bio-based content as determined according to ASTM-D6866.

# Roquette

ISOSORBIDE-BASED POLYOL




Isosorbide is a plant-derived, renewable feedstock made at an industrial scale to very high purity (POLYSORB®) by Roquette (Lestrem, France), a global leader in plant-based ingredients. The new polyols have been shown to deliver enhanced PU performance as well as fulfilling requirements for renewable/sustainable feedstocks.

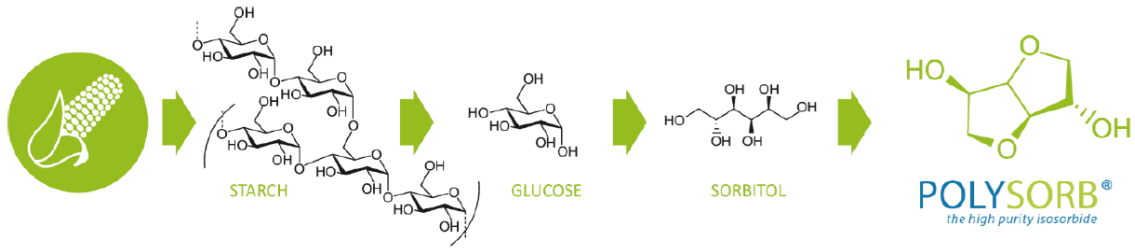
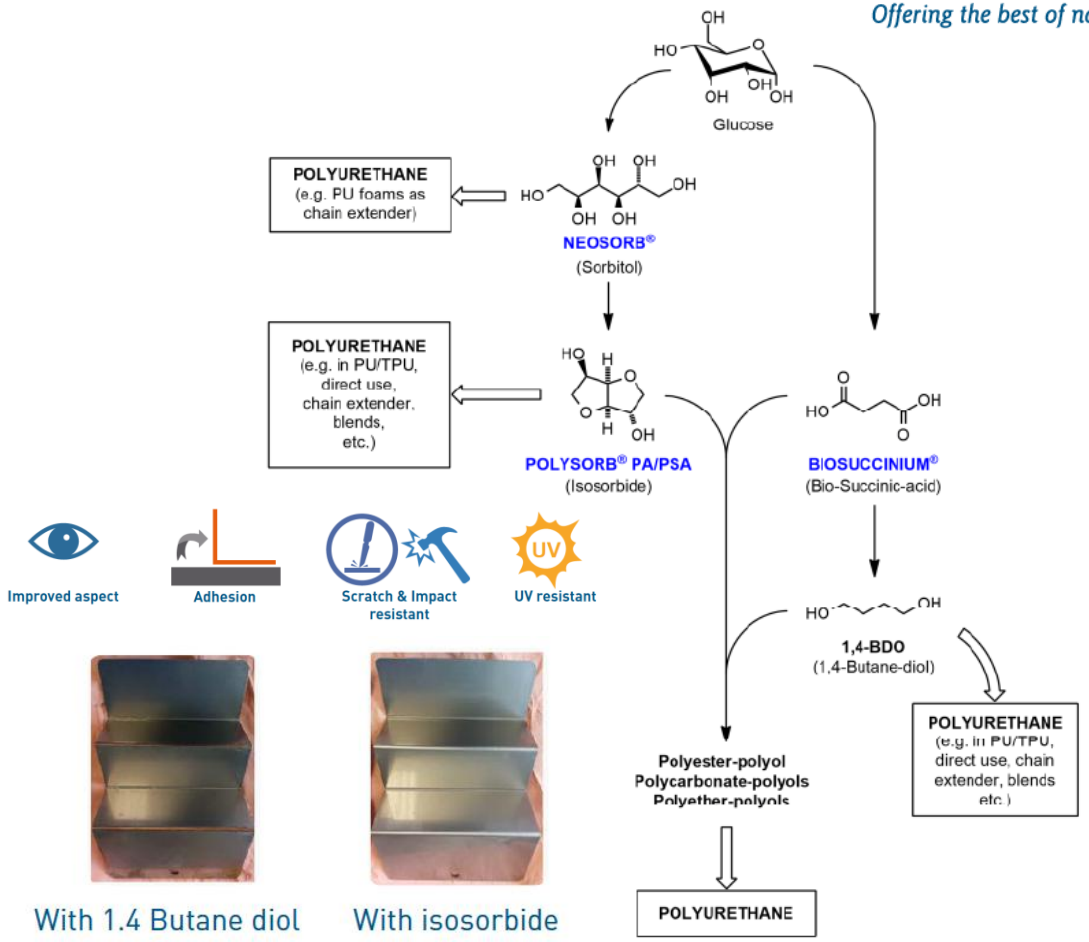



Figure 1: Isosorbide is a versatile, sustainable monomer for polymer manufacture, made from renewable plant feedstocks.




**POLYSORB® isosorbide is a low molecular weight diol that can play a range of different role in PU chemistry. [NEOSORB® sorbitol and BIOSUCCINIUM® bio-succinic acid are additional products from the Roquette portfolio that PU chemists can use to synthesize more sustainable materials in polyurethanes**

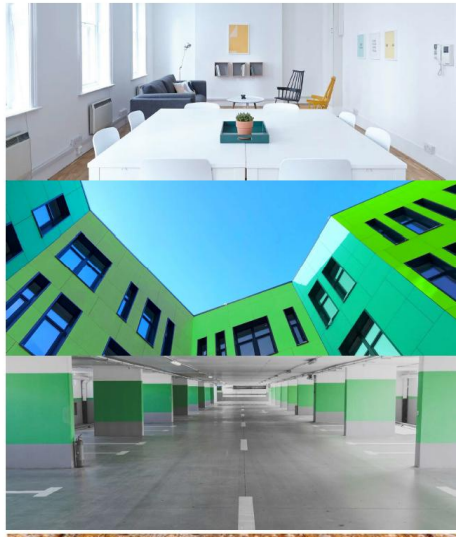
innovation forward

https://www.roquette.com/bioindustry/ingredients/polysorb-isosorbide

# Alberdingk Boley

## Dispersions

- Water-based polyurethane- and acrylic dispersions, UV-curable dispersions for coatings and adhesives
- Water-based dispersions for building & construction paints, architectural coatings and plasters
- VOC-free 100% polyols based on renewable raw materials for two-pack PU applications



## Natural oils

**Linseed oil and derivatives**

- Printing inks
- Alkyd resins
- Paints and varnishes

**Castor oil and derivatives**

- PU-coatings, adhesives and sealants
- Pharmaceutical and cosmetic products
- Lubricants



**100% Polyols & Oil-Polymers**

| Raw Material Base | Product | Renewable Content [% on solids] | Application | Characterisation |
|---|---|---|---|---|
| Castor Oil | ALBODUR® Products | 60 - 95 | Miscellaneous | |
| | All ALBODUR® grades contain up to 95% renewable resources | | | |
| Linseed Oil | ALBERDINGK® OP 100 | 88 | Flooring / furniture | For penetration into wood |
| | ALBERDINGK® OP 105 | 100 | Flooring / furniture | For penetration into wood |

### New ALBERDINGK® products based on dedicated renewables

ALBERDINGK BOLEY is constantly working on the development of novel castor and linseed oil based dispersions as well as polyols for various applications such as e.g. leather finish, textile coatings, architectural paints, construction, printing and packaging.

### Enhance portfolio based on bio-based polyols by the use of dedicated raw materials

Many polyurethane dispersions can immediately be produced based on polyols which are manufactured from biological sources instead of mineral oil.

The following ALBERDINGK® PUDs can be offered in a bio-based version upon request (renewable content: 57-68% on solids):

**ALBERDINGK® Ren-U 228** **ALBERDINGK® Ren-U 400 N**

**ALBERDINGK® Ren-U 4000**

Additionally possible:

**ALBERDINGK® Ren-U 4101** **ALBERDINGK® Ren-U 3200**

https://www.alberdingk-boley.de/en/Products/Polyols/

# Alberdingk Boley

BIOBASED POLYOLS FROM CASTOR OIL



## Polyols based on renewable resources

With our castor oil based ALBODUR® products you will be able to produce a huge variety of surface coatings – from elastic up to extremely hard surfaces, as well as high class decorative coatings. Homogeneous curing makes it possible to achieve very high coating thicknesses. In comparison to standard products, ALBODUR® has a significantly greater chemical resistance as well as increased hydrophobicity. The high percentage of renewable raw materials allows you to formulate your products in a sustainable way.

| Name | Elongation | OH-content as supplied (%) | Renewable content on solids | Shore-A hardness | Shore-D hardness | Viscosity (Cone-Plate) (mPas) |
|---|---|---|---|---|---|---|
| **ALBODUR® 906**<br>Polyols | 125 | 5.18 | 65 | 70 | 20 | 400 - 600 |

https://www.alberdingk-boley.de/en/Products/Biobased/

# Cargill

BIOBASED POLYOLS

Good adhesion to low polarity substrates

Thermo-oxidative and hydrolysis resistance for long lasting durability

Improved moisture resistance, also achieved for PU dispersions

Up to 100% bio-based content with USDA BioPreferred and ISCC PLUS certifications

100% bio-based grades

**Priplast 3237**

100% bio-based* versatile all around building block, 1000 Mw, amorphous (liquid at room temperature) and 2 Gardner color.

**Priplast 3238**

100% bio-based* versatile all around building block, 2000 Mw, amorphous (liquid at room temperature) and 2 Gardner color.

**Priplast 3239**

100% bio-based* versatile all around building block, 3000 Mw, amorphous (liquid at room temperature) and 2 Gardner color.

**Priplast 3291**

100% bio-based* versatile all around building block, 1000 Mw, semi-crystalline (waxy solid at room temperature) and 2 Gardner color.

**Priplast 3294**

100% bio-based* versatile all around building block, 2000 Mw, semi-crystalline (waxy at room temperature) and 2 Gardner color.

**Priplast 3295**

100% bio-based* versatile all around building block, 3000 Mw, semi-crystalline (waxy solid at room temperature) and 2 Gardner color.

## Priplast™ polyols: Enabling high-performance bio-based PUDs

Cargill's Priplast™ polyester polyols enable energy-saving, low-VOC waterborne PUDs with versatile adhesion to metals, plastics & wood. Despite hydrophobicity, NMP-free formulations are possible, meeting evolving regulatory standards.

**Download the technical presentation to explore:**

- Superior hydrophobicity
- Extreme flexibility and chemical resistance
- Outstanding adhesion to a variety of substrates



innovation forward

https://www.cargill.com/bioindustrial/priplast-polyols

# Polylabs

## Bio polyols from 2nd generation feedstocks

We produce high-quality bio polyols from forest industry by-products and recycled natural oils. Marketing departments have stretched the meanings of words “bio” and “green” and will find new ways to label products under the green flag. We can proudly say that our bio polyols are true to their word and contain up to 96% bio content and down to -0,89 kgCO2/kg!

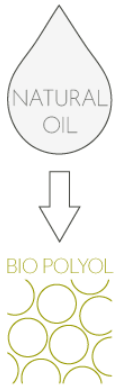
| Product | $CO_2$ footprint $kgCO_2/kg$ * | Bio carbon content | OHV, mgKOH/g | Viscosity, mPa*s | Avg. MW, Da | Acid number, mgKOH/g | Functionality | Water, % | Structure |
|---|---|---|---|---|---|---|---|---|---|
| **UPT FX 75** | 1.17 | 61% | 65-85 | 1350-1750 | 1400 - 1600 | <5 | 2 | <0.2 | Linear |
| **UPT F 220** | 1.26 | 64% | 210-230 | 2500-2900 | 650-850 | <5 | 3 | <0.2 | Branched |
| **UPT 240** | 0.30 | 69% | 230-250 | 250-450 | 350-550 | <5 | 2 | <0.2 | Linear |
| **TT 350** | 0.01 | 70% | 340-360 | 300-400 | 260-470 | <5 | 2 | <0.2 | Linear |
| **TT 300** | (-0.13) | 72% | 290-310 | 130-190 | 300-500 | <5 | 2 | <0.2 | Linear |
| **EGT 265** | (-0.73) | 86% | 255-275 | 100-200 | 300-500 | <5 | 2 | <0.2 | Linear |

*The $CO_2$ footprint provided is based on a Cradle-to-Gate assessment, including raw material sourcing, transportation, and production emissions and it includes Biogenic $CO_2$.

