

# Sustainability with Evonik

Bio renewable content of  
additives for ink

Dr. Kai Yang

Head of Applied Research & Technology,  
Printing inks, Americas

Chicago Printing Ink Production Club 2024



# Agenda

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- 1 What does sustainability mean? 3**
- 2 How could we achieve our sustainability goals? 11**
- 3 Renewable, recycle resource and mass balance approach 17**
- 4 Evonik offering to improve your sustainability 22**

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# Sustainability is a broad wellbeing concept

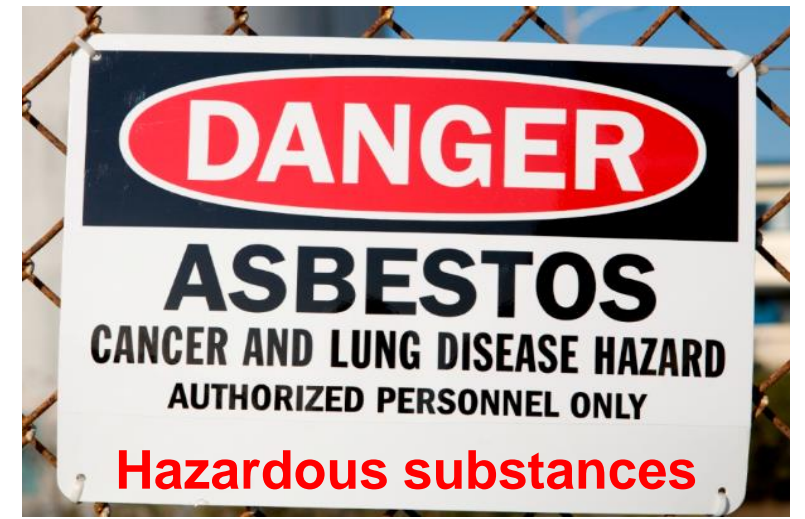
The concept was created to encompass more than only the environment.



**Air pollution**



**Water pollution**



**Poverty & inequality**

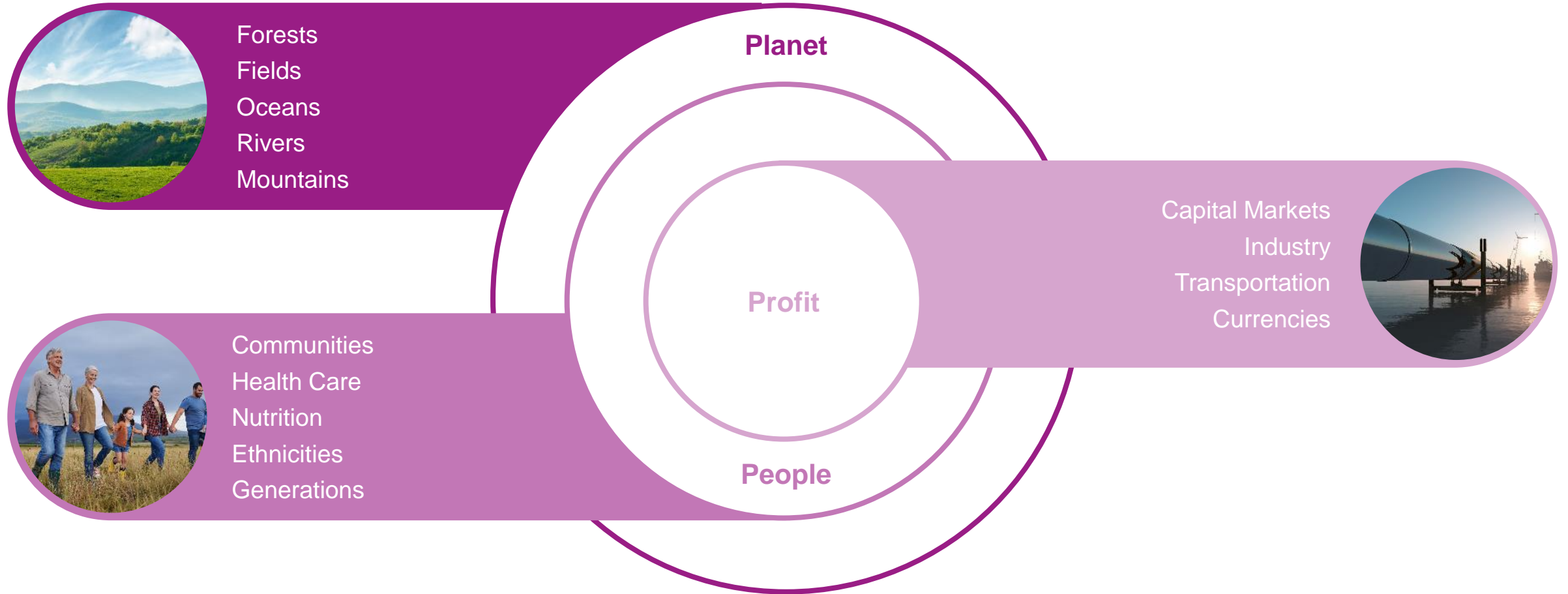


**Forced labor**



**Global warming**

# Sustainability is a threefold risk mitigation concept: planet, people and profit



# How to standardize and create global alignment on sustainability?

U.N. Member countries agreed to the SDG, the global framework to steer and track sustainable goals.



# SBTi - Science Based Target Initiative (CO<sub>2</sub> emission reduction goals)

Customers are increasingly demanding for certification. Almost 20% of Evonik's revenue is with SBTi committed customers

SBTi unites targets  
CDP, UN Global  
Compact, World  
Resource Institute  
and WWF

Partner organizations



## What is SBTi?

- **Only global initiative** that addresses the 1.5°/2° C climate targets of the Paris Climate Agreement
- Measures **independently** companies and organizational climate goals
- Creates **transparency** and **validity** for a global standard set of measurement

## What are the SBTi Goals?

**Industries CO<sub>2</sub> goals to reduce scope 1 & 2 emissions including supply chain measures to reduce scope 3.**

- 1.5°C target: 4.2% p.a. reduction of Scope 1 & 2 CO<sub>2</sub> emissions
- 2°C target: 2.5% p.a. reduction of Scope 1 & 2 CO<sub>2</sub> emissions
- 1.23% p.a. reductions of Scope 3 CO<sub>2</sub> emissions including suppliers

