

With the contribution of the LIFE Programme of the European Union 

BioPAINT

A new goal for the sustainable innovation in wood coatings

collaborating partner

GreenDelta



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When you think of coatings, you usually think of:

AIR POLLUTION

=

Up to 50%
of VOC in Europe

**PETROLCHEMICAL
MATERIALS**

=

Low
resource-efficiency





We want to improve the sustainability of wood coatings:

**LESS NOXIOUS
MATERIALS**

=

**HEALTHIER
AND LESS
POLLUTING**

**LOWER CARBON
FOOTPRINT
(GHG contribution)**

=

**BELOW
2.4 Kg CO₂/kg**

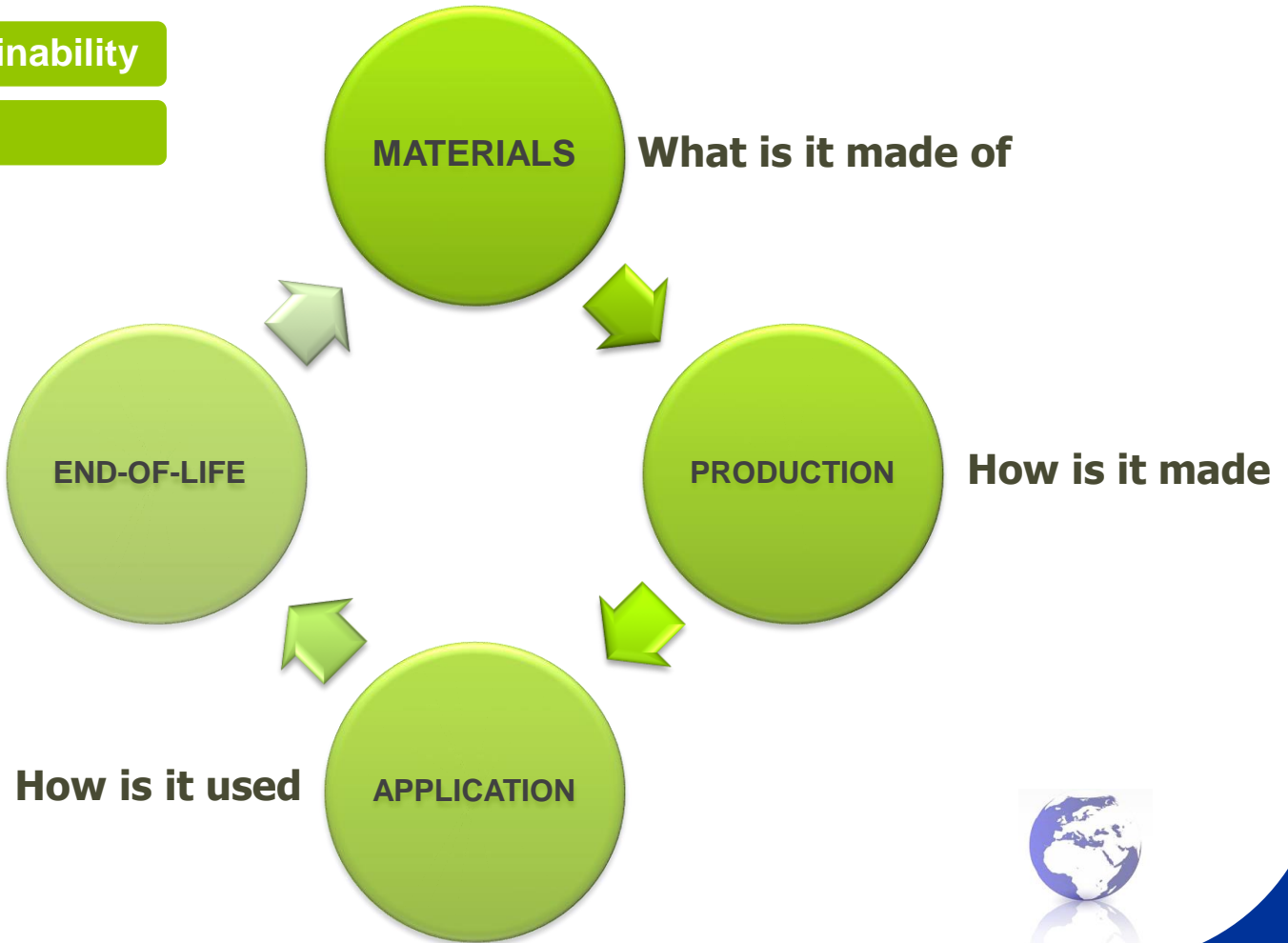




A product sustainability

depends on:

How long does it last and how is it disposed of





MATERIALS

PRODUCTION

APPLICATION

END-OF-LIFE

A sustainable coating must:

Be made from:

biorenewable sources

with low VOC

of low health risks

and low environmental impact

Be produced with:

low energy draw

low emissions and waste

high efficiency

low variability

Be applied with:

low energy draw

low emissions and waste

high efficiency and low variability

on renewable substrate

Guarantee:

long time in use

low health risks

low environmental impact





MATERIALS

PRODUCTION

APPLICATION

END-OF-LIFE

LIFE-BioPaint's coatings are:

Made:

from
biorenewable
sources

with very low VOC
emission

of low health risk
and low
environmental
impact

Produced with:

lower energy
zero emissions

higher efficiency

lower waste

lower variability

**100% UV, that
is applied with**

low energy
draw

no emissions

high efficiency

on wood, a
renewable
support

**High quality
products, hence:**

long useful life

low health risks

low
environmental
impacts





Wood coatings become sustainable solutions

**IVM is uniquely placed:
it produces
both resins and coatings**