## Bio Polyols

Our Bio Polyols are high-quality products synthesized using forestry industry by-products and recycled natural oils that do not compete with the global food chain. The best use for these polyols is the production of rigid polyurethane foams for thermal insulation application as well as flexible foams for various applications.

Our Bio Polyols have high bio-carbon content ranging from 51% to 89% and a wide range of hydroxyl values from 65 to 410, making them ideal candidates for various rigid & flexible foam applications.




innovation forward

https://www.polylabs.eu/product-list/

# De Monchy

SUPPLIER OF BIO-BASED POLYOLS

DE MONCHY INTERNATIONAL

## Bio based Polyols

Bio-based polyols are a class of versatile chemicals used in the production of eco-friendly polyurethane and other polymer-based products. These polyols are derived from renewable feedstocks, reducing the carbon footprint and environmental impact associated with conventional petroleum-based polyols.

JAYANT AGRO-ORGANICS LTD.
Leadership through Innovation

### About our supplier

The Jayant Agro Group is a leading producer of chemicals derived from castor oil, offering an extensive range of products such as dehydrated castor oil and hydrogenated castor oil. With applications spanning diverse industries including agriculture, textiles, and electronics, Jayant's products are renowned for their versatility. De Monchy International proudly partners with Jayant, providing access to their high-quality products along with expert guidance and excellent service.

VITHAL CASTOR POLYOLS PVT. LTD.
An Indo-Japanese Joint Venture

### VITHAL CASTOR POLYOLS PRIVATE LIMITED

Vithal Castor Polyols is an Indo-Japanese joint venture between Jayant Agro-Organics Ltd., Mitsui Chemicals Inc. and Itoh Oil Chemical Co. Ltd. founded in 2013. This company is named after the founder of Jayant Agro - Late Mr. Vithaldas G. Udeshi. Vithal Castor Polyols will manufacture castor oil based bio-polyols having main applications in automobiles, furniture and packaging.
The partnership of the three companies who bring their own unique strengths to the table in India, where 80% of the world's castor oil are produced, will establish a stable supply base for a cost competitive bio-polyol.



https://monchy.com/products/bio-based-polyols/ https://www.jayantagro.com/company.php/PPYRO/

# Allnex

BIOBASED PUD – UV CURABLE

## RADCURE

| Product | Functionality | Viscosity cP @ 25 °C | Renewable Raw Material (wt%) 1) | Naturally Derived Carbon (%) 2) | Application | Product Description |
|---|---|---|---|---|---|---|
| **Waterborne Products** | | | | | | |
| UCECOAT® 7999 | n/a | <200 | 20 | 22 | 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. |

## LIQUID RESINS

| Product | Application | % Bio-based on resin solids | % Bio-based on delivery form | Performance caracteristics |
|---|---|---|---|---|
| **Water borne polyurethane dispersions** | | | | |
| DAOTAN® TW 1252/42WA | Topcoat, monocoat, air drying | 30% - 35% | 10% - 15% | High gloss, hardness. |
| DAOTAN TW 6440/43WA | Industrial wood | 30% - 40% | 10% - 20% | Behaves like a solvent borne system, quick hardness development and chemical resistance. |

## DAOTAN TW6440

**TYPE**

Polyurethane dispersion modified with drying fatty acids

**FORM OF DELIVERY (f.o.d.)**

42 % in water (42WA)
(containing also approxl. 2 % methoxy propoxy propanol)

**Content of fatty acids**

approx. 31 % special vegetable fatty acids (as triglycerides)

**DEVELOPMENT PRODUCT**

**This product is serving for trial purposes only. Deviations which might occur during transfer into manufacturing in a commercial scale are possible and do not constitute any material defect.**

**Neutralization agent**

0.4 % ammonia, as salt

**SPECIAL PROPERTIES**

Very fast set and through drying. Very high gloss in decorative top coats together with high film hardness and good water and weather resistance. Free of organic amines.

## UCECOAT® 7999

be ECOWISE™

Tin-free and APEO-free energy-curable polyurethane dispersion with ~22% bio-carbon offering. Ideal for high hardness and durability for clear and white coats. The product has a low VOC with an easy film formation requiring no cosolvent. It presents a high reactivity for an increased productivity.

**UCECOAT® 7999** is a high performance Tin-free and APEO-free UV-curable polyurethane dispersion with a bio-based carbon content of minimum 20% (ASTM D 6866). Through the use of bio-based materials, UCECOAT 7999 is able to contribute to a better environment by reducing significantly and consistently its material carbon footprint*. Additional sustainability benefits of this product, such as lower VOC emissions and energy consumption, come from it being a UV-curable waterborne system.

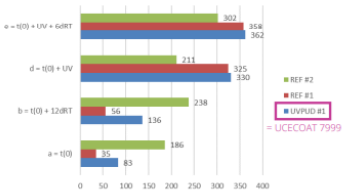
Radiation Curing + Waterborne + Bio Content = UCECOAT® 7999

**Typical wet properties**

| | UCECOAT® 7999 |
|---|---|
| Solid content (%) | ≈ 35 |
| Viscosity (mPa.s) | ≤ 200 |
| pH | ≈ 7.5 |
| Average particle size (nm) | ≤ 100 |
| MFFT (°C) | ≤ 5 |
| Stability @ 60°C (day) | > 10 |

**Kinetics of hardness development**

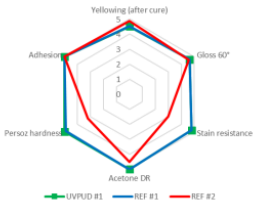
Persoz hardness as a function of aging and curing of dried coating (10 min. @ 50°C)




**Performance of UCECOAT 7999 - Clear & white formulations**

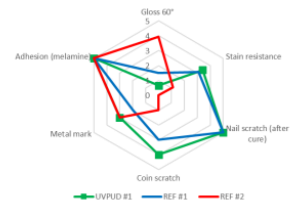
**As a CLEAR COAT for wood (see UVPUD #1)**

REF #1 = 0% bio-carbon, REF #2 = 38% bio-carbon




**As a WHITE COAT for wood (see UVPUD #1)**

REF #1 = 0% bio-carbon, REF #2 = 38% bio-carbon




innovation forward

https://allnex.com/en/product/1291e940-4ee4-4914-8d12-c6df568b82e4/ucecoat-7999

# Vencorex

BIO-BASED ISOCYANATE DILUENT

## Tolonate™ X FLO 100

**Description**

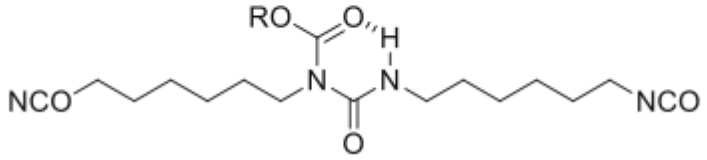
- Partially bio-based, solvent-free, extremely low viscosity aliphatic isocyanate polymer, based on Hexamethylene Diisocyanate (HDI).
- Contains 25% renewable material ,

  Certified by ACDV "Association Chimie Du Végétal" ⟹ 25%
- Tolonate™ X FLO 100 is supplied at 100 % solids and is designed to produce solvent-free polyurethane materials and/or to reduce volatile organic compounds (VOC) emissions of polyurethane formulations.

### Coatings with improved appearance and end properties

Tolonate™ X FLO 100 is particularly suitable in coating formulations, including waterborne polyurethane systems, to improve appearance of coatings (see graph 2) and end properties like adhesion on plastic substrates (see graph 3). It can partly or totally replace the solvent needed for the formulation of the polyisocyanate while keeping good emulsification properties.

**Tolonate™ X FLO 100 is a new, partially bio-based, solvent-free and low viscosity aliphatic isocyanate polymer.**




### …as reactive diluant

Tolonate™ X FLO 100 is miscible in all proportions with hydrophobic and hydrophilic polyisocyanates (See graph 1) while keeping their outstanding properties.

### …as building blocks

Thanks to its functionality (2 - 2.1) and its polymeric structure, Tolonate™ X FLO 100 is a suitable building block to design polyurethane acrylates (PUA) or polyurethane dispersions (PUD). Specific structure of Tolonate™ X FLO 100 will provide low viscosity PUA (see table 1)

### Elastomers with enhanced mechanical properties

Tolonate™ X FLO 100 shows an excellent compatibility with hydrophobic resins like Hydroxyl Terminated PolyButadiene and enables to improve the mechanical properties (elongation at break) of elastomers (see graph 4). Among other characterictics, Tolonate™ X FLO 100 leads to increased flexibility of crosslinked materials. When used as a co-crosslinker in PU systems, Tolonate™ X FLO 100 can modify the glass transition temperature range (Tg) of the final product (see graph 5) and influence positively mechanical properties such as scratch healing.

innovation forward

https://www.vencorex.com/product_category/tolonate/

# Mitsui

BIOBASED PENTAMETHYLENE DIISOCYANATE (PDI)

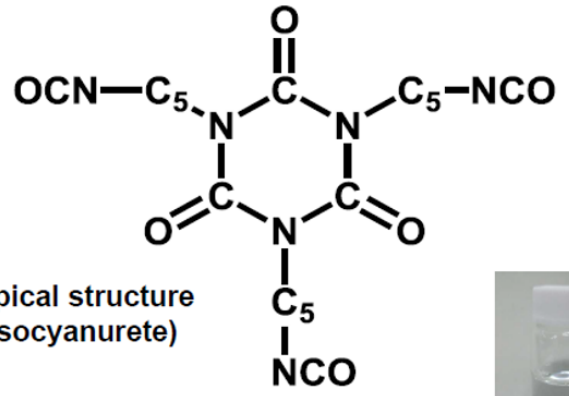
## STABiO™
**Bio-based aliphatic polyisocyanate and its hardener for coating and adhesive**

**High performance bio-based aliphatic polyisocyanate for polyurethane(PU) coating and adhesive**

| Features | Benefits -> Improve point | Compare with HDI |
|---|---|---|
| High Reactivity | - Short curing period<br>- Low drying temperature<br>-> CO2 emission<br>-> Environmental load<br>-> Production cost | ca.1.5-2 times high reactivity |
| High Isocyanate Content (NCO%) | - High performance PU<br>-> Chemical resistance<br>-> Abrasion resistance<br>- Decrease hardener amount<br>-> Weather resistance | ca.1.2 times Solvent Resistance<br>ca.10% low amount |
| Low Viscosity | - High solid content<br>-> Environmental load<br>- Superior smoothness<br>-> Appearance of coating film | ca.20% low viscosity |
| Aliphatic non-symmetric structure | - High transparency<br>- Good weather resistance<br>-> Appearance of coating film | High |
| Biomass | - Sustainable development | 70% vs 0% |




Pentane-1,5-diisocyanate
(STABiO™ PDI™)




Typical structure
(Isocyanurete)

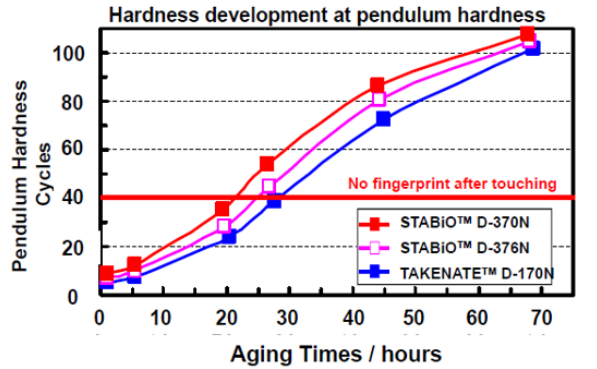


STABiO™ Hardener

- Good hardness development at same potlife with HDI system
- Shorter the aging time by 25% than HDI based system

| | STABiO™ D-370N | STABiO™ D-376N | HDI based TAKENATE™ D-170N |
|---|---|---|---|
| Workable time [1)] | 21hr | 25hr | 28hr |

Aging time at 40cycles pendulum hardness , which remains no fingerprint after touching.




innovation forward

https://eu.mitsuichemicals.com/en/service/product/stabio/index.htm

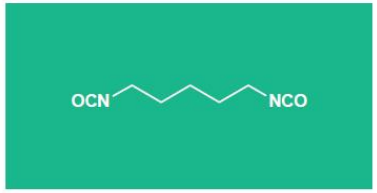
# Covestro

## BIOBASED PENTAMETHYLENE DIISOCYANATE (PDI)

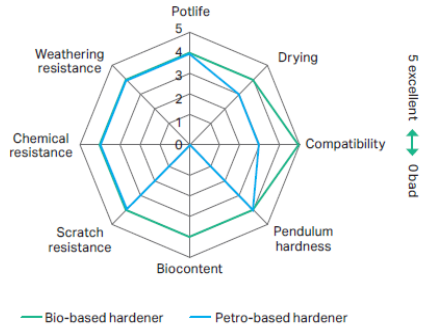
### Desmodur® eco N / Bayhydur® eco family

Two-component polyurethane bio-based coatings with excellent weatherability and resistance based on bio-based **pentamethylene diisocyanate (PDI)**.