## Why are our customers interested in SBTi?

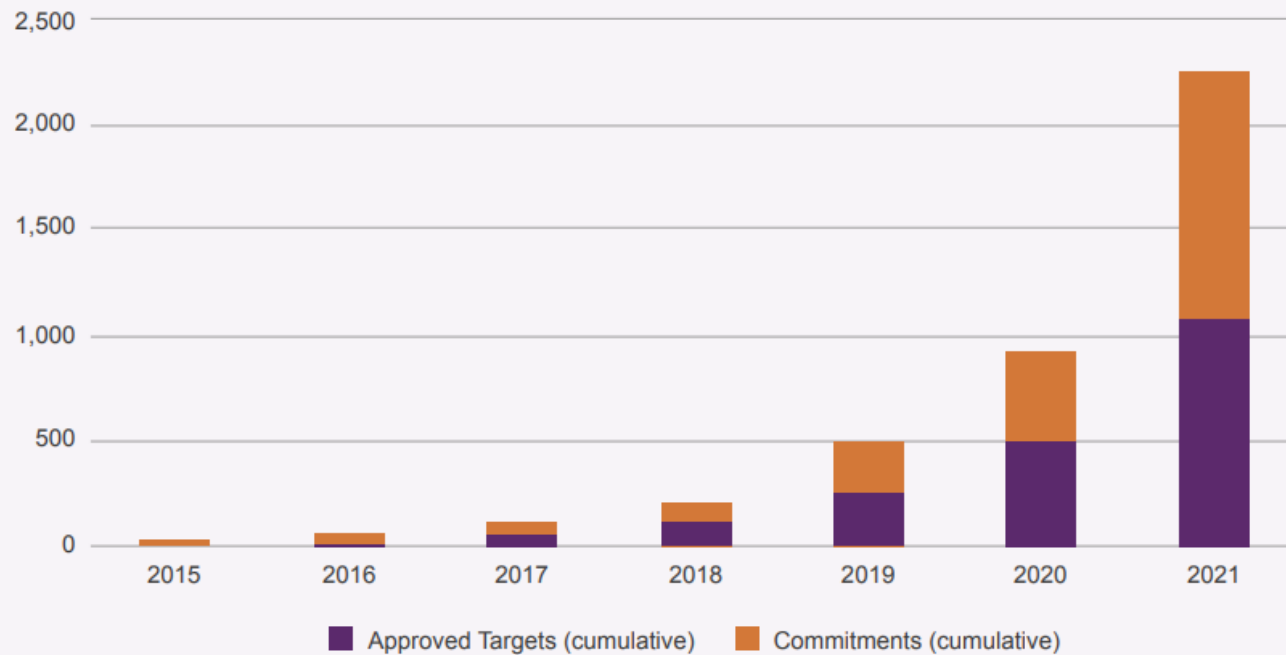
- Increasing number of customers are committing to SBTi targets
- SBTis request them to involve their suppliers
- Their clients are asking for SBTi commitment

**Note:** A list of companies committed to the SBTi can be found at <https://sciencebasedtargets.org/target-dashboard>

# More than 5000 companies are engaged with SBTi to take action to reduce CO<sub>2</sub> emissions. The number of companies more than doubled since 2021.

## A RECORD YEAR FOR NEW APPROVED TARGETS AND COMMITMENTS

Annual cumulative number of companies with approved targets and commitments, 2015–2021.<sup>8</sup>



## YTD 2023: 5234 companies listed in SBTi



### Companies report that adopting a science-based target:

- ✓ Boosts profitability
- ✓ Improves investor confidence
- ✓ Drives innovation
- ✓ Reduces regulatory uncertainty
- ✓ Strengthens brand reputation

Source: <https://sciencebasedtargets.org/resources/files/SBTiProgressReport2021.pdf>

<sup>8</sup> Sustainability with Evonik | Chicago Printing Ink Production Club | 202403



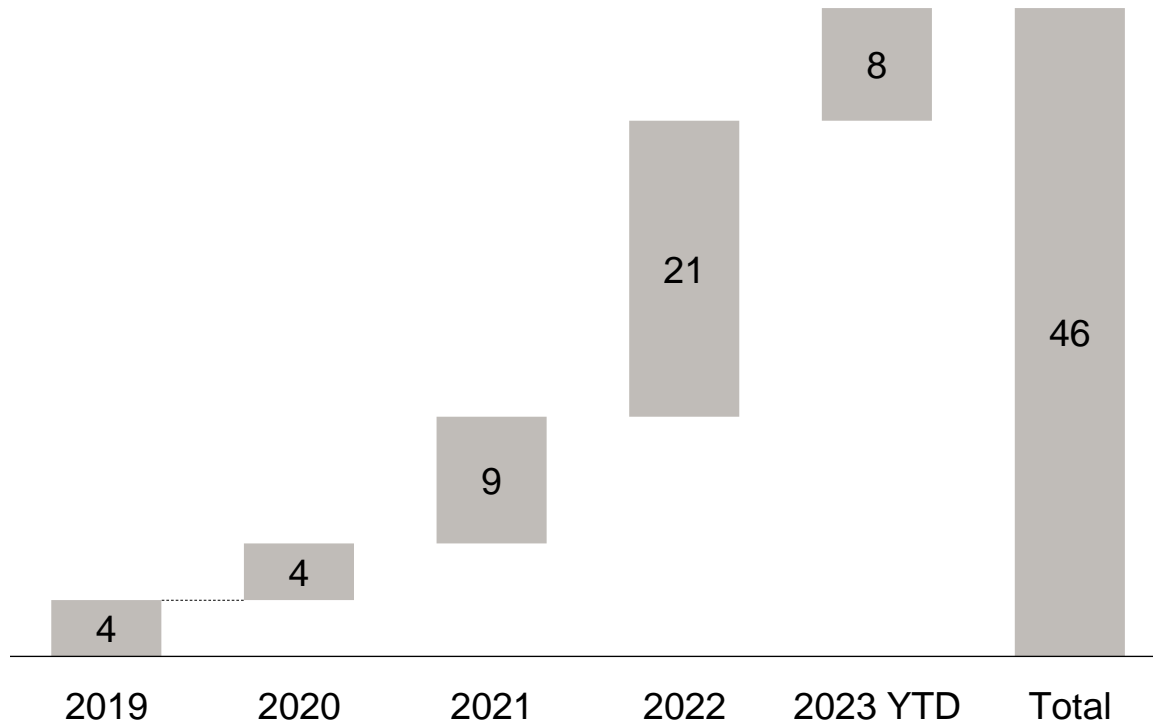
# Many companies in market segments that CAD supports have expressed SBTi goals

Building & Construction	FMCG	Industrial	Transportation	Packaging

# Coatings and Inks Formulators

The list of coatings and inks formulators have substantially increased in 2022.