**NEW RESINS
FOR NEW COATINGS**



from here...

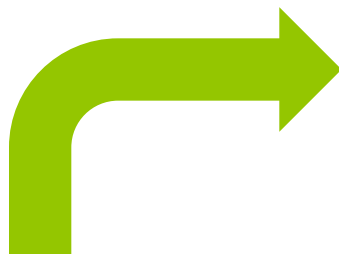


... to here





Paint production plants enter the 21st century



from here...



... to here





WHY UV100% COATINGS?

APPLICATION



- VOC-free** at application
- Little energy** for application
- Small laydowns**, small material demand
- Fast, efficient** production
- Minimal waste** at application

END-OF-LIFE



- Top mechanical and chemical** resistance surfaces
- Long lasting** products





MATERIALS

NEW RESINS

REPLACING

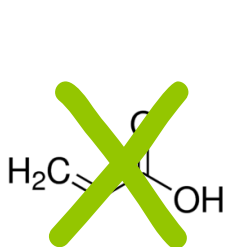
Safer

Biorenewable

**Low climate and environmental impact
(via LCA)**

COMPONENTS

**unsafe and polluting
with high climate
impact**





MATERIALS

NEW COATINGS

NO VOCs

Highest biorenewable content

**Minimal content of
dangerous chemicals**

(such as acrylates and styrene)

WITHOUT

- **bisphenols**
- **heavy metals**
- **benzophenones**
- **formaldehyde**
- **etc.**





MATERIALS

NOT JUST RENEWABLE



Formulated for minimal climate and environmental impact

Top world class sustainability certified with a complete **LCA**
(Lifetime Cycle Assessment) evaluation

LCA guides the selection of components
in the resin synthesis and in the coating formulation





Ensure that no **VOCs** are emitted

Consume **less energy** than current plants

Produce **no rejects and minimal waste**

Ensure **maximum product quality and reliability**





APPLICATION

THE NEW COATINGS WILL HAVE



maximum reliability

no variability

optimized performance





Type of impact	State-of-the-art	Estimated benefits
GHG emissions	105.6 Mg/year	-30%
VOCs	580 kg/year	-100%
Waste production	60 Mg/year	-100%
Energy consumption	300 MWh	-30%
Utilization of bio-based, green raw materials	-	+100%
Landfill disposal of hazardous by-products	60 Mg/year	-100%