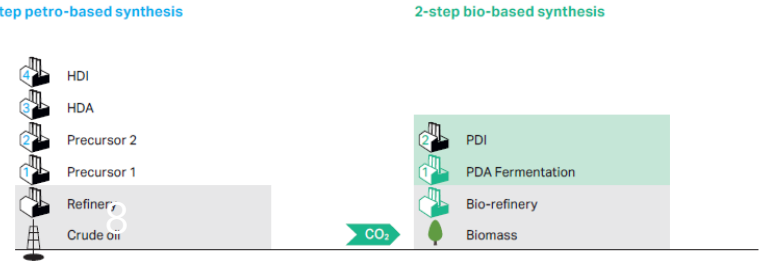





### Desmodur® eco N 7300




- **Bio-based** and significantly **improved carbon footprint** cradle-to-gate in comparison to HDI, based on Life-Cycle-Assessment studies conducted according to ISO 14040/14044 Standards.
- Bio-based process with significant improvement on **energy efficiency.**




**PDI-based crosslinker**

| | SUPPLY FORM APPROX. [%] | VISCOSITY AT 23°C APPROX. [mPa · s] | NCO CONTENT ON SUPPLY FORM APPROX. [%] | EQUIVALENT WEIGHT APPROX. | FUNCTIONALITY APPROX. | BIO-BASED CONTENT ON SUPPLY FORM [%]* | COMMENTS |
|---|---|---|---|---|---|---|---|
| Desmodur® eco N 7300 NEW | 100 | 9,500 | 21.5 | 195 | 3.7 | 71 | Contains renewable carbon. Outstanding weather stability and gloss retention, non-yellowing; for automotive OEM, automotive refinish, plastics and industrial coatings, structural coatings and topcoats. |
| Bayhydur® eco 701-90 NEW | 90 in PGDA | 5,000 | 17.9 | 232 | 3.6 | 61 | Ionically modified (sulfonic acid) crosslinker for 2K WB coatings containing renewable carbon. Highest chemical resistance, easy mixing and high gloss. |

* Based on results of $^{14}C$/total C according to ASTM D 6866

## Impranil®

Waterborne, anionic/nonionic aliphatic and aromatic polyurethane dispersions for coating textiles, environment-friendly. Suitable for all common textile coating processes in the fields of sports, clothing, fashion articles, technical items, and general protective equipment.

### Impranil® eco

Renewable materials for synthetic leather

- **Example substitution adipic acid by bio-succinic acid** (similar advantage for other selected bio-based raw materials)
- **Bio-based** and significantly **improved carbon footprint** cradle-to-gate in comparison to standard products (internal assessment done, external certification in process)
- Initially **three products** will be offered, that will enable **bio-based PUD** to be used in every layer of the synthetic leather or other coated fabric.
- **Performance matches** existing products and **the bio-based versions** can be dropped in directly **without reformulation.**

| | Impranil® eco DL 519, DLS and DLP-R | Impranil® DL 519, DLS and DLP-R |
|---|---|---|
| Flexibility | ✓ | ✓ |
| Hydrolysis resistance | ✓ | ✓ |
| Abrasion resistance | ✓ | ✓ |
| Processability | ✓ | ✓ |
| Bio-based content | 45-65%* | 0% |

* Value based on theoretical calculation

## Bio-based thermoplastic polyurethane (TPU)

Desmopan®

# Synthopol

SYNTHOPOL THE RESIN COMPANY

## SYNTHALAT A-TH 1561

**Charakteristik:** Polyisocyanatvernetzendes, high-solid, Acrylatharz

**Lieferform:** 65%ig in Butylacetat

**Anwendung:** In Verbindung mit aromatischen und aliphatischen Polyisocyanaten für schnelltrocknende 2K-HS Polyurethanlacke mit hohem Glanz und Fülle, besonders geeignet für die Lackierung von Möbeln. Gehalt an erneuerbaren Rohstoffen ca. 50% auf fest.

**Kenndaten:**

| | |
|---|---|
| Hydroxylzahl (Hausmethode AV-F-H003) | 50-75 |
| Hydroxylgehalt (bezogen auf nfA) | ca. 2,0 % |
| Viskosität in mPas (Lieferform) (Hausmethode AV-F- V005) | 800 - 1600 |
| Vergleichsviskosität in mPas (60%ig in Buac) (Hausmethode AV-F- V005) | 200 - 400 |
| Farbzahl (Gardner) (auf 50% mit Buac verdünnt) (Hausmethode AV-F-F007) | 1 |
| Nichtflüchtiger Anteil (Lieferform) (Hausmethode AV-F-F003) | 65 +/- 1% |
| Flammpunkt in °C (Lieferform) (Hausmethode AV-F-F006) | ca. 27 |
| Dichte in g/ml (Lieferform) (Hausmethode AV-F-D001) | ca. 1,01 – 1,03 |

SYNTHOPOL THE RESIN COMPANY

## SYNTHALAT A-TH 2712

**Characteristik:** Polyisocyanatvernetzendes „high-solid" Acrylatharz

**Lieferform:** 70%ig in Methoxypropylacetat/Shellsol A

**Anwendung:** In Verbindung mit (cyclo-) aliphatischen Polyisocyanaten luft- und ofentrocknende Zweikomponenten Lacke mit hoher Abriebfestigkeit, Chemikalien- und Wetterbeständigkeit für Automobil- und allgemeine Industrielackierung mit schneller Trocknung, guter Haftung und Zähelastizität. VOC bei Decklacken von 450 g/l bei ca. 21 sek erreichbar. Enthält > 40% Anteil an nachwachsenden Rohstoffen im Polymeranteil.

**Kenndaten:**

| | |
|---|---|
| Hydroxylzahl DIN 53240, mg KOH/g nfA | 140 - 160 |
| Hydroxylgehalt bezogen auf nfA | ca. 4,5 % |
| Viskosität mPas/Lff/DIN 53019/23°C | 3000 – 7000 |
| Farbzahl (Hazen) DIN 53995 | < 100 |
| Nichtflüchtiger Anteil Lieferform/DIN 53216/1g Harz/1h/125°C | 70 +/- 1% |
| Flammpunkt DIN EN 456 (Setaflash), in °C | 42 - 48 |
| Dichte (Lffm.) DIN 53217(20°C, g/ml) | 1,02 – 1,05 |

innovation forward

https://www.synthopol.com/suche-nach-produktgruppen/

# Acrylate coatings

innovation forward

# Arkema

SARBIO SERIES

| | Product | Bio-RM origin | % BRC | IKEA compliance |
|---|---|---|---|---|
| Reactive diluents | SARBIO 5100 | Hemicellulose (e.g. corn waste) | 60 | ✗ |
| | SARBIO 5101 | Vegetable oil | 80 | ✓ |
| | SARBIO 5102 | Wood | 75 | ✓ |
| | SARBIO 5105 | Vegetable oil | 80 | ✓ |
| | SARBIO 5106 | Vegetable oil | 85 | ✓ |
| | SARBIO 5108 | Vegetable oil | 85 | ✓ |
| | SARBIO 5201 | Vegetable oil | 60 | ✓ |
| | SARBIO 5300 | Vegetable oil / Animal fat | 14 | ✓ |
| | SARBIO 5301 | Wood | 10 | ✗ |
| | SARBIO 5400 | Wood | 10 | ✗ |
| | SARBIO 5600 | Wood | 15 | ✓ |
| Resin (oligomers) | SARBIO 6100 | Hemicellulose (e.g. corn waste) | 55 | ✗ |
| | SARBIO 6101 | Vegetable oil | 75 | ✓ |
| | SARBIO 6102 | Vegetable oil | 75 | ✓ |
| | SARBIO 6104 | Vegetable oil | 80 | ✓ |
| | SARBIO 6105 | Wood | 70 | ✓ |
| | SARBIO 7101 | Vegetable oil | 70 | ✓ |
| | SARBIO 7102 | Vegetable oil | 10 | ✓ |
| | SARBIO 7103 | Vegetable oil | 10 | ✓ |
| | SARBIO 7201 | Vegetable oil | 45 | tbc |
| | SARBIO 7202 | Vegetable oil | 45 | tbc |

ARKEMA SARTOMER® BIO-BASED

**A new range based on renewable raw materials**

- (Meth)acrylates based oligomers and monomers
- Functionality between 1 and 6
- Determined bio-sourced carbon content comprises to 10-85%

## Example of Sarbio top-coat formulation

**Very low gloss topcoat on pine**

**Resin (Acrylate oligomers)**

- SARBIO 7101 epoxy acrylate 40%
- SARBIO 7201 polyester acrylate 20%

**Reactive diluents (Acryate monomers)**

- SARBIO 5201 Alkyl diacrylate 9%
- SARBIO 5600 Multifunctional acrylate 8%
- SARBIO 5105 Alkyl acrylate 8%

**Additives and PI**

- Matting agent 10%
- Photoinitiators 5%

**Topcoat %BRC = 30%**

→ *Formulation with good adhesion and stain resistance*

innovation forward

https://coatingmaterials.arkema.com/en/technologies/uv-led-eb-curable-resins-additives/acrylate-resins/sarbio/

# Allnex

## UV/EB CURABLE ACRYLATE RESINS

| Product | Functionality | Viscosity cP @ 25 °C | Renewable Raw Material (wt%) 1) | Naturally Derived Carbon (%) 2) | Application | Product Description |
|---|---|---|---|---|---|---|
| EBECRYL® 242 | 2 | 21000 | 30 | 23 | Industrial Coatings | Flexible coating for metal substrates, good adhesion and excellent flexibility. |
| EBECRYL 450 | 6 | 8600 | 30 | 35 | Flexo inks | Polyester acrylate which gives excellent pigment wetting and high reactivity. |
| EBECRYL 452 | 4 | 600 | 24 | 29 | Flexo inks | Polyester acrylate with excellent pigment wetting; enables the production of high concentrated pastes, increasing productivity and process flexibility. |
| EBECRYL 657 | 4 | 125000 | 42 | 52 | Offset inks | Polyester acrylate with good pigment wetting, ink water balance and misting properties. |
| EBECRYL 767 | 1 | 175000 | 30 | 23 | Industrial Coatings | Excellent primer for difficult substrates. |
| EBECRYL 820 | 6 | 550 | 20 | 25 | Flexo inks for indirect food contact packaging | Low migration product; exceptional pigment wetting allows preparation of highly concentrated pigment pastes. |
| EBECRYL 846 | 6 | 45000 | 15 | 17 | High speed Offset inks | Polyester acrylate which gives high reactivity and low misting. |
| EBECRYL 870 | 6 | 48000 | 25 | 30 | Offset inks | Polyester acrylate which gives excellent pigment wetting and high reactivity. Good litho behavior. |
| EBECRYL 1300 | 1 | 10000 | 70 | 54 | Packaging Coatings and Inks | Good adhesion promoting properties. Excellent flexibility, high gloss and light color. |
| EBECRYL 3608 | 2 | 70000 | 7 | 16 | Inks | Fatty acid modified epoxy acrylate recommended for ink formulations where improved pigment wetting is demanded. |
| EBECRYL 3702 | 2 | 900000 | 16 | 16 | Litho Inks | Fatty acid modified epoxy acrylate recommended for ink formulations, good litho behavior and very good pigment wetting. |
| EBECRYL 4491 | 2 | 60000 | 20 | 14 | 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 | 35 | 27 | Industrial Coatings | extremely tough. Low shrinkage during curing, good adhesion to plastic and metal, outdoor resistance. |
| EBECRYL 5848 | 3 | 25000 | 65 | 74 | Litho Inks | Epoxidized Soya Oil Acrylate. BPA-free product. Good for Hot foil stamping. |
| EBECRYL 5850 | 2 | 5000 | 56 | 60 | Litho Inks | High reactivity and high Tg: can be used for BPA-free development in Graphics and Wood Applications. |
| EBECRYL LEO 10801 | 6 | 45000 | 24 | 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. |
| IBOA | 1 | 10 | 65 | 77 | Graphics/Industrial Coatings | Monomer with high diluting power, recommended where flexibility and high Tg need to be combined. |
| OTA 480 | 3 | 90 | 19 | 13 | All | It exhibits low viscosity and good flexibility for a triacrylate and its high functionality contributes to good reactivity and hardness. |
| RAYLOK® 1622 | 3 | 520 | 21 | 23 | Clearcoat for wood | Low viscosity natural oil modified oligomeracrylate. It gives a transparent oil-like natural and warm aspect. |
| Waterborne Products | | | | | | |
| UCECOAT® 7999 | n/a | <200 | 20 | 22 | 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. |
| Only available using mass balance 3 | | | | | | |
| EBECRYL 600 | 2 | 3000 @ 60°C | 23 | 22 | Graphics/Industrial Coatings | Exhibit high reactivity, surface hardness and gloss and the excellent solvent resistance typical of an epoxy resin. |
| EBECRYL 3700 | 2 | 4300 @ 60°C | 23 | 22 | Graphics/Industrial Coatings | Exhibit high reactivity, surface hardness and gloss and the excellent solvent resistance typical of an epoxy resin. |
| EBECRYL 3700/18OT | 2 + 3 | 85000 | 22 | 20 | Graphics/Industrial Coatings | This resin is characterized by its low odor, light color, low irritancy and very fast cure response. |

innovation forward

https://allnex.com/en/info-hub/news/allnex-introduces-a-high-performance,-bio-based-po