## New SBTi commitments of coating and ink producers



## Example companies



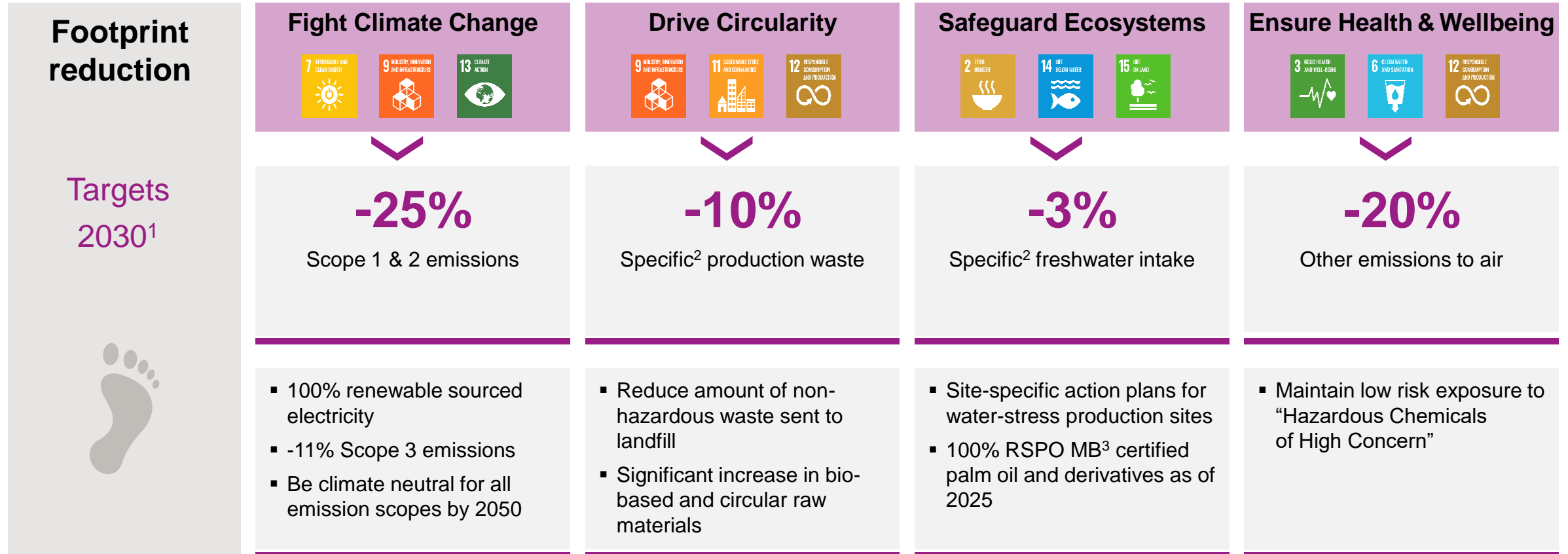
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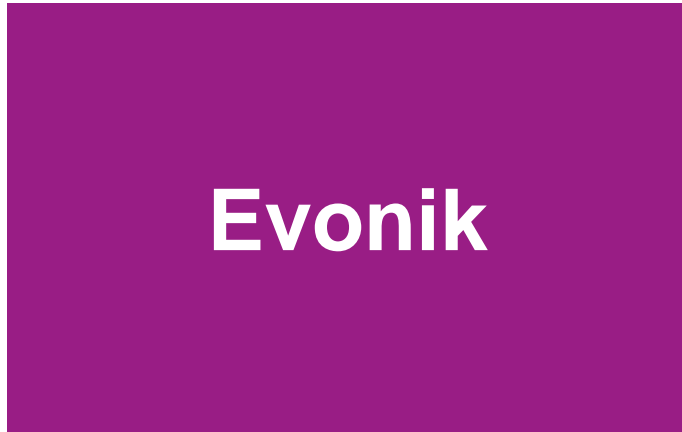
# Footprint: NEXTGEN Technologies Across all Four Sustainability Focus Areas

Measurable set of KPIs in place. Climate neutral by 2050.



1. reference year 2021; 2. Corresponding to the production volume; 3. RSPO MB: Roundtable on Sustainable Palm Oil Mass Balance

# Evonik well positioned in independent ratings<sup>1</sup>



<sup>1</sup><https://corporate.evonik.com/en/sustainability/sustainable-investment/sustainability-ratings-rankings>

# Definitions: Footprint and Handprint

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## Footprint = negative impacts

**covers all negative environmental and social impacts during manufacturing and shipping of the product:**

- Emissions from **purchased raw materials**
- Emissions from **utilities** used in plants (steam, electricity or natural gas)
- Emissions from **transport and logistics**
- Emissions caused by **waste**



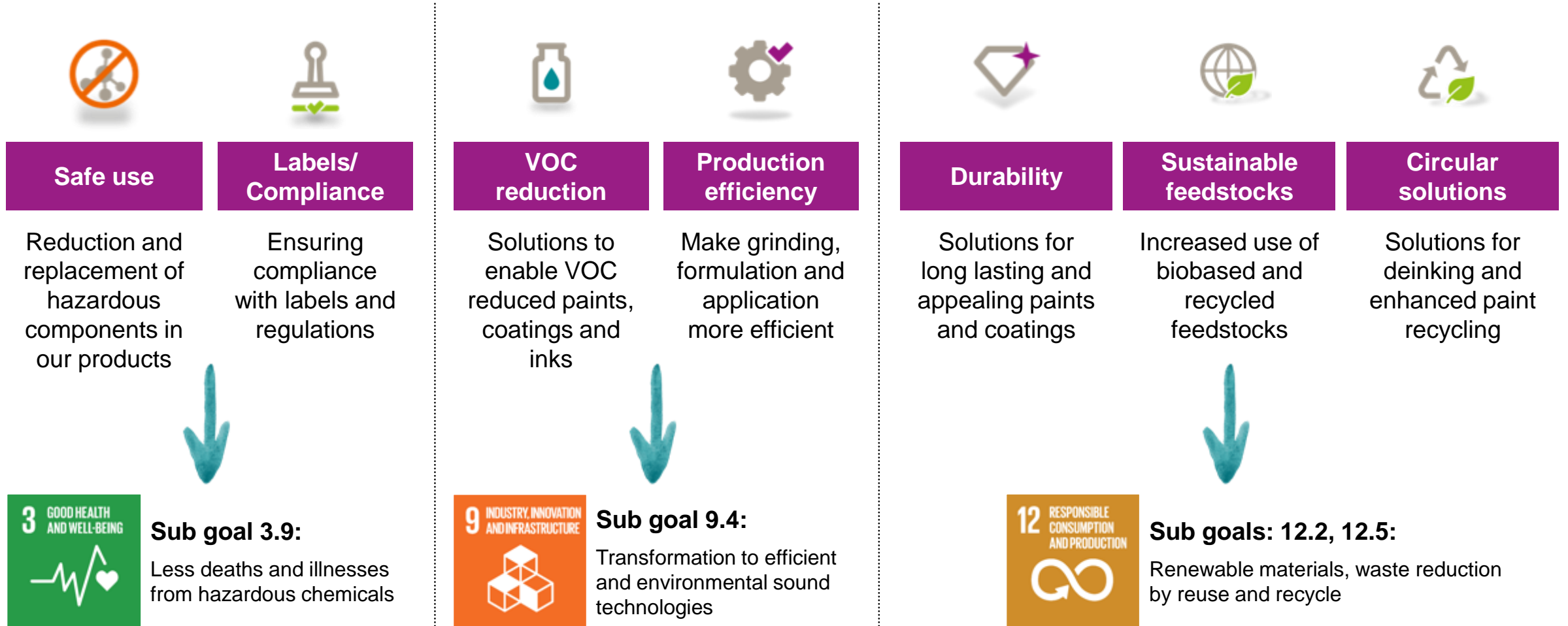
## Handprint = positive impacts

**Describes an improvement between an established and an improved solution**

- **Energy and material savings** by process additives
- **Extended lifetime** of objects, e. g. constructions, household hardware, electrical devices
- **Substitution of a disputed component** in a formulation