LIFE is the main EU financing tool for environmental and climate progress

LIFE funds projects aiming to:

- Improve environment and health**
- Lower impact of human activities** on environment and climate
- Enhance greater biodiversity**
- Protect nature**

LIFE by numbers

2014-2020 budget = **€3,4 billions**
(increasing by 50%
in next budget period)

**Funding of LIFE-BioPaint certifies
IVM's technical capability
and commitment
to sustainable development**





LIFE-BioPaint Product Innovation

**Wood coatings
become sustainable solutions**





MATERIALS

IVM synthetic resin R&D team achievements

Binder made of biobased components for about 65%

Itaconic acid as biobased alternative to petrochemical building blocks

Synthetic process developed up to full production scale

Introduction of other biobased building blocks





MATERIALS

IVM radiation-cured products
R&D team achievements

Many paint formulations tested, for many different applications

- primers, putties, basecoats or sealers and topcoats
- mainly roll-coating, spray and vacuum coating too

Reducing petrochemical-based polyesters and acrylates
(hence reducing acrylic acid use)

On average, **about 50% biobased content**





MATERIALS

	Gloss (GU, 60°)	König pendulum (s)	Abrasion resistance (rel. scale)	Light fastness (greyscale)	Scratch resistance (N)	Thermal cycling (Pass/Fail)
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Topcoat alone