# BASF

## BUTYL ACRYLATE

Trade News | September 25, 2023

### BASF broadens its Monomers Portfolio and launches bio-based 2-Octyl Acrylate

- **First commercial scale production of bio-based 2-Octyl Acrylate**
- **$^{14}$C content of 73% according to ISO 16620**
- **High performance and easy to use in a broad range of applications**

Ludwigshafen, Germany – BASF is expanding its growing portfolio of bio-based monomers with a proprietary process for production of 2-Octyl Acrylate (2-OA). The new product underlines BASF's strong commitment to innovation for a sustainable future with 73% $^{14}$C-tracable bio-based content according to ISO 16620. Besides the regular bio-based 2-Octyl Acrylate, BASF also launched the new product as 2-Octyl Acrylate BMB ISCC Plus. Here, the remaining carbon content is ISCC PLUS certified, and by applying BASF's biomass balance (BMB[1]) approach, this variant offers a further reduced product carbon footprint (PCF[2]).

Trade News | August 8, 2024

### BASF switches their portfolio to bio-based Ethyl Acrylate (EA)

- **Bio-based EA has a certified $^{14}$C-traceable content of 40% and offers a Product Carbon Footprint Reduction of 30% compared to fossil-based EA**
- **Readily available drop-in solution for a broad range of applications**
- **Starting Q4 2024, BASF plans to exclusively offer bio-based Ethyl Acrylate going forward**

### 2-Octyl Acrylate (2-OA)

CAS: 42928-85-8

2-Octyl Acrylate is a biobased acrylate monomer with 73% traceable 14C-biobased content according to ISO 16620. With its balanced solvency and a Tg of -47° C, 2-Octyl Acrylate can easily be used as biobased alternative to fossil-based monomers such as, 2-Ethylhexyl Acrylate (2-EHA) and n-Butyl Acrylate (BA), e.g., in adhesives formulations, or coatings applications. The product also offers performance benefits compared to fossil alternatives, showing improved scrub resistance in coatings, shear resistance in adhesives and excellent weatherability. Therefore, 2-Octyl Acrylate is one of the few bio-based monomers which can be used in both standard and high-performance applications. The high purity of BASF's 2-Octyl Acrylate provides a reliably high quality with low non-polymerizable volatile organic content (VOC) and enables customers to use the monomer in a broad application range.

2OA is produced by a patented process involving the reaction of 2-octyl alcohol – as a waste product from castor oil-derived alkyd synthesis (the castor oil itself only grown in areas unsuitable for food crops) – with acrylic acid to form 2-octyl acrylate, with an established biocontent of 73%.

The monomer is inherently hydrophobic in nature compared to (eg n-butyl acrylate (BA)), and therefore would be expected to show advantages in terms of water resistance properties over the oil-based BA monomer. 2OA has a Tg of -44 °C, and therefore it is a potential alternative to either n-butyl acrylate or 2-ethylhexyl acrylate (2-EHA).



https://www.ulprospector.com/knowledge/16446/pe-biobased-polymers-for-sustainable-coatings-and-related-applications-part-1/

https://www.basf.com/global/en/media/news-releases/2023/09/p-23-315

# Cortec

January 13, *2025*

Cortec® is announcing a major step forward in the development of biobased anticorrosion coatings for metal with the release of EcoLine® 3860, Cortec's first water-based acrylic coating to incorporate renewably-sourced resins. EcoLine® 3860 contains 27% USDA certified biobased content and is designed for industrial users who want to increase their use of renewable content. It is an important move toward expanding sustainable options in the specialty field of corrosion inhibiting paints.

EcoLine® 3860 is an extension of Cortec's line of VpCI®-386 anticorrosion coatings, which have become flagship products in the Cortec® portfolio of corrosion solutions. VpCI®-386 represents the journey from solvent-based technologies that once dominated the market to water-based paints that can effectively protect metals from corrosion while reducing VOCs and introducing other user benefits. Over the last several decades, VpCI®-386 has become a mainstay of Cortec® coatings, demonstrating the potential for preservation with reduced environmental impact.

With the release of EcoLine® 3860, Cortec® is poised to follow this pattern in the field of biobased paints for corrosion inhibition. Once again, acrylic paints provide a good starting point for metals protection because of their flexibility, good adhesion, and UV resistance. As typical for Cortec® coatings, EcoLine® 3860 remains well within Green Seal and EPA guidelines for low VOC coatings, registering at 0.6 lbs/gal (72 g/L). Applied clear or matched to a range of custom colors at a DFT (dry film thickness) of 1.5-3.0 mils (38-76 µm), EcoLine® 3860 offers an unobtrusive way to add corrosion protection to metal parts, equipment and structures while introducing renewable content.

As Cortec's first biobased acrylic anticorrosion paint, EcoLine® 3860 represents an important milestone in the use of biobased resins, setting the stage for the development of more advanced biobased anticorrosion coatings in the future. Contact Cortec® to learn more about EcoLine® 3860, and stay tuned for future biobased coatings developments from Cortec® R&D.

CORTEC CORPORATION
Environmentally Safe VpCI®/MCI® Technologies

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 27%

## EcoLine® 3860

### DESCRIPTION

EcoLine® 3860 is a fast-drying, water-based acrylic topcoat designed for direct-to-metal (DTM) applications. It provides excellent adhesion to various metal substrates and forms a durable barrier in outdoor, unsheltered environments. EcoLine® 3860 provides multi-metal protection and superior UV resistance. Made with renewable resin technology, EcoLine® 3860 contains 27% USDA certified biobased content.

It is an ideal solution for industries seeking a high-performance coatings solution with a reduced environmental impact. It can be matched to most custom colors.

### CHARACTERISTICS/TECHNICAL DATA

| | |
|---|---|
| Volume Solids | 46% |
| Gloss (ASTM D523/ISO 2813) | 85+ GU/60° |
| VOCs (ASTM D3960) | 0.6 lbs/gal (72 g/L) |
| Viscosity | 7,000-12,000 CPS |
| Pencil Hardness (ASTM D3363/ISO 15184) | HB* |
| Spreading Rate | 660.7 ft²/gal @ 1 mil DFT (16.2 m²/L @ 30 µm) |
| Density (ISO 758) | 1.03 @ 69°F (20°C) |
| Density | 8.6 lbs/gal |
| Flash Point | Does not flash |
| Recommended DFT | 1.5-3.0 mils (38-76 µm) |
| Recommended WFT | 2.4-7.4 mils (61-188 µm) |
| Dry to Touch | 40 min |
| Dry to Handle | 1 hr |
| Recoat Time | 1 hr |
| Force Dry | 15-20 min @ 150°F (65°C) |
| Full Cure | 3-7 days |
| Salt Spray (ASTM B117/ISO 9227) | 168 hrs* |
| Humidity (ASTM 1735/ISO 6270-1) | 1008 hrs* |
| Adhesion (ASTM D3359/ISO 2409) | 0/5B |

*Test performed with a 2 mil DFT after a 7-day cure at ambient temperature with passing criteria:
- Salt fog: mean creep from scribe ≤2.0 mm & max creep from scribe ≤5.0 mm (ASTM D1654).
- Salt fog & Humidity: blister rating ≤few (ASTM D714), surface rust rating ≥9 (ASTM D610).



https://www.cortecvci.com/product-release-cortec-steps-into-the-future-with-biobased-acrylic-anticorrosion-coating/

# Lubrizol

**PERFORMANCE COATINGS** **PRODUCT DATA SHEET**

## Carboset® 3076

Aqueous Thermosetting Resin

Carboset® 3076 is a carboxylated acrylic dispersion polymer based primarily on renewable resources. This thermosetting resin provides outstanding tensile properties and good solvent resistance with no formaldehyde emissions during the cure cycle. This material will provide excellent rigidity as a binder for wet laid fiberglass, construction products and insulation applications.

### FEATURES AND BENEFITS

- Contains Bio-Based Content
- Corrosion Resistance
- Heat Reactive
- Renewable
- Solvent Resistance
- Toughness

### CHARACTERISTICS

| Characteristic Name | Value |
|---|---|
| % Weight Solids | 43.5-46.5 |
| Appearance | Straw to amber colored liquid |
| Brookfield Viscosity (cps) | 175-750 |
| Freeze/Thaw Stability | stable |
| pH Value | 2.00-3.00 |

### REGULATORY

- Formaldehyde-Free[1]

[1]Not intentionally added to the composition of this product

### APPLICATIONS

- Fiberglass Media
- Filtration Media
- General Paper & Nonwovens

TECHNICAL DATA SHEET

## Carboset®3076

Aqueous Thermosetting Resin

Lubrizol

PERFORMANCE COATINGS

### PRODUCT DESCRIPTION

Carboset® 3076 is a carboxylated acrylic solution polymer based primarily on renewable resources. This thermosetting resin provides outstanding tensile properties and good solvent resistance with no formaldehyde emissions during the cure cycle. This material will provide excellent rigidity as a binder for wet laid fiberglass, constructions products, and insulation applications.

### FEATURES/BENEFITS

- Formaldehyde free
- High level of renewability
  Renewable content~85%
- Heat reactive thermoset polymer
- Surfactant free
- Excellent shear stability
- Excellent Strength properties
  Tensile (dry, hot dry ,hot wet)
- Excellent Solvent resistance
  Plasticizer tensile
- Reduced corrosion of metal vs. commercial acid derived thermosets

### PHYSICAL CHARACTERISTICS*

| | |
|---|---|
| Appearance | straw to amber colored liquid |
| Solids, weight% | 45.0-48.0 |
| Viscosity | 175-750 |
| (# 3 spindle 60 rpm @ 25°C) | |
| pH | 3.0-3.8 |
| Freeze-thaw stability | stable |

*Typical physical properties not to be taken as specifications

innovation forward

https://media.lubrizol.com/-/media/project/lubrizol-corporation/lubrizol/master-site/coatings/pds/pds_cst3076_co_en.pdf?isClicked=true

https://www.lubrizol.com/solutions/products/carboset

# Covestro

## DECOVERY SERIES

Decovery® is a family of plant-based resins designed to deliver high-performance products across coatings and inks markets while treating our planet gently. It's made from plant-based materials that are sustainably sourced. The Decovery® portfolio includes products with as much as 52% plant-based content – as verified by the 14C standard for complete transparency.

We want a world where high-performance coatings and inks have zero impact on the health of people and the environment. With the Decovery® solution we have made it our mission to accelerate the transformation towards plant-based coatings and inks.