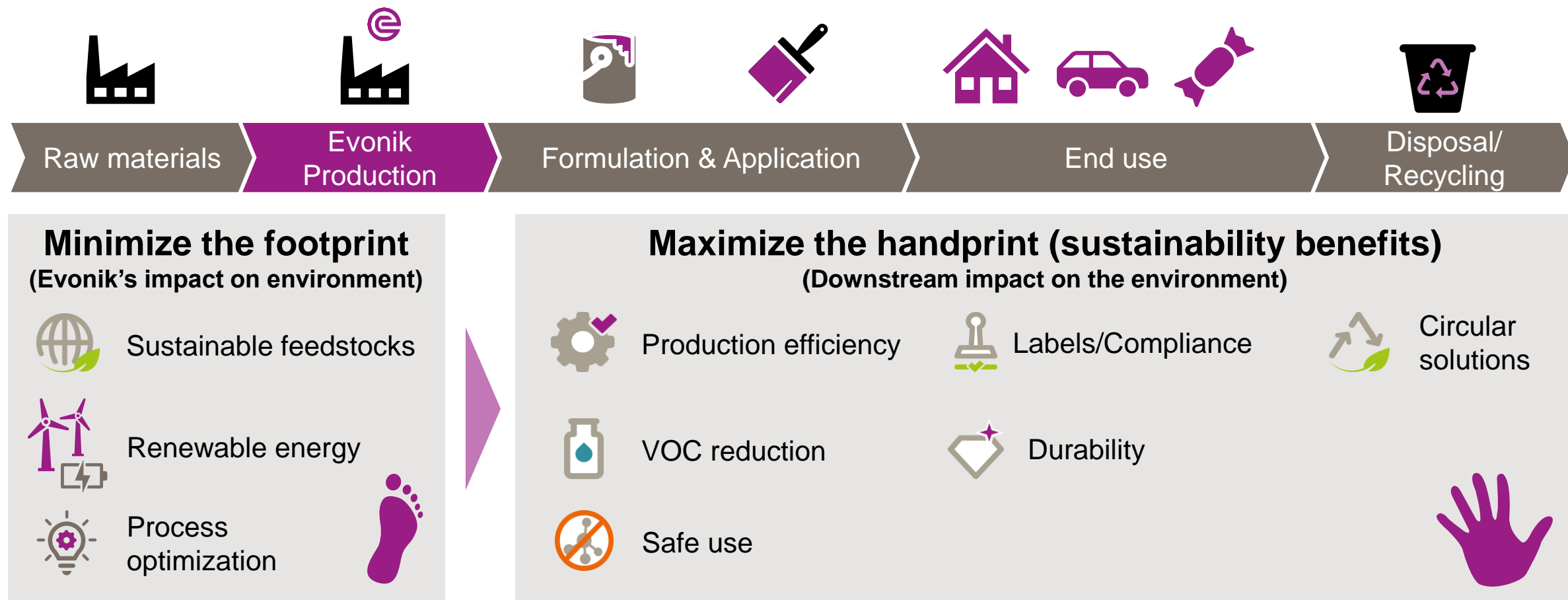
**A handprint is the difference between an established and the improved condition of a single environmental or social effect**

# The Seven Handprint Effects for Additives



# Enabling sustainability goals

We help customers by minimizing our environmental footprint and by maximizing their handprint. We organize our portfolio around 7 sustainability benefits to support customers achieve their goals.



**Note:** Circular solutions – Evonik is currently working on R&D projects to develop coatings & inks additives that either have recycled content or can enable better options for product end-of-life.



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# Renewable and recycled feedstock make it possible to produce more sustainable products

## Type of Feedstock

### Primary



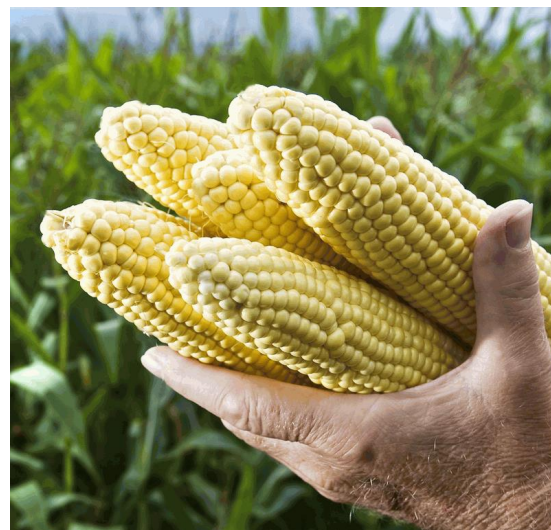
Fossil-based



Virgin fossil raw materials



BIO-based



Virgin agricultural raw materials



Recycled BIO-based



Waste materials of biological origin



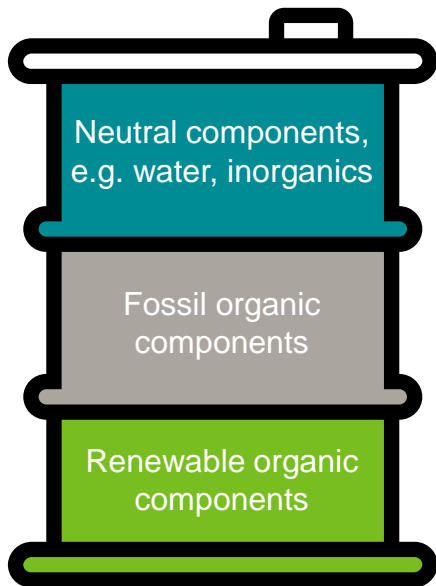
Recycled



Waste materials of non-biological origin

# Determination of the biobased content

## Product composition



## Material balance, wet

- Calculation of the renewables content via a material input/output balance
- Inclusion of all components, also water
- No analytics

Component type	Share
Water	20%
Other neutral comp.	10%
Fossil organic	30%
Renewable organic	40%
<b>Bio-content</b>	<b>40%</b>

## Material balance, dry

- Calculation of the renewables content via a material input/output balance
- Inclusion of all solid components, exclusion of water
- No analytics
- Standard: EN 16785-2 2018

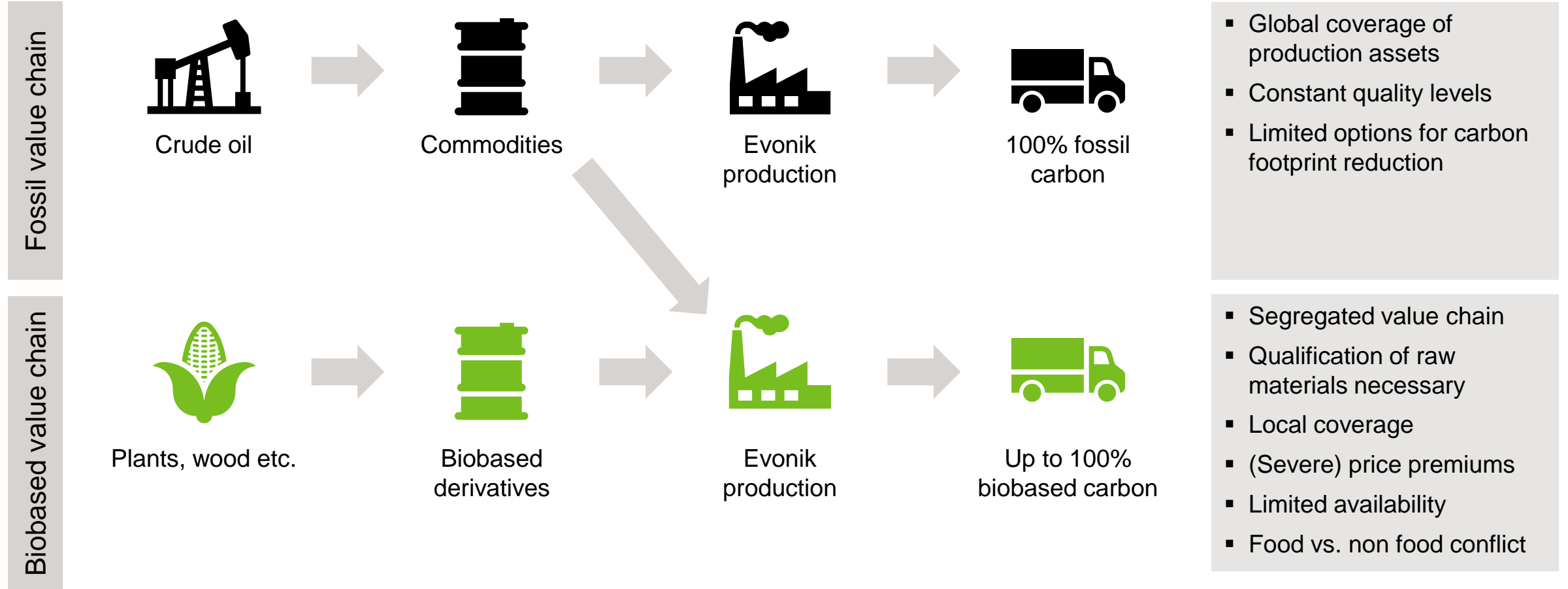
Component type	Share
<del>Water</del>	20%
Other neutral comp.	10%
Fossil organic	30%
Renewable organic	40%
<b>Bio-content</b>	<b>50%</b>