bio	15	90	89	4/5	0,6	Pass
std	13	98	100	4/5	0,6	Pass

Topcoat + Basecoat

bio	12	87	102	4/5	0,7	Pass
std	10	89	120	4	0,7	Pass

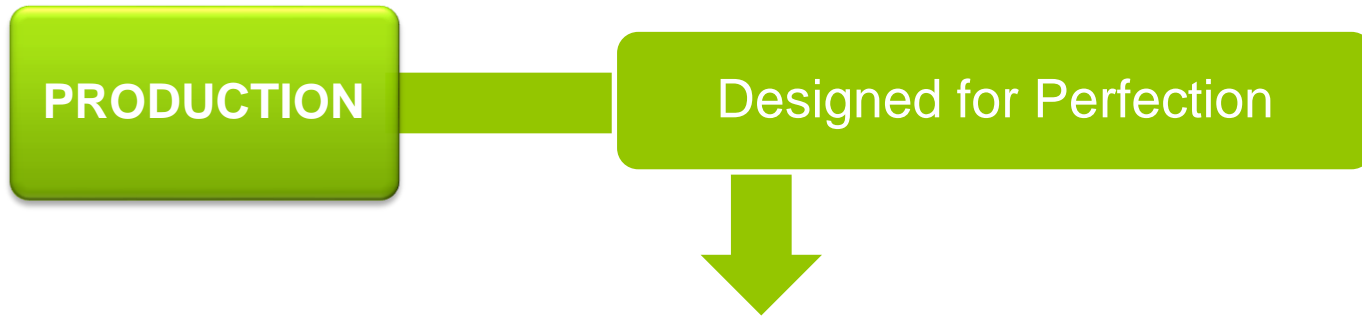




LIFE-BioPaint Process and Plant Innovation

Paint production plants enter the 21st century





wholly automated process with complete tracking

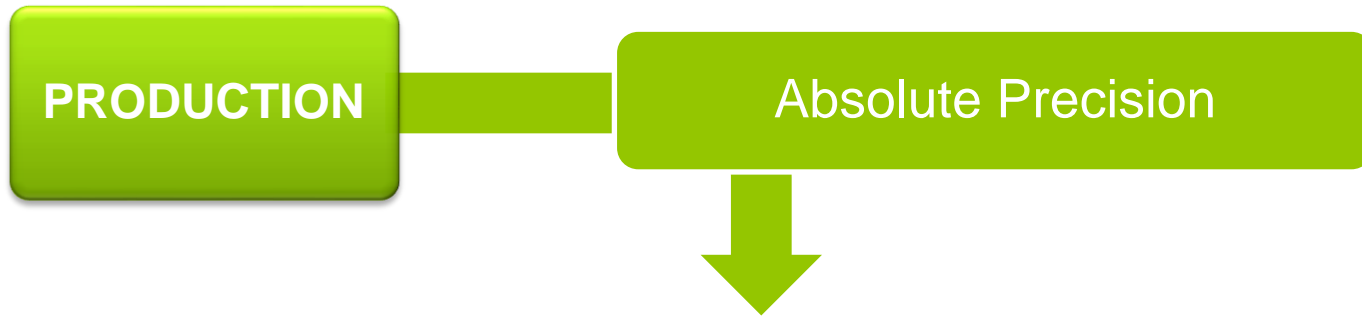
closed circuit – entirely temperature controlled

controlled atmosphere (no emissions or contamination from the environment)

dedicated lines for more than 80 components

line cleaning after each dosing





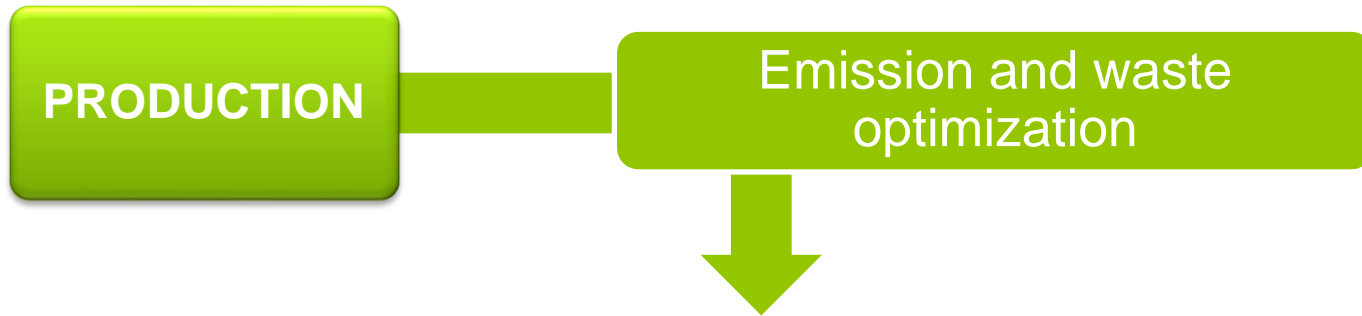
automated dosing optimized by dual measure

multiple-size, gauge-tunable supply valves (accuracy better than 10g per dosing)

dispersion optimized via rheological feedback control (energy use optimization)

identical batches from 100 Kg to 2 tons





closed circuit can/drum/IBC filling



no emissions or contamination from the environment

advanced double closed circuit cleaning station

solvent-recycling vat cleaning process





PRODUCTION

IVM engineering/production team achievements

Efficiency and Flexibility

initial capacity 2000 ton/year

- 3 movable vats for most formulations
- 1 disperser station for pastes and putties