Do you want a coating or ink that delivers outstanding performance while safeguarding the health of both people and planet? Decovery® is a family of partially bio-based resins designed to deliver high-performance products across the coatings and inks industries while treating our planet gently. It's made from materials that are more sustainably sourced. The Decovery® portfolio includes products with up to 52% plant-based content – as verified by carbon-14 analysis

Containing up to 52% bio-based content, our eco-friendly **Decovery®** resins deliver outstanding performance in interior and exterior wall and floor coatings, while safeguarding the health of both people and planet. With low minimum film-forming temperatures, they offer a range of key benefits. These include the self-matting properties of **Decovery® SP-2022**, which eliminates the need for matting agents, the fast drying and alkaline resistance of **Decovery® SP-7450**, the water resistance and broad adhesion of **Decovery® SP-8310 XP**, the scrub resistance of **Decovery® SP-8406 XP** – and much more.

| Product name | Description | Benefits | Solids (%) | MFFT (°C) | Biobased % / C14 | Application |
|---|---|---|---|---|---|---|
| **Decovery® SP-2022** | Self-crosslinking inherently matt aliphatic urethane. | Matt appearance, neutral wood coloration, excellent chemical, black heel and scuff resistance, non polishing. | 34 - 36 | <5 | 35% | Wood and seamless flooring, decorative coatings. |
| **Decovery® SP-7450** | Acrylic copolymer. | Fast drying, fast blocking resistance, good alkaline resistance. | 44 | 10 | 39% | Exterior wood. |
| **Decovery® SP-8310 XP** | Pure acrylic. | Excellent water resistance, broad adhesion profile, good blocking. | 47 | 5 | 37% | Interior & exterior coatings including façade and trim. |
| **Decovery® SP-8406 XP** | Pure acrylic. | Good scrubs resistance. | 47 | 0 | 52% | Interior & exterior wall paints. |
| **Decovery® SP-8030** | Amine free fatty acid modified aliphatic based polyurethane dispersion. | Drying speed, low odor, transparency, film hardness, scratch resistance, water resistance. | 42 | - | 43% | Decorative interior & exterior stains and paints for wood and metal. |

# Covestro

## UV CURABLE ACRYLICS WITH BIOBASED CONTENT

**Our partly bio-based, 100%-solids UV resin portfolio**

We currently offer 15 partly bio-based UV resins containing up to 83% bio-based content. These resins come from three of our brands:

**AgiSyn™**
100%-solids materials designed for high-throughput coating and printing lines

**NeoRad™**
Including 100%-solids materials for high-throughput production lines

**NeoCryl®**
Including 100%-solids acrylic resins for high-throughput production lines

The resins in this portfolio offer high-performance properties including multi-substrate adhesion, pigment grinding, silky-feel haptics, excellent wetting, and easy gloss reduction. They're particularly suitable for interior furniture and flooring applications, as well as printing & packaging purposes.

**Toward even more sustainable, high-performance UV resins**

As we expand this portfolio, we'll strive to offer even higher levels of both bio-based content and functional performance. Alongside this, we'll continue exploring other ways to improve the sustainability of our resins, such as alternative fuels, recycled raw materials, and mass balancing.

To do this, your feedback is essential. As such, we'd like to have ongoing discussions about how we can tailor these resins to your specific application needs. This could look like increasing mechanical and chemical resistance in furniture applications, for example, or prioritizing recyclability for printing & packaging applications. Together, we can enable the even more sustainable, effective UV-curable coatings of tomorrow.

## UV resins made with bio-based content

**Across the coatings industry, demand is growing for more sustainable solutions that can lower your customers' environmental impact. UV-curable coatings are an established way to achieve this, since they need less energy to cure. And using partly bio-based resins can make your UV-curable coatings even more sustainable.**

### Key benefits

**of partly bio-based UV resins from Covestro**

- Certified bio-based C14 content (up to 83%)
- Lower carbon footprint
- High-performance properties
- Good cost value

## Our partly bio-based,100%-solids UV resin portfolio

| Resin | Bio-based C14 content | Application | Features |
|---|---|---|---|
| **AgiSyn™ 248** | 45% | Overprint varnishes | Silky-feel urethane acrylate used in combination with easy gloss-reduction technology to obtain haptic matt overprint varnishes (OPV) |
| **AgiSyn™ 701** | 13% | All-purpose | All-purpose amine-modified acrylate; cure-speed booster with good pigment wetting |
| **AgiSyn™ 705** | 56% | Offset inks | Fatty-acid-modified polyester acrylate with excellent pigment-grinding vehicle for offset inks |
| **AgiSyn™ 717** | 44% | Flexo inks | Low-extractable fatty-acid-modified polyester acrylate used as pigment-grinding vehicle for flexo, screen, and offset inks offering good adhesion |
| **AgiSyn™ 720** | 15% | Coatings and inks | Low-viscosity polyester acrylate with good diluting power |
| **AgiSyn™ 2020** | 83% | Coatings and inks | Epoxidized soya oil acrylate with excellent wetting properties suitable for inks and coatings |
| **AgiSyn™ 2837** | 14% | All-purpose | General-purpose diluent (GPTA) with a good balance between flexibility and hardness<br>*Also available as High Purity version (P grade) for low migration applications* |
| **AgiSyn™ 2870** | 79% | All-purpose | Monomer (IBOA) with high Tg and strong diluting power |
| **AgiSyn™ 2896** | 80% | All-purpose | Monomer (LA) with low Tg and strong diluting power |
| **NeoCryl® B-302** | 32% | Coatings and inks | Inert acrylic polymer that reduces shrink and stress in UV-cured systems. Highly suitable for adhesion primers |
| **NeoRad™ E-20** | 12% | Offset inks | Fatty-acid-modified bisphenol A epoxy acrylate with good lithographic behavior and pigment wetting, recommended for use in offset inks |
| **NeoRad™ CQ P-12** | 52% | Coatings | Polyester acrylate ideal for basecoats, sealers, and wear-layer uses that demand flexibility, wear resistance, and/or pigment wetting |
| **NeoRad™ P-50** | 13% | Coatings and inks | LED-curing polyester acrylate exhibiting Newtonian flow behavior of pigment concentrates |
| **NeoRad™ U-81** | 26% | Coatings and adhesives | Elastic aliphatic urethane acrylate (>300% elongation) for primer applications on melamine paper or in adhesives |
| **NeoRad™ U-6282** | 38% | Coatings | Easy-to-matt (when formulated with conventional matting agents) urethane acrylate, for topcoat use in flooring and furniture applications |

# Evonik

BIOBASED METHACRYLATE

## Methacrylate Monomers with a Reduced Carbon Footprint



### VISIOMER® Terra Family

**Segregated Bio-Based and Low Hazard**
VISIOMER® Terra offers sustainable and low hazardous building blocks for your polymers with a biocarbon content of up to 85%. Life-cycle analysis data are available for all our VISIOMER® Terra products, demonstrating the carbon footprint reduction throughout the entire value chain. What's more, we guarantee the bio contents of our VISIOMER® Terra products under the Certification Scheme Biobased Products according to ASTM D 6866.



### VISIOMER® eCO Family

**Reduced Carbon Footprint**
In addition to our VISIOMER® Terra product line, our new VISIOMER® eCO products are based on mass-balanced raw materials from readily available feedstocks. They have a significantly lower carbon footprint than fossil-based equivalents.

**Our VISIOMER® eCO Product Portfolio**

| Mass Balanced Equivalent of VISIOMER® EHMA with Reduced Carbon Footprint | Benefits |
|---|---|
| VISIOMER® eCO EHMA | Mass balanced equivalent of VISIOMER® EHMA with reduced carbon footprint. Hydrophobic monomer. |

| Bio-Based Terra Equivalents Existing VISIOMER® Products | Bio Content (%) | Benefits |
|---|---|---|
| VISIOMER® Terra PEG 200 DMA | 50 | Bio-based equivalent of VISIOMER® PEG 200 DMA with reduced carbon footprint. Hydrophilic crosslinker. |

| New Structures \| VISIOMER® Terra Products | Bio Content (%) | Benefits |
|---|---|---|
| VISIOMER® Terra CARMA | 84 | Provides oxidative secondary crosslinking and improves water resistance. |
| VISIOMER® Terra IPGMA | 30 | Reactive diluent with low odor and low vapor pressure, e.g. acrylic adhesive. |
| VISIOMER® Terra ISDMA | 43 | Rigid, with low shrinkage, e.g. for core-shell emulsions. |

innovation forward

https://www.evonik.com/en/company/businesslines/oa/specialty-methacrylates/sustainability/visiomer-terra.html

# Alberdingk Boley

BIOBASED ACRYLIC DISPERSIONS



## Sustainable through biobased products.

Dedicated teams from our R&D and Technical Marketing consistently work on improving the sustainability performance of our products without our clients needing to compromise on quality and performance. Biobased products are part of our heritage; vegetable oils like linseed and castor oil are naturally biobased and have been used by Alberdingk Boley as renewable plant-based binders from the beginning. Since the 1970s we have been producing sustainable water-based dispersions and from the 1990s onwards we have been developing polyurethane dispersions based on castor oil. As a result of extensive research we introduced polyurethane dispersions based on linseed oil in 2005. That same year we also started manufacturing our new ALBODUR® range of polyols based on castor oil, with a solids content of 100% for high demanding 2pack coatings. At present we are working on acrylic dispersions based on renewable raw materials and thus consistently follow our path towards a wider range of biobased products.

## Water-based dispersions – environmentally friendly by nature!

Water rather than organic solvents: Our outstanding know-how in the polymerisation of solvent-free acrylic and polyurethane dispersions makes us a leading partner of industry throughout the world. Our waterborne binders contribute fundamentally to improving the properties of your products. Every substrate places special demands on the coating: ALBERDINGK® water-borne dispersions ensure that all these requirements can be met.
Filter by properties and applications and find the right product.

ALBERDINGK BOLEY

| Name | Renewable content on solids | Minimum film forming temperature (MFFT) | Solids content | Viscosity (Brookfield RVT) (mPas) | pH-value |
|---|---|---|---|---|---|
| **ALBERDINGK® Ren AC 5605 VP** Acrylics | 21 | 5 | 49.0 - 51.0 | 20 - 2,000 | 8.0 - 9.0 |
| **ALBERDINGK® Ren AC 8003 VP** Acrylics | 45 | 3 | 49.0 - 51.0 | 20 - 2,000 | 7.0 - 9.0 |
| **ALBERDINGK® Ren AC 8025 VP** Acrylics | 38 | 0 | 48.0 - 50.0 | 500 - 5,000 | 7.5 - 8.5 |
| **ALBERDINGK® Ren AC 8403 VP** Acrylics | 32 | 20 | 46.0 - 48.0 | 200 - 2,000 | 8.0 - 9.0 |
| **ALBERDINGK® Ren AC 8700 VP** Acrylics | 42 | 4 | 42.0 - 44.0 | 100 - 2,000 | 7.0 - 8.0 |
| **ALBERDINGK® Ren AC 9630 VP** Acrylics | 21 | 25 | 40.0 - 42.0 | 50 - 500 | 7.0 - 8.5 |
| **ALBERDINGK® Ren AS 7900 VP** Styrene-acrylics | 40 | 0 | 48.0 - 50.0 | 20 - 2,000 | 7.0 - 8.0 |

innovation forward

https://www.alberdingk-boley.de/en/Products/Biobased/

# Cortec

## Cortec® Steps Into the Future with Biobased Acrylic Anticorrosion Coating

January 13, *2025*

Cortec® is announcing a major step forward in the development of biobased anticorrosion coatings for metal with the release of EcoLine® 3860, Cortec's first water-based acrylic coating to incorporate renewably-sourced resins. EcoLine® 3860 contains 27% USDA certified biobased content and is designed for industrial users who want to increase their use of renewable content. It is an important move toward expanding sustainable options in the specialty field of corrosion inhibiting paints.

## EcoLine® 3860

### DESCRIPTION

EcoLine® 3860 is a fast-drying, water-based acrylic topcoat designed for direct-to-metal (DTM) applications. It provides excellent adhesion to various metal substrates and forms a durable barrier in outdoor, unsheltered environments. EcoLine® 3860 provides multi-metal protection and superior UV resistance. Made with renewable resin technology, EcoLine® 3860 contains 27% USDA certified biobased content.

It is an ideal solution for industries seeking a high-performance coatings solution with a reduced environmental impact. It can be matched to most custom colors.