## Radiocarbon method

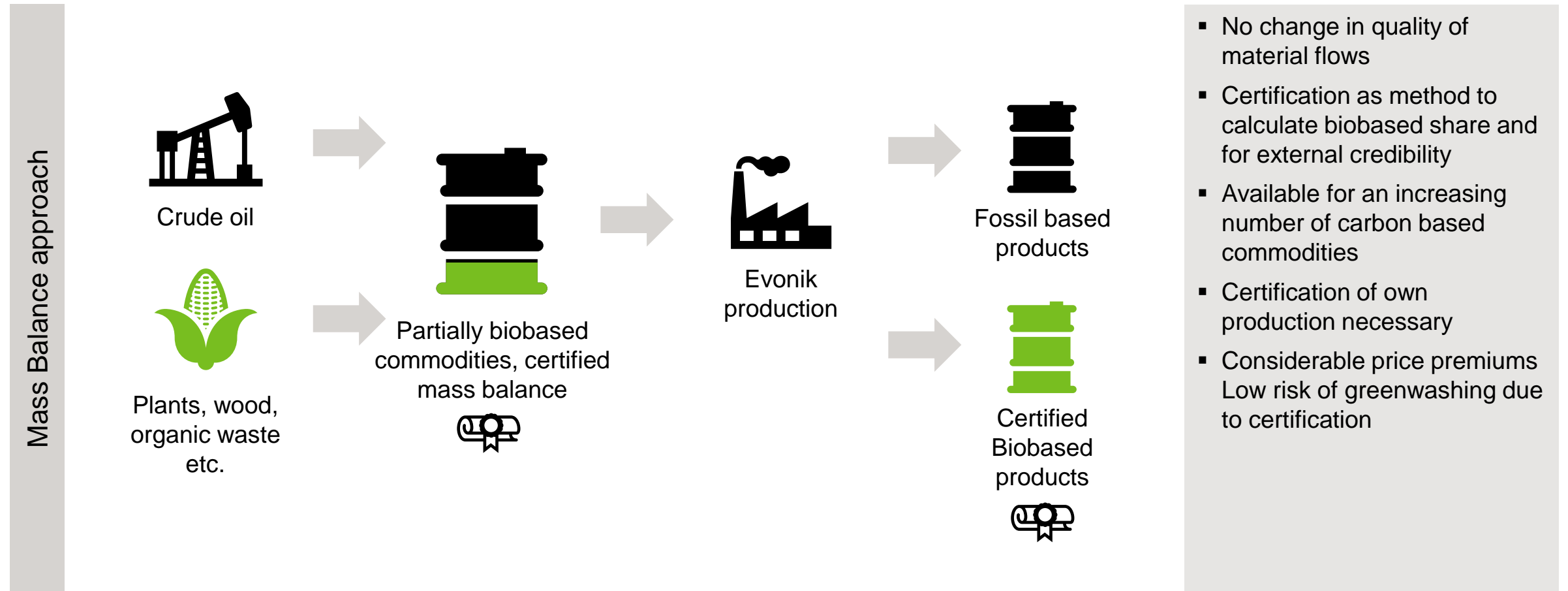
- Based on decay of <sup>14</sup>C isotopes to <sup>12</sup>C isotopes
- ASTM 6866-21

Component type	Share
<del>Water</del>	20%
<del>Other neutral comp.</del>	10%
Fossil organic	30%
Renewable organic	40%
<b>Renewable carbon content</b>	<b>57%</b>

# Currently CAD uses fossil based and segregated biobased raw materials for production of additives and resins



# The mass balance approach combines the use of established materials flows with a high potential for fossil carbon reduction



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## 2. Enabling sustainability goals

We have a broad portfolio that supports several different sustainability goals



### 1. Safe use

- 1.1 Alternatives to PFAS
- 1.2 Alternatives to APEOs
- 1.3 Toy & children safety compliance



### 2. Labels & compliance

- 2.1 Food contact portfolio & support
- 2.2 Eco-labeling & regulatory support



### 3. VOC reduction

- 3.1 Near-zero-VOC coalescing surfactant
- 3.2 Broad low-VOC portfolio
- 3.3 Powder coatings



### 4. Production efficiency

- 4.1 Grinding step elimination (E2D)
- 4.2 Faster curing: UV & LED
- 4.3 Universal inks dispersant
- 4.4 Universal substrate primers (inks)
- 4.5 Pigment dispersion optimization
- 4.6 Multifunctional additives
- 4.7 Formulating to reduce CO<sub>2</sub>



### 5. Durability

- 5.1 Burnish resistance
- 5.2 Scratch resistance (high-gloss)
- 5.3 Scratch resistance (matte & deep matte)
- 5.4 Water resistance
- 5.5 Mar resistance (wood coatings)
- 5.6 Anti-corrosion protection
- 5.7 Thermal insulation coatings



### 6. Sustainable feedstocks

- 6.1 Bio-based wetting & dispersing agents
- 6.2 Bio-based defoamers & deaerators

# 1.1. Alternatives to PFAS: Fluorosurfactant replacements



Legend:

- Fluorosurfactant chemistry benefit
- Evonik product that delivers similar benefit



For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://coatino.com/products)





## 2.1. Food contact portfolio & support

### Comprehensive regulatory coverage

- Swiss Ordinance ANNEX 10 (Lists A & B)
- 21 CFR FDA
  - 175.105 and 175.300
  - 176.170 and 176.180
- BfR XIV and XV (German ink ordinance)
- Mercosur
- Nestle
- Regulation (EU) 10/2011
- EuPIA
- China national food safety standard
- Japanese positive list for direct food contact

### Specific Migration Limit calculator

SML calculation for printing inks Restart ↻

according to Swiss Ordinance Regulation

ink deposition \*  g/m<sup>2</sup>    contact area  m<sup>2</sup> / 1 kg food    migration  %

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component \*     weight \*  %    ↻    ⊖

+

**Passed**

Based on the calculation parameters the formulation passed the SML-calculation.

No substance exceeded the SML-limit.