modularly extensible

tied into the plant cryogenic vapor trap system



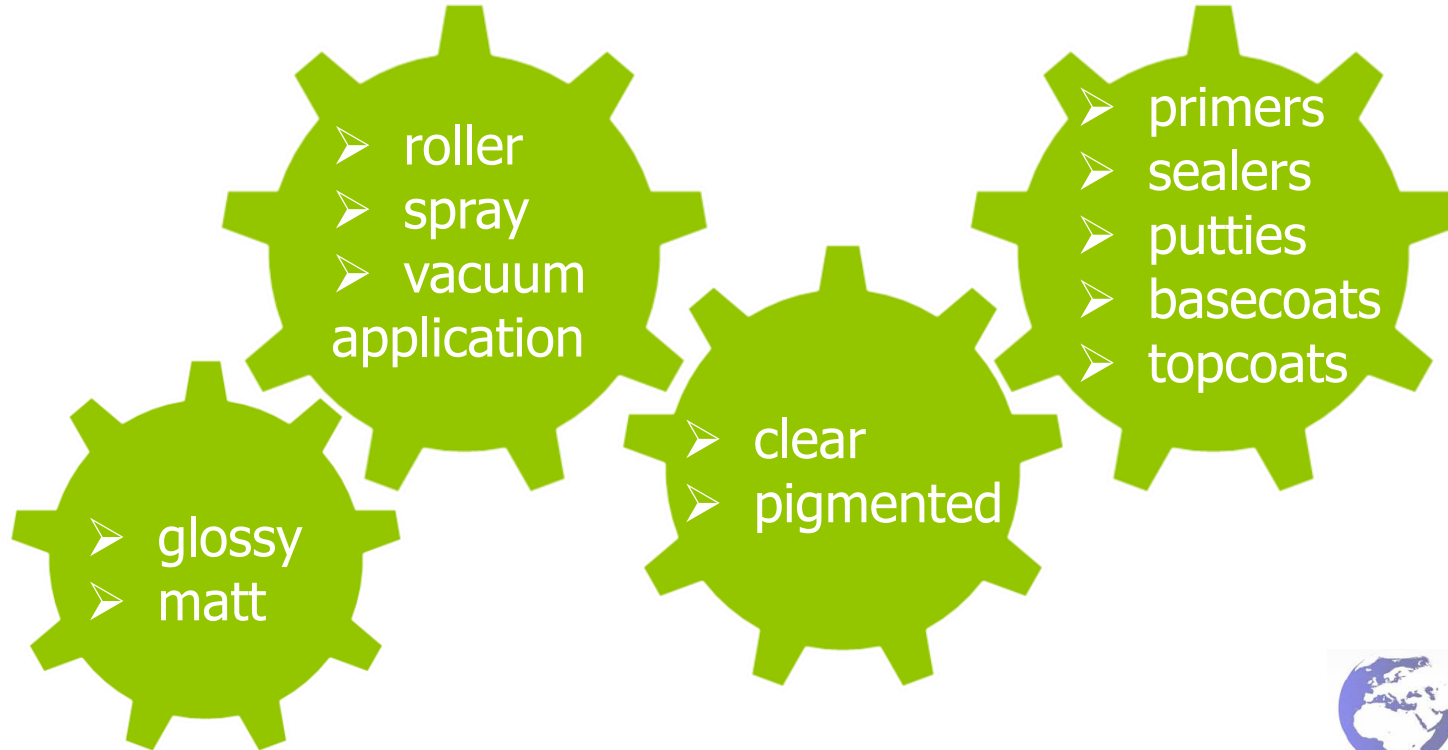


LIFE-BioPaint Prototypes



Many possible applications

The new pilot plant can produce any biobased UV coating product better than any other existing plant





LIFE-BioPaint products can be certified



... and many more!





Applications enabled by **LIFE-BioPaint** products

LED curing

Excimer curing

Embossed surfaces

3D printing





Biorenewable products are already available!

Full range of 100% UV coatings, 70% bio, roller application

clear primer
clear heavy putty for closed grain
clear sandable sealers for open or closed grain
clear top coats, from 5 to 70 sheen

Excellent leveling
and
physical and chemical resistance

Open or closed grain cycles with excellent aesthetic quality, for furniture, doors, panels and flooring
(“high foot traffic”
classification according to UNI 11622: 2016)





Biorenewable products are already available!

100% UV oils
for roller applications

clear matt oil, 94% bio, 3 sheen

clear matt oil, 32% bio,
stainable, 3 sheen

Bio-sourced
and
far superior for
chemical and
physical resistance
to oils
not UV-cured





LIFE-BioPaint

Environmental results





QUESTIONS?

For any info: ***m.vitale @ivmchemicals.com***