### CHARACTERISTICS/TECHNICAL DATA

| | |
|---|---|
| Volume Solids | 46% |
| Gloss (ASTM D523/ISO 2813) | 85+ GU/60° |
| VOCs (ASTM D3960) | 0.6 lbs/gal (72 g/L) |
| Viscosity | 7,000-12,000 CPS |
| Pencil Hardness (ASTM D3363/ISO 15184) | HB* |
| Spreading Rate | 660.7 ft²/gal @ 1 mil DFT (16.2 m²/L @ 30 µm) |
| Density (ISO 758) | 1.03 @ 69°F (20°C) |
| Density | 8.6 lbs/gal |
| Flash Point | Does not flash |
| Recommended DFT | 1.5-3.0 mils (38-76 µm) |
| Recommended WFT | 2.4-7.4 mils (61-188 µm) |
| Dry to Touch | 40 min |
| Dry to Handle | 1 hr |
| Recoat Time | 1 hr |
| Force Dry | 15-20 min @ 150°F (65°C) |
| Full Cure | 3-7 days |
| Salt Spray (ASTM B117/ISO 9227) | 168 hrs* |
| Humidity (ASTM 1735/ISO 6270-1) | 1008 hrs* |
| Adhesion (ASTM D3359/ISO 2409) | 0/5B |

*Test performed with a 2 mil DFT after a 7-day cure at ambient temperature with passing criteria:
- Salt fog: mean creep from scribe ≤2.0 mm & max creep from scribe ≤5.0 mm (ASTM D1654).
- Salt fog & Humidity: blister rating ≤few (ASTM D714), surface rust rating ≥9 (ASTM D610).

innovation forward

https://www.cortecvci.com/product-release-cortec-steps-into-the-future-with-biobased-acrylic-anticorrosion-coating/

# Synthos

BIOBASED ACRYLIC DISPERSIONS

## SYNBIOXIL® - bio-based dispersions

In response to global environmental challenges, Synthos is consistently implementing its Sustainable Development Strategy, which aims to produce only fully sustainable products by 2030. One of the key steps in this direction is the development of innovative technologies based on bio-based raw materials.

Our SYNBIOXIL® dispersions are an innovative product line that combines high quality with environmental concerns. They contain up to 30% bio-based raw materials (actual carbon content according to ASTM D6866-20, Method B) and offer performance comparable to traditional fossil fuel based dispersions. This allows our customers to develop more sustainable formulations without compromising on performance.

SYNBIOXIL® also means no environmental hazards – our dispersions are free of APEOs, solvents, harmful plasticisers and other substances on the SVHC list (Substances of Very High Concern, according to the REACH regulation). They also have a low VOC/SVOC content and are free of formaldehyde.

We can also offer our bio-based dispersions in accordance with the ISCC+ standard and the mass balance approach.



| | | Synbioxil® XP 2030 | Synbioxil® XP 0530 |
|---|---|---|---|
| | Application | indoor, outdoor, acrylic, silicon, low VOC: interior and exterior decorative and protective coatings, acrylic and silicone plasters | indoor, outdoor, low VOC: interior and exterior decorative coatings |
| | Bio-based content (ASTM D6866-20 B method) | ca. 30% | |
| | Polymer type | acrylic copolymer | |
| Specification | pH | 7,5 ÷ 8,5 | 7,4 ÷ 8,0 |
| Specification | Solids content (%) | 50 ± 1 | 47 ± 2 |
| Specification | Brookfield viscosity (mPa•s) | 500 ÷ 2 000 | < 2 000 |
| Parameters | MFFT (°C) | ca. 20 | < 5 |
| Parameters | Tg (°C) | ca. 25 | ca. 5 |
| Parameters | Mean particle size (nm) | 90 ÷ 110 | 90 ÷ 110 |

| | | |
|---|---|---|
| | Application | transparent and pigmented wood lacquers |
| | Bio-based content (ASTM D6866-20 B method) | ca. 20% |
| | Polymer type | acrylic copolymer |
| Specification | pH | 8,3 - 8,7 |
| Specification | Solids content (%) | 40 ± 1 |
| Specification | Brookfield viscosity (mPa•s) | < 1000 |
| Parameters | MFFT (°C) | < 40 |
| Parameters | Mean particle size (nm) | 70 ÷ 100 |

innovation forward

https://www.synthosgroup.com/en/synbioxil-2/

# Sinocure

## Sinomer® UVP4398B

**Bio-based polyester acrylate, 28% bio-content, trifunctional acrylate, flexible UV resin**

SINOMER® UVP4398B is a 28% bio-based aliphatic polyester acrylate manufactured for flexible UV inks and wood coatings. This trifunctional oligomer offers excellent flexibility and fast cure speed for sustainable formulations.

| | |
|---|---|
| Product description: : | Bio-based Aliphatic Polyester Acrylate |
| Viscosity (Cps/25°C) : | 10,000 - 13,000 |
| Functionality : | 3 |
| Color (fe/co) : | ≤100 |
| Acid value(mg KOH/g) : | ≤15 |
| Package : | 20,200kg/drum |

## Sinomer® UVP4399B

**Bio-based polyester acrylate, sustainable UV oligomer, 65% bio-content, trifunctional acrylate**

SINOMER® UVP4399B is a 65% bio-based aliphatic polyester acrylate manufactured for sustainable UV inks and wood coatings. This trifunctional oligomer offers high flexibility and fast cure speed for eco-friendly formulations.

| | |
|---|---|
| Product description: : | Bio-based Aliphatic Polyester Acrylate |
| Viscosity (Cps/25°C) : | 20,000 - 30,000 |
| Functionality : | 3 |
| Color (fe/co) : | ≤60 |
| Acid value(mg KOH/g) : | ≤15 |
| Package : | 20,200kg/drum |

## Sinomer® UVE3104B

**Halogen-free epoxy acrylate, bio-based UV oligomer, UV paper varnish, soybean oil acrylate**

SINOMER® UVE3104B is a truly halogen-free, bio-based epoxy acrylate manufactured for UV paper varnishes and wood coatings. It provides excellent wetting and leveling properties while meeting stringent environmental requirements.

| | |
|---|---|
| Product description: : | Halogen-Free Epoxidized Soybean Oil Acrylate |
| Viscosity (Cps/25°C) : | 20,000 - 35,000 |
| Functionality : | 3-4 |
| Color (fe/co) : | ≤13 |
| Acid value(mg KOH/g) : | ≤9.5 |
| Package : | 200kg/drum |

## Sinomer® ISDA

**isosorbide diacrylate, bio-based monomer, low irritation acrylate, high hardness UV resin**

SINOMER® ISDA is a bio-based difunctional acrylate monomer manufactured for UV-curable coatings and inks,we provide this renewable-sourced monomer offering high hardness, fast curing, and reduced skin irritation compared to conventional acrylates.

| | |
|---|---|
| Chemical name : | isosorbide diacrylate |
| CAS No. : | n/a |
| MF : | $C_{12}H_{14}O_6$ |
| Package : | 25kg,200kgs/drum. |

## Sinomer® LA

**Lauryl acrylate, CAS 2156-97-0, bio-based monomer, UV reactive diluent**

SINOMER®LA is an Bio-Based acrylate monomer suitable for photocuring reactions,with good flexibility,

| | |
|---|---|
| Chemical name: | Lauryl acrylate / Dodecyl acrylate |
| CAS No. : | 2156-97-0 |
| MF : | C15H28O2 |
| Package : | 200kgs/drum |
| Assay : | 98% min |

## Sinomer® UVU6215B

**Bio-based urethane acrylate, aliphatic UV oligomer, flexible UV resin**

SINOMER® UVU 6215B is a bio-based aliphatic urethane acrylate oligomer manufactured for EB/UV curable coatings. It provides excellent flexibility, high elongation at break and fast curing speed for plastic and wood substrates.

| | |
|---|---|
| Product description: : | bio-based aliphatic urethane acrylate |
| Viscosity (Cps/60°C) : | 10,000 - 20,000/60°C |
| Functionality : | 2 |
| Color (fe/co) : | ≤60 |
| Acid value(mg KOH/g) : | ≤15 |
| Package : | 20,200kg/drum |

## Sinomer® UVU6214B

**Difunctional urethane acrylate, flexible UV resin, low shrinkage oligomer, screen ink resin**

SINOMER® UVU 6214B is a bio-based modified difunctional polyurethane resin with excellent yellowing resistance, fast surface drying, good flexibility, strong adhesion, and low shrinkage.

| | |
|---|---|
| Product description: : | Bio-based modified difunctional polyurethane |
| Viscosity (Cps/25°C) : | 40,000 - 50,000 |
| Functionality : | 2 |
| Color (fe/co) : | ≤8 |
| Acid value(mg KOH/g) : | ≤13 |
| Package : | 20,200kg/drum |

## Sinomer® UVE3103B

**Epoxidized soybean oil acrylate, bio-based epoxy acrylate, sustainable UV oligomer, CAS 91722-14-4**

SINOMER UVE3103B is a Soybean oil epoxy acrylate, used in multiple applications due to its improved chemical properties,

| | |
|---|---|
| Product description: : | Soybean oil epoxy acrylate |
| Viscosity (Cps/25°C) : | 10000-30000 |
| Functionality : | 3-4 |
| Color (fe/co) : | ≤8 |
| Acid value(mg KOH/g) : | ≤12 |
| Package : | 200kg/drum |

## Sinomer® IBOMA-Isobornyl Methacrylate

**Bio-based monomer,Monofunctional Monomer**

Sinomer® IBOMA is suitable for manufacturing high Tg thermoplastic acrylic resin.

| | |
|---|---|
| Chemical name : | Isobornyl methacrylate |
| CAS No. : | 7534-94-3 |
| MF : | C14H22O2 |
| Package : | 25 or 200 kg/ drum |
| Assay : | 99%min |

## Sinomer® IBOA-Isobornyl acrylate

**Isobornyl acrylate, CAS 5888-33-5, bio-based monomer, UV reactive diluent**

Sinomer® IBOA/IBXA Monomer is a Bio-based monomer with relatively high reactivity, weather resistance。

| | |
|---|---|
| Chemical name : | Isobornyl acrylate |
| CAS No. : | 5888-33-5 |
| MF : | C13H20O2 |
| Package : | 25 or 200 kg/ drum |
| Assay : | 98%min |

innovation forward

https://www.sinocurechem.com/product/bio-based-acrylic-monomers.html

# Organik Kimya

ORGANİK KİMYA

## ORGAL® RW Coating Binders

Orgal® RW coating binders product portfolio offers biobased and recycled water based binders for a variety of applications. Biobased product portfolio contains C14 biobased building blocks according to the ASTM D6866 Standard. Orgal® RW containing recycled monomer is in line with international 'better' carbon standards and follows ISO 14025. It contributes to circular economy by using materials at the end of their life cycle and enabling their re-evaluation in the system.

**ORGAL® RW B2620** is a formaldehyde- and APEO-free biobased acrylic polymer designed for high-performance architectural coatings.

| | Chemical Composition | Solid Content (±1%) | Sustainable Content % | Content Type | Carbon Footprint Saved per kg (%) (compared to std OK product) | pH | Viscosity (mPa) (max) | MFFT (°C) | $T_g$ (°C) | Applications |
|---|---|---|---|---|---|---|---|---|---|---|
| Orgal® RW R4630 | AC | 40 | 44 | Recycled | 46.8 | 8.0 – 9.0 | 1000 | 20 ± 2 | n/a | Interior industrial wood coatings and interior trim paints |
| Orgal® RW R838W | AC | 46 | 50 | Recycled | 53.7 | 7.5 – 8.5 | 500 | 14 ± 1 | 22 ± 1 | Exterior and interior applications, wood coatings, and wood stains |
| Orgal® RW R650 | AC | 50 | 35 | Recycled | 39.3 | 8.0 – 8.5 | 1200 | <3 | -1 | Stain-blocking primers for wood, walls, ceilings and metal surfaces |
| Orgal® RW R839W | AC | 46 | 51 | Recycled | 57.8 | 7.5 – 8.5 | 500 | 17 ± 1 | n/a | Exterior and interior applications, wood coatings, and wood stains. |
| Orgal® RW RM838W | AC | 46 | 97.5 | Recycled & Mass Balance | 88 | 7.5 - 8.5 | 500 | 14 ± 1 | 22 ± 1 | Exterior and interior applications, wood coatings, and wood stains |
| Orgal® RW B650 | AC | 50 | 43 | Biobased | 61.9 | 8.0 – 8.5 | 1200 | <3 | -1 | High quality stain-blocking primers for wood, walls, ceilings and metal surfaces |

innovation forward

https://www.organikkimya.com/upload/bu_catalogues/Orgal_RW_Renewable_Coating_Binders.pdf