**New**  
**COATINO®**  
**SML-Calculator**  
Check compliance with your specific migration limits.

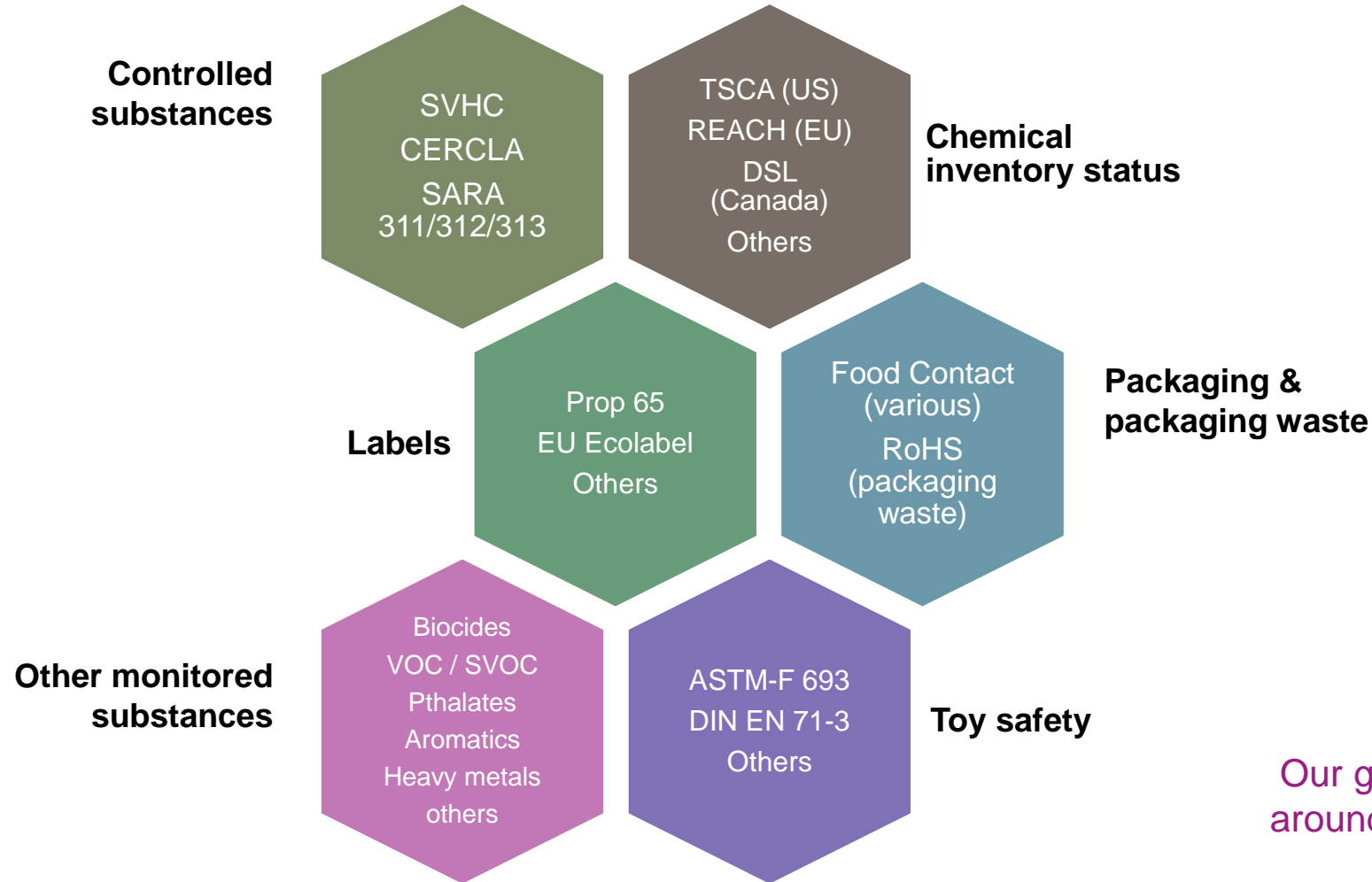
All confidential information is preserved. No NDA required

Try it at: [coatino.com/virtual-lab/sml](https://coatino.com/virtual-lab/sml)

Download the product regulatory guide: [https://products.evonik.com/assets/68/07/Product\\_Selector\\_Guide\\_Food\\_Contact\\_Regulatory\\_Information\\_EN\\_196807.pdf](https://products.evonik.com/assets/68/07/Product_Selector_Guide_Food_Contact_Regulatory_Information_EN_196807.pdf)



## 2.2. Eco-labeling & regulatory support



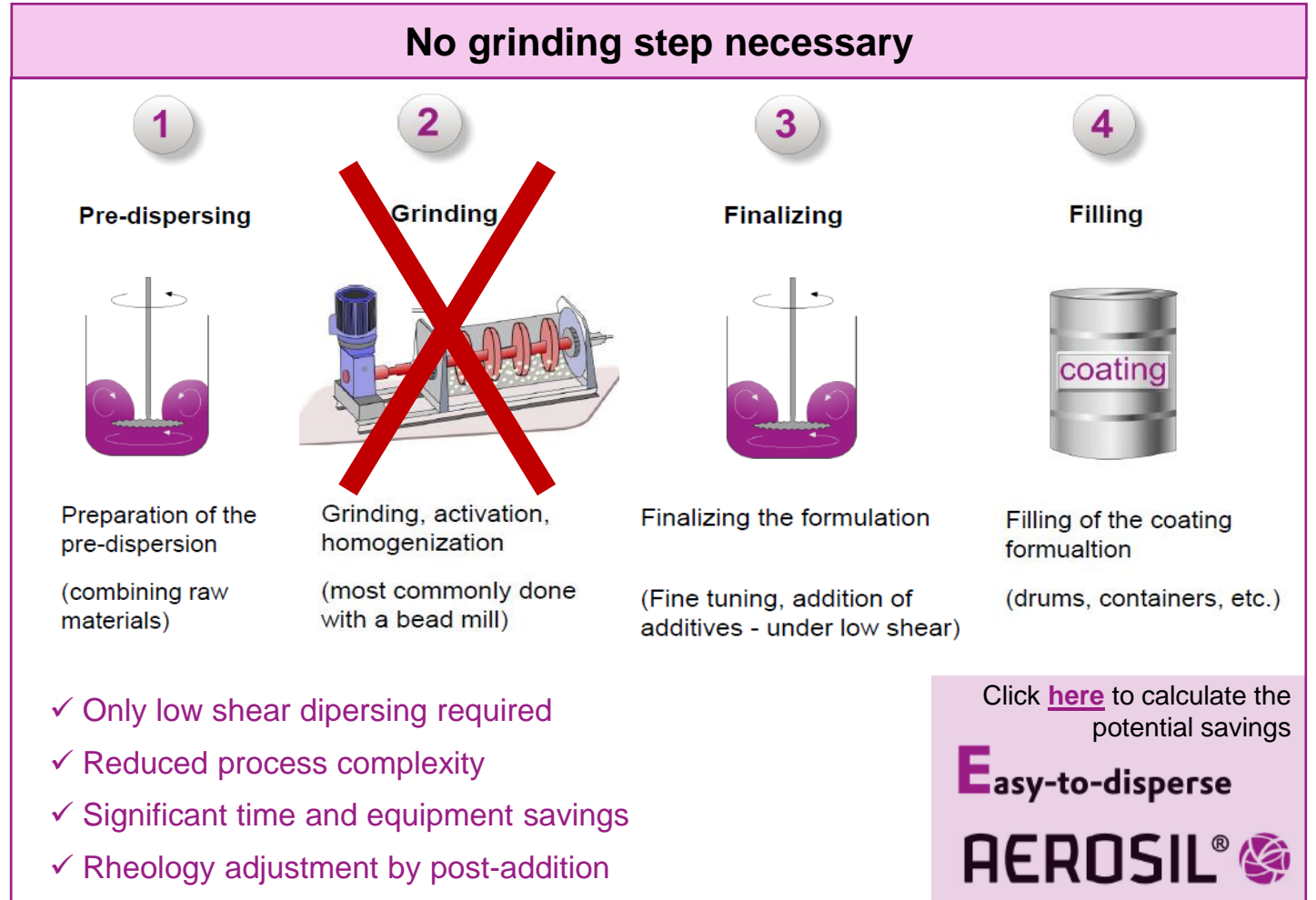
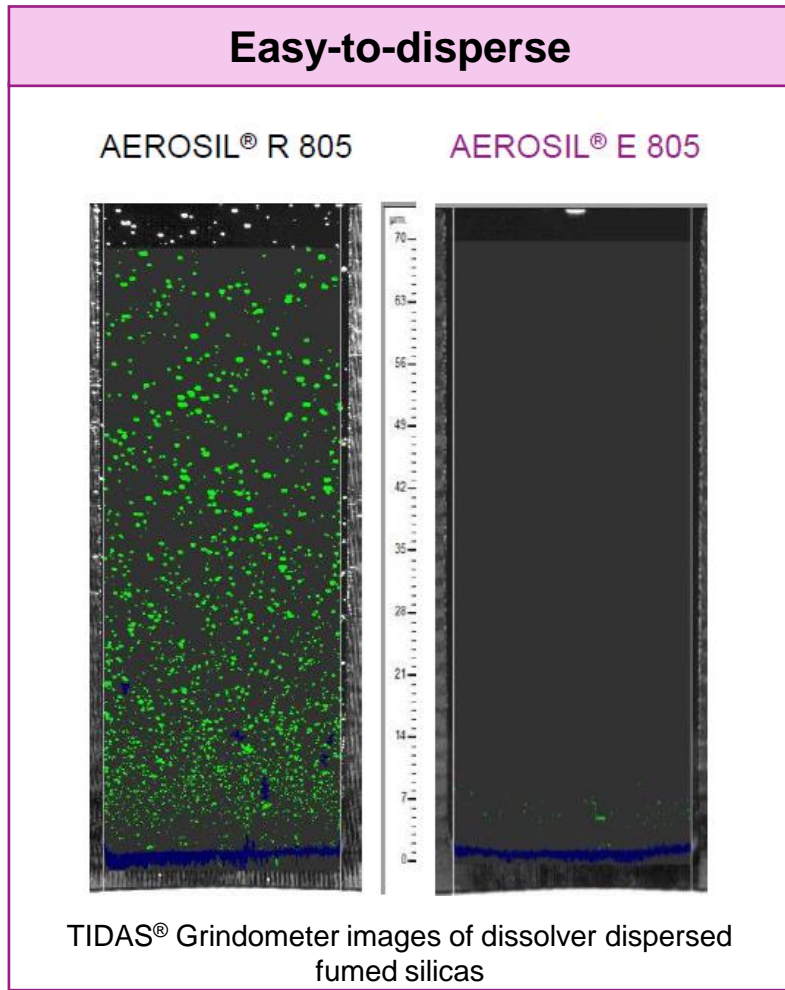
Our global team of experts monitors regulations around the world to help customers navigate the regulatory complexities.

E-learning, regulatory-based product search, chemical inventory status and more at: [coating-additives.com/en/responsibility/regulatory-guidance](https://coating-additives.com/en/responsibility/regulatory-guidance)



# 4.1. Grinding step elimination (E2D)

**AEROSIL® E:** Easy-to-disperse rheology modifiers that require less energy to incorporate.



For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://coatino.com/products)

## 4.4. Universal substrate primers (inks)

Primers enable the same ink to be used onto a variety of substrates, saving formulation work and change-over time to adjust ink for diverse substrates.

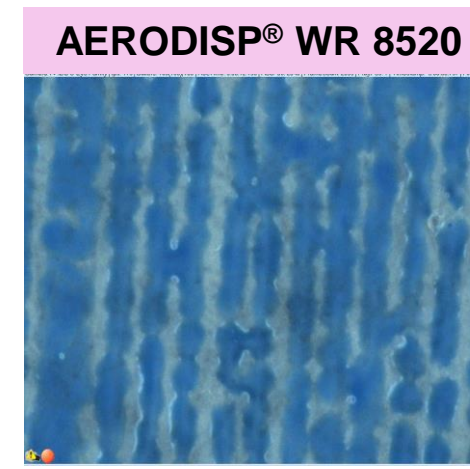
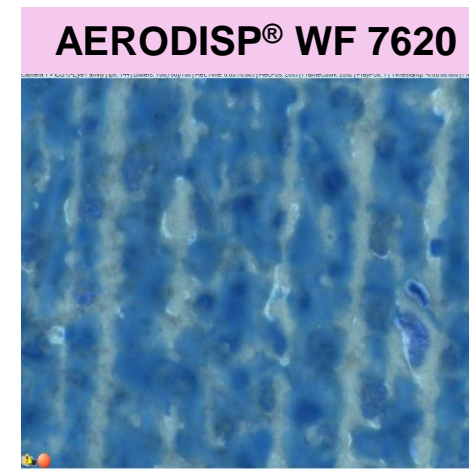
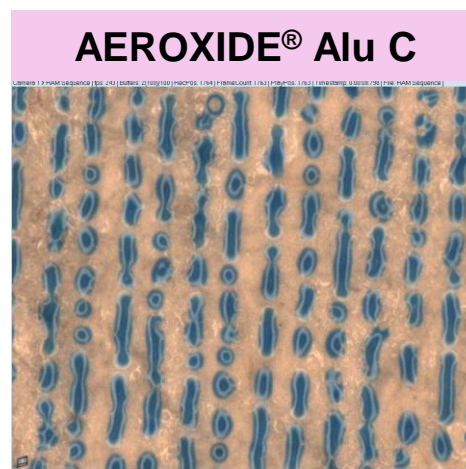


### Non-siloxane and short chain siloxanes offer great re-coatability

- **Non-siloxane** and **short chain siloxane** surfactants are good options for primers because of their great re-coatability.
- Wax and fluorinated surfactants need to be avoided.
- **Product recommendations:**
  - ✓ TEGO® WET 270
  - ✓ TEGO® Glide B 1484.
  - ✓ SURFYNOL®
  - ✓ DYNOL®

### Silica dispersions are effective in various substrates

- Fumed silica dispersion shows great efficacy in improving edge definition and dot accuracy in various substrates:
  - ✓ **Quick ink drops absorption** while **locking** the colorants with brilliant colors.
  - ✓ **Increase dot gain** and wetting performance on **non-absorbent** substrates.
- **Product recommendations:**



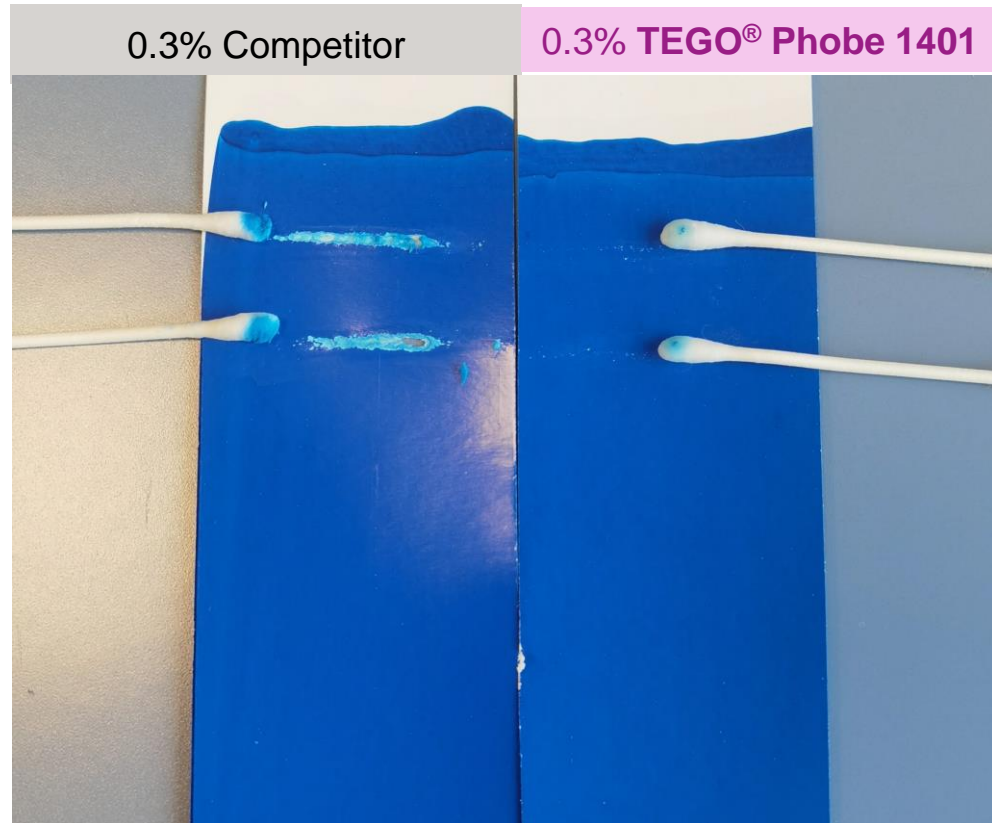
For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://coatino.com/products)