# Alkyd coatings

innovation forward

# Allnex

## BIOBASED ALKYD RESINS

| Product | Application | % Bio-based on resin solids | % Bio-based on delivery form | Performance characteristics |
|---|---|---|---|---|
| Water borne Alkyd Resins | | | | |
| RESYDROL® AF 502w/35WA | Monocoat, topcoat stoving | 45% - 55% | 45% - 55% | High body, no organic co-solvent, pigment wetting. |
| RESYDROL AM 420w/66BPWA | Primer, topcoat, monocoat stoving | 30% - 35% | 30% - 35% | Adhesion, balanced hardness and flexibilty, corrosion resistance. |
| RESYDROL AX 237w/70BG | Primer, Air drying | 25% - 30% | 25% - 30% | Humidity and Corrosion resistance. High gloss.Easy application. |
| RESYDROL AX 246w/70BG | Primer stoving | 15% - 20% | 10% - 15% | Dipping paints. Combined with CYMEL® 303 LF - offers corrosion resistance. |
| RESYDROL AX 247w/70BGMP | Stoving coatings | 15% - 20% | 15% - 20% | Electrical insulation paints. |
| RESYDROL AX 250w/75EP | Primer stoving | 15% - 20% | 15% - 20% | Dipping paints. Combined with CYMEL 303 LF - offers corrosion resistance. |
| RESYDROL AY 466w/38WA | Topcoat, air drying | 40% - 45% | 40% - 45% | Humidity resistance. High gloss. Fast drying. |
| RESYDROL AY 586w/45WA | Wood external stain | 55% - 65% | 55% - 65% | Adhesion and penetration on wood, open time and durability. |
| RESYDROL AY 6150w/45WA | Primer, topcoat, monocoat, air drying | 30% - 40% | 30% - 40% | Humidity and corrosion resistance. High gloss. Easy application. |
| RESYDROL AY 6705w/44WA | Wood external stain | 35% - 40% | 35% - 40% | Durability, fast drying, suitable for vertical and horizontal wood applications. |
| RESYDROL AZ 6191w/42WA | Metal , wood internal & external trim | 40% - 45% | 40% - 45% | Suitable for wood and metal applciations, gloss, flow, leveling and chemical resistance, durability. |
| RESYDROL AZ 6710w/41WA | Wood external stain | 30% - 35% | 30% - 35% | Very hard, quick drying grade for wood applications, mostly used as a blending resin. |
| RESYDROL AZ 6711w/40WA | Wood external stain | 40% - 50% | 40% - 50% | Very hard, quick drying grade for wood applications, mostly used as a blending resin. |
| RESYDROL VAF 6111w/60WA | Interior wall paint | 35% - 45% | 35% - 45% | Blending partner for acrylic applications to improve adhesion and applicability with low yellowing. |
| RESYDROL VAL 5547w | Wood impregnation | 70% - 80% | 70% - 80% | Penetration on wood, low grain rising and oil feeling application. |
| RESYDROL VAY 6096w/39WA | Topcoat, air drying | 25% - 35% | 25% - 35% | Humidity resistance. Fast drying. |
| SETAQUA® 6006 | Industrial wood, primer, topcoat, air drying | 45% - 55% | 45% - 55% | Fast drying, wood penetration and corrosion resistance. |
| SETAQUA 6004 YA | Industrial wood, primer, topcoat, air drying | 70% - 80% | 70% - 80% | Fast drying, wood penetration, Water borne and yellowing resistance. |



https://allnex.com/getmedia/f7f51d17-bb2c-47fd-9527-6da07e2b2deb/0141_ALRenewables_web.pdf

# Allnex

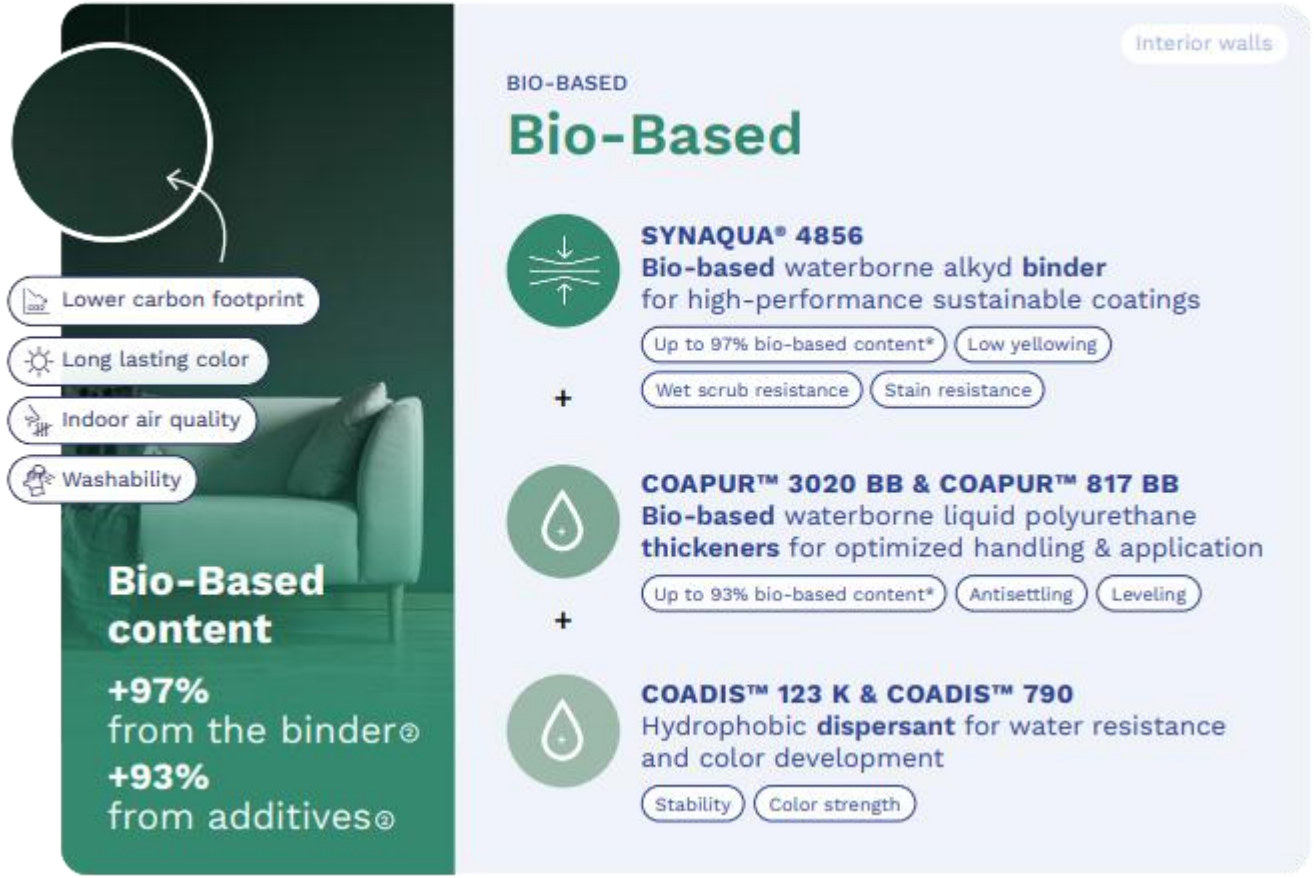
## BIOBASED ALKYD RESINS

| Product | Application | % Bio-based on resin solids | % Bio-based on delivery form | Performance caracteristics |
|---|---|---|---|---|
| **Solvent borne alkyd resins** | | | | |
| SETAL® 62 EHV SM-60 | Primer, monocoats, air drying | 65% - 70% | 35% - 45% | Fast drying, hardness. |
| SETAL 84 XX-70 | Primer, stoving | 10% - 15% | 5% - 15% | Appearance, durability. |
| SETAL 118 XX-60 | Wood acid cure, primer, stoving | 60% - 65% | 35% - 40% | Hardness, adhesion, imapact resistance, durability, gloss retention. |
| SETAL 1257 SM-69 | Wood external trim | 60% - 70% | 40% - 45% | Durability and drying, little yellowing. |
| SETAL 142 XX-60 | Primer, air drying | 30% - 35% | 15% - 25% | Drying, yellowing resistance, adhesion. |
| SETAL 1601 WS-65 | Deco topcoats | 40% - 50% | 25% - 35% | Outdoor durability, fast drying. |
| SETAL 196 XX-65 | Top coat, airdrying, stoving | 45% - 55% | 30% - 35% | Fast drying, low yellowing, gloss, gloss retention. |
| SETAL 270 SM-70 | Wood external trim | 60% - 70% | 40% - 50% | Color retention, brushability, body and flow, durability. |
| SETAL 293 | Wood external trim | 80% - 90% | 80% - 90% | Brushability, leveling, filling, high gloss, suitable as reactive diluent . |
| SETAL 304 | Wood external trim | 75% - 85% | 75% - 85% | Drying, durability and pigment dispersion properties. |
| SETAL 305 SM-90 | Wood external trim | 75% - 80% | 65% - 75% | Drying, durability and pigment dispersion properties. |
| SETAL 301 SM-83 | Wood external trim | 65% - 70% | 55% - 60% | Durability and drying, minimal yellowing. |
| SETAL 312 SM-88 | Wood external trim | 75% - 85% | 65% - 75% | Outdoor durability and low yellowing. Large amount of renewable raw materials. |
| SETAL 321 SM-75 | Wood external trim | 70% - 75% | 45% - 55% | Additive resin to increase solid contentand improve chemical and abrasion resistance. drying and hardness. |
| SETAL 707 BA-75 | Wood acid cure | 50% - 55% | 35% - 45% | For high-solid acid curing and nitrocellulose systems. |
| SETAL A F 48 TB/X | Primer, monocoat, topcoat, air drying | 45% - 55% | 25% - 30% | Broad application, special effect finishes. |
| SETAL A F 300 SN | Topcoat, stoving | 15% - 25% | 5% - 15% | Mechanical properties, resistant to acid and waxes. |
| SETAL A F 310 SN | Topcoat, stoving | 15% - 25% | 10% - 15% | Reactivity, yellowing resistance, appearance. |
| SETAL A F 681 TBA | Wood external trim | 60% - 70% | 45% - 50% | Through-drying and yellowing resistance. |
| SETAL A U 601 TB | Wood external trim | 65% - 70% | 30% - 40% | Rapid drying, hardness. High abrasion resistance and long-term flexibility. |
| SETAL A U 601 HV TBA | Wood external trim | 55% - 65% | 25% - 35% | Hardness and flexibility, high wear, abrasion and water resistance. resistance to household chemicals. |
| SETYRENE™ 78 XS-55 | Topcoat, air drying | 45% - 55% | 25% - 30% | Drying, appearance. |

innovation forward

https://allnex.com/getmedia/f7f51d17-bb2c-47fd-9527-6da07e2b2deb/0141_ALRenewables_web.pdf

# Arkema




Develop more sustainable interior coatings with Arkema's high-performance bio-based technologies. At the core of the formulation, **SYNAQUA® 4856** delivers the durability and film quality of a modern waterborne alkyd while offering an impressive 97% bio-based content, significantly lowering carbon footprint and reducing dependence on fossil resources.

For optimized handling and smooth, consistent application, **COAPUR™ 3020 BB and COAPUR™ 817 BB** ensure efficient rheology control with 93% bio-based content, supporting cleaner formulations that help preserve indoor air quality.

To complete the system, **COADIS™ 123 K and COADIS™ 790 hydrophobic dispersants** provide strong pigment stabilization, delivering long-lasting color, improved water resistance, and enhanced washability—also with 93% bio-based content.



https://coatingmaterials.arkema.com/en/markets/decorative-coatings/bio-based/

# Berkem




PRESS RELEASE

## Groupe Berkem launches its range of 100% bio-based alkyd resins aimed at the construction paints market

- **Commercialization of 100% bio-based alkyd resins: an unprecedented innovation on the paints market**
- **Products that are competitive with conventional products, essential given the substantial volatility of the oil market**
- **Alternative sustainable solutions guaranteeing a similar performance**
- **Strong synergies of Groupe Berkem's activities leading to the product range's transformation towards bio-based solutions**

https://construction.groupeberkem.com/wp-content/uploads/2025/05/brochure-groupe-berkem-resines-238x240-fr-en-janvier-2025-bd.pdf

# Ecoat

| | PRODUCT | % SOLID CONTENT | ARCHI | WOOD | METAL | % BIOBASED +/- 3% based on EN16640(B) & ASTM D6866-22(B) | ADDED VALUE |
|---|---|---|---|---|---|---|---|
| | INOKEM® 1101 Conventional alkyd emulsion | 50% | X | X Trim coatings | | | Conventional alkyd for blends with Styrene-Acrylics, EVA<br>• Competitive and low color<br>• Mainly used as **co-binder** for acrylic (20/30% in blend) |
| Bio-based Alkyd emulsion | SECOIA® 1400 | 50% | X | X | | 98% | The best candidate combining performance & lowest carbon footprint for decorative wall paints<br>• **low VOC** binder, allowing low VOC emission paints formulation<br>• Drastically enhances **carbon footprint reduction**<br>• Versatile binder (37% oil length) for indoor wall paint & trim paint<br>• Binder for **premium performances** (wet scrub , hiding power, stain resistance) |
| Bio-based Alkyd emulsion | SECOIA® 1501 | 50% | X | | | 89% | First steps into decarbonization & ideal for indoor white range paints<br>• **Low VOC & low yellowing** binder, allowing low VOC emission paints formulation<br>• **Cost-competitive**<br>• Compatible with conventional water-based binders to **initiate ecological transition** without compromising the performances |
| Bio-based Alkyd emulsion | SECOIA® 4487 | 47% | | X Impregnation | | 96% | A singular biosourced surfactant free solution for deep impregnation in wood<br>• Bio-sourced **pickering technology**, allowing low VOC emission coatings formulation<br>• **Maintain natural wood aspect**<br>• Especially designed for deep impregnation **& non film-forming** products (decking oil , furniture oil, cladding) |
| Polyurethane Alkyl modified dispersion (APU) | INOKEM® UR 3301 | 40% | X | X Trim coatings | X | 50% | Versatile reference : the good combination between adhesion, flexibility and protection<br>• Compatible with acrylic, SA, vinylic and PUD<br>• Indoor : ideal for trim paint.<br>• Outdoor : designed **for multi-substrates coatings (wood, metal, aluminium, PVC...)** |
| Polyurethane Alkyl modified dispersion (APU) | INOKEM® UR 3304 | 40% | | X Glossy Top coat | X | 47% | Appreciated for its good chemical resistance , adhesion & metal protection<br>• Quick drying & Hardness development<br>• Indoor : interior multi-purpose paints and wood varnish<br>• Outdoor : metal paints |
| Polyurethane Alkyl modified dispersion (APU) | INOKEM® UR 3308 | 40% | (X) | X Protection | | 66% | Designed for industrial wood coatings for primer or impregnation<br>• Chemical resistance, **Micro-porous**<br>• Low water uptake, **good weather & temperature variation resistance**<br>• **High stain resistance** |
| Polyurethane Alkyl modified dispersion (APU) | INOKEM® UR 3309 | 40% | | (X) Hard Top coat | X | 47% | Hydrophobic technology designed for Direct To Metal outdoor paint & varnish<br>• **Outperforming corrosion protection** even without anti-corrosion pigment<br>• Provide excellent water & chemical resistance combined with **good gloss retention, Fast drying &, High hardness**<br>• Lower VOC & Carbon footprint compared to benchmark technologuies (PUD, Acrylics, Solventborn coatings) |
| water reducible | INOKEM® 3840-75 | 75% | X | X | X | | Chain stopped short oil water dilutable alkyd resin<br>• Binder for Top Coat and primer; 1K or 2K application<br>• IOH = 2% |
| water reducible | INOKEM® 3836-70 | 70% | | X | X | | Short oil water dilutable alkyd resin<br>• **Highly flexible and fast drying binder for Top Coat and primer**; 1K or 2K application<br>• IOH = 2,4% |

V 05.01.2024

### SECOIA® 1400

**Ultra low carbon footprint & outstanding performances in sole binder formulations**

- VERY LOW VOC (<1g/L)
- LOW ODOR
- VERY GOOD APPLICABILITY & OPEN TIME (ALKYD TOUCH)
- HIGH SCRUB RESISTANCE

*Know more*

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 99%

98% BIOBASED INDEX*



### SECOIA® 1501

**Competitive solution to lower the carbon footprint of indoor paints**

- VERY LOW VOC (<1g/L)
- REDUCED YELLOWING COMPARED TO ALKYD MARKET
- REFERENCES IDEAL FOR FIRST STEPS INTO DECARBONIZATION

*Know more*

USDA CERTIFIED BIOBASED PRODUCT PRODUCT 89%

89% BIOBASED INDEX*



**according to Cbio EN16640 analysis*

### INOKEM® 1101

Short-oil water-based alkyd. *Conventional grade for blending*

### INOKEM® UR 3301

Short-oil water-based. *Polyurethane modified alkyd (APU) Multi substrate*

*Know more*

### INOKEM® UR 3308

Medium-oil water-based APU. *Excellent penetration and blocking effect*

*Know more*

66% BIOBASED INDEX*

**according to Cbio EN16640 analysis*

https://www.ecoat.fr/service/architectural-coatings/

# Umicore



## Bio Alkyds for a Sustainable Future in Alkyd Paint Chemistry

At Umicore, we are committed to directing our **research and development** towards a **greener future**. Within our alkyd resin portfolio, we have developed a solution derived from **vegetable raw materials** that achieves an **80% bio-based content**.

But we are not stopping there. We are currently creating a **second-generation product** that aims to nearly reach the **100% bio-based content milestone**! Visit our product page for the **VALIRES RB 085.88 soya alkyd resin** to find out more.

## Bio Alkyd - VALIRES RB 085.88

### Soybean Fatty Acid-based Alkyd with 80% Bio Content



VALIRES RB 085.88 is a soybean fatty acid-based alkyd at 85% solids. The product is composed out of 80% bio-based content. The resin is used for top-quality, high-solids decorative gloss enamels.

### Technical Specifications of Bio Alkyd - VALIRES RB 085.88

| | |
|---|---|
| Physical Appearance | Liquid |
| Color | Yellow-orange |
| Viscosity 25°C (dPa.s) | 40-50 |
| Acid Value (mg KOH/g) | 8 |
| Non-Volatile Content (%) | 85 |

## Long Oil Alkyd - VALIRES RE 170.06

### Long Oil Alkyd for Decorative Alkyd Enamel Paints and Varnishes



VALIRES RE 170.06 is a long oil, soybean-based alkyd at 70% solids, dissolved in D40. The resin is a general-purpose neat alkyd for decorative finishes.

### Technical Specifications of Long Oil Alkyd - VALIRES RE 170.06

| | |
|---|---|
| Physical Appearance | Liquid |
| Color | Yellow, amber |
| Solvent | Dearomatized hydrocarbon mixture with a flash point of 40° Celsius. |
| Viscosity 25°C (dPa.s) | 47-62 |
| Acid Value (mg KOH/g) | 10 |
| Non-Volatile Content (%) | 70 |
| Density 20°C (g/cm3) | 0.95 |
| Oil Type | Linoleic rich |
| Oil Length (%) | 65 |
| Polyol | Penta |

## Medium Oil Alkyd - VALIRES RE 050.87

### Medium Oil Alkyd for Fast Drying Finishes, Excellent Color Retention



VALIRES RE 050.87 is a medium oil, soybean-based alkyd at 50% solids, dissolved in D40. The resin is a general-purpose neat alkyd for fast drying finishes with excellent color retention.

### Technical Specifications of Medium Oil Alkyd - VALIRES RE 050.87

| | |
|---|---|
| Physical Appearance | Liquid |
| Color | Yellow, amber |
| Solvent | Dearomatized hydrocarbon mixture with a flash point of 40° Celsius. |
| Viscosity 25°C (dPa.s) | 30-40 |
| Acid Value (mg KOH/g) | 12 |
| Non-Volatile Content (%) | 50 |
| Density 20°C (g/cm3) | 0.93 |
| Oil Type | Linoleic rich |
| Oil Length (%) | 55 |
| Polyol | Penta |

## Soya-based Alkyd - KB 112 EU

### Low-odor, Soya-based Alkyd for Great Pigment Wetting



KB 112 EU is a soy-based alkyd with good pigment wetting, relatively low polarity and good compatibility with printing ink distillates and hard resins. The product improves strength development in flush and dry grind processes. Further benefits include excellent gloss, flexibility and low-odor properties, making it a good choice for use in food and cosmetic packaging inks. The product is both used in grinding/wetting vehicles, as well as for formulating sheetfed, coldset and heatset ink vehicles.

### Technical Specifications of Soya-based Alkyd - KB 112 EU

| | |
|---|---|
| Physical Appearance | Liquid |
| Color | Yellow |
| Color (Gardner) | Max. 8 |
| Viscosity 23°C (dPa.s) | 350-450 |
| Acid Value (mg KOH/g) | Max. 10 |
| Non-Volatile Content (%) | Min. 99 |

innovation forward

https://csm.umicore.com/en/metal-carboxylates-organics/products/valires-rb-085-88

# Worlee

## Water-based alkyd resins

**WorléeSol VGT 8709**
With 97 % renewable raw materials content, the new binder WorléeSol VGT 8709 is especially environmentally friendly and is receiving top marks in the Worlée portfolio. The solvent-free, medium oil, specially modified alkyd emulsion is used in water-thinnable decorative and architectural paints as well as interior wall paints and wood stains with good hardness development.

**WorléeSol NW 474**
This long oil modifid, amine- and co-solvent free alkyd emulsion is ideally suitable for the manufacturing of wood care products (e.g. teak and bangkirai) and wood protecting stains.

**WorléeSol 31**
This water soluble, modified linseed oil can be used for the manufacturing of wood protecting stains, wood care oils and impregnations with excellent penetration.

## Water-thinnable alkyd resin

**WorléeKyd C 9002 W**
When the development of odours is undesired: WorléeKyd C 9002 W is a medium oil alkyd resin, which is especially suitable for the manufacturing of aqueous interior wall paints and which, in comparison to other alkyd resins, is almost odourless. In formulations it shows high filling properties and hiding power, good elasticity and very good processing properties.

## Solventless alkyd resins

**WorléeKyd RL 1290**
WorléeKyd RL 1290 is an extremely low viscous alkyd resin. It is especially suitable for the manufacturing of low VOC and VOC-free 1k and 2k parquet-, terrace- and maintenance oils as well as wood stains and varnishes. It shows very good penetration, permanent elasticity and weather resistance. By addition of 10 - 30% Tolonate HDT-LV (Vencorex) good drying and highly durable systems in the range of parquet and terrace oils can be achieved. In such 2k-systems WorléeKyd VP RL 1290 has long processing times (pot life).

**WorléeKyd L 7904**
A very low viscosity alkyd resin for extreme weather conditions. WorléeKyd L 7904 is particularly suitable for the manufacturing of high solid glazings, clear lacquers and high solid anticorrosion primers. It distinguishes itself through excellent permanent elasticity and extremely good weather resistance.

**WorléeKyd V 5241 U**
Due to the urethanisation, fast drying and good hardness development are achievable with this long oil alkyd resin. The low viscosity allows the formulation of impregnations, glazings, wood care oils and wood paints with reduced solvent content.

**WorléeKyd S 23**
This alkyd resin is soya oil based. It can also be used as co-binder in conventional offset printing inks.

08/29/2022

### Bright Coatings project: Implementation of a 100% biobased alkyd coating

Altogether 10 partners have started the Bright Coatings project with the goal to demonstrate the implementation of a 100% biobased alkyd coating. Bio-aromatic MPA (3-methylphthalic anhydride), will be used to formulate new biobased resins for alkyd coatings which will be applied on an electric wheel loader. The project is co-funded by the European Regional Development Fund under the REACT-EU programme.

Partners of the project include Consun Beet Company, Lenzing and Vertoro for the bio-waste, TNO, Biorizon and Relement for theconversion to (aromatic) building blocks, Worlée-Chemie for the resin synthesis, Baril Coatings for the production of the paint formulation and Straalbedrijf aswell a Tobroco Giant for the coating application on the electric wheel loader.

The whole process is highly innovative, since the bio-aromatic compound bio-MPA is the missing link in the production of a 100% biobased alkyd coating. The produced bio-MPA can be used as a high performance, competitive alternative for fossil based compounds. It allows the resins and coatings market to use 100% biobased performance alkyd coatings.

**Contact**
Dr.ir. Toine Biemans
Head of Research and Development
Tel.: +49 4153 596 4760




innovation forward

https://www.tri-iso.com/documents/Worlee_Renewable_Brochure.pdf

https://www.worlee.de/en/news-events/news-detail/bright-coatings-project-implementation-of-a-100-biobased-alkyd-coating

## Contact

pieter.samyn@sirris.be

innovation forward