## 5.4. Water Resistance

**TEGO® Phobe:** Enables long-lasting and resilient hydrophobic performance in coatings and inks.

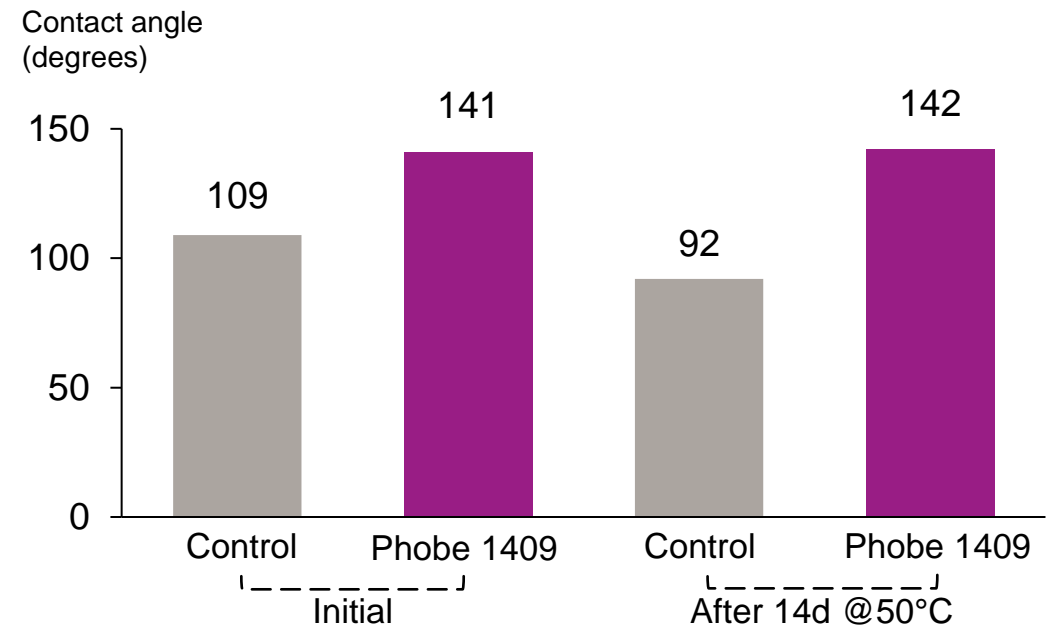
### Superior wet scrub resistance in inks



**Test method:** Rub printing ink by wet cotton swab 60x back and forth.

### Long lasting hydrophobic coating performance

#### Silicate paint with 3% TEGO® Phobe 1409



- ✓ Strong beading effect: Higher than 140° contact angle
- ✓ Enables fast drying building facades to prevent mold growth
- ✓ Eco-labeling possible

For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://www.coatino.com/products)



## 6.1. Wetting & dispersing agents containing bio-based raw materials

Bio-based content from non-food sources, leveraging responsible forestry and bio-mass suppliers

Product	Biobased content (wt.%)	Chemical description	Potential applications
<b>LIPOTIN® DB</b>	<b>100%</b>	Soya lecithin	Wetting & intermediate pigment stabilization in SB direct grinds or resin-containing dispersions; provides pseudoplastic flow behavior
<b>TEGO® COLOR AID 7060</b>	<b>77%</b>	Tall-oil fatty acid amide amine	Compatibilizer for universal colorants (all pigment types) in SB alkyd base paints; minimal impact on dry time
<b>TEGO® Dispers 1010</b>	<b>95%</b>	Polyester w/ pigment- affinic groups	Dispersing all pigments in low polarity SB/HS/100% direct grinds or resin-free pigment concentrates; leads to Newtonian flow behavior
<b>TEGO® Dispers 652</b>	<b>70%</b>	Fatty acid derivative	Dispersing inorganic pigments & fillers in SB/HS/100%; use in direct grinds, resin-containing or resin-free dispersions
<b>TEGO® Dispers 740 W</b>	<b>35%</b>	Nonionic fatty acid derivative	Improves long term stability and colorant acceptance; use in WB resin-free pigment dispersions or as a co-additive in base paints

For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://coatino.com/products)



## 6.2. Defoamers & deaerators containing bio-based raw materials

Bio-based content from non-food sources, leveraging responsible forestry and bio-mass suppliers

Product	Bio content	Chemical description	Functionality	System	Application
<b>TEGO® Airex 921</b>	<b>57%</b>	Polyester polyether mixture, silicone free	Deaeration in pigmented or clear formulations	Radiation-curable	Coatings, Inks & Varnishes
<b>TEGO® Airex 922</b>	<b>62%</b>	Organic polymers, silicone free	Deaeration in pigmented or clear coatings	SB/HS/100% solids	Floor & Industrial
<b>TEGO® Airex 944</b>	<b>25%</b>	Mixture of organic polymers & siloxanes	Defoaming & deaeration of pigmented coatings	SB/HS/100% solids	Floor & spray-applied industrial
<b>TEGO® Airex 990</b>	<b>50%</b>	Mixture of organic polymers & siloxanes	Deaeration in pigmented or clear coatings	SB/HS/100% solids	Floor & spray-applied industrial
<b>TEGO® Airex 991</b>	<b>63%</b>	Mixture of organic polymers & siloxanes	Defoaming & deaeration of pigmented coatings	SB/HS/100% solids	Floor & spray-applied industrial
<b>TEGO® Foamex 18</b>	<b>98%</b>	Hydrophobic organic polymer & particles	Letdown defoamer	Waterborne	Decorative paints
<b>TEGO® Foamex 832</b>	<b>50%</b>	Mixture of polyether & triglyceride	Defoaming of pigmented, compatible grind defoamer	Waterborne	Coatings & inks
<b>TEGO® Foamex 8850</b>	<b>98%</b>	Compound based on triglyceride, silica-free	Defoaming of pigmented formulations; use in letdown or as post-addition; broad food contact compliances	Waterborne	Printing inks
<b>TEGO® Foamex 8820</b>	<b>55%</b>	Based on vegetable oils	Defoaming of pigmented formulations; add in grind or letdown stage; broad food contact compliances	Waterborne	Coatings & inks

For more product information, including TDS, SDS and formulation guides check: [coatino.com/products](https://coatino.com/products)

# Conclusions

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- Sustainability is a complex subject
- Sustainable development is a partnership
- Additives can also play a role
  
- A journey... that we can take together



Photo: Stuart Hayes



