State Regional Development Agency Republic of Latvia

LIFE ALFIO

TECHNICAL SPECIFICATIONS OF 16 FORMULATION

VERSION: FINAL

PROJECT "ALINA LIFE FORMULATIONS IN OPEN-SOURCE PLATFORM"

LIFE17 ENV/LV/000318

ALINA

UNIVERSITY OF LATVIA

1862 RIGA TECHNICAL UNIVERSITY

Contents

Background information

The aim of the document is to develop detailed formulation technical specification in accordance to Ecolabel requirements (regulation 2014/312/ES), industry needs and future regulatory tendencies to achieve the project objective - to reduce the impact of toxic chemicals on the environment and human health by reducing toxic biocides and VOCs in paint and coating formulations with a safe, sustainable and novel organoclay-based material

Scope of technical specifications

Scope of technical specifications are formulated from the obtained results of project LIFE ALFIO action A.1: Potential costumers' and stakeholder in-depth qualitative survey.

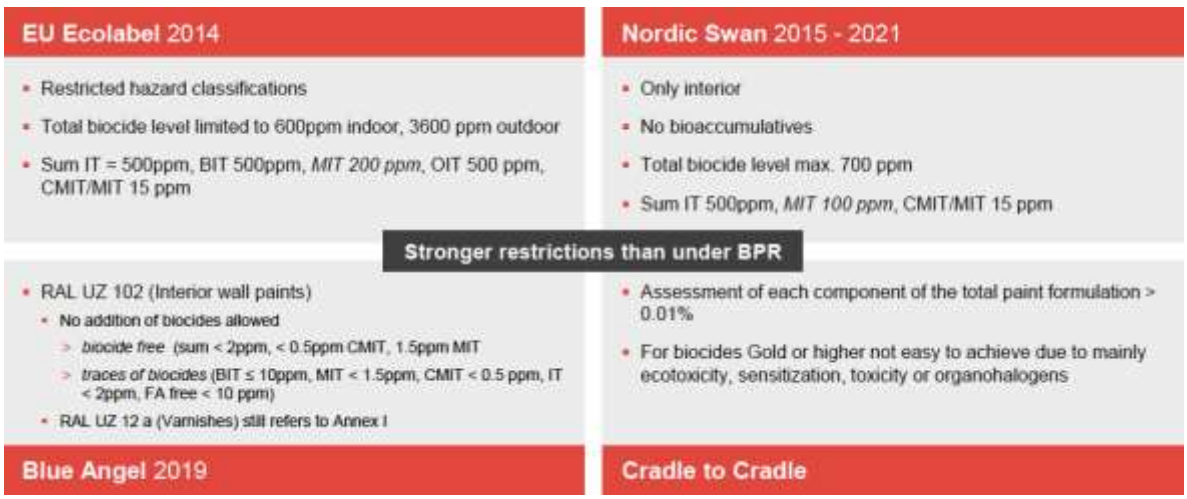
Ecolabels and regulation

Sustainable, human health and environment friendly paint and coating product development is very much dependant on a raw material supplier, as binders and pigments.

Additionally, to strict biocidal product regulation, Blue Angel ecolabel as well requires avoidance of substances that are damaging to health and the environment e.g. via

- Stringent limits on heavy metals
- Excluding alkylphenol ethoxylates (APEO), as well as perfluorinated and polyfluorinated chemicals (PFC)
- Strict regulation of softening agents (phthalates and organophosphates)
- Strict limits on isothiazolinones and formaldehyde

Raw material suppliers (a specially Binder manufacturers) are the driving source to accelerate sustainable paint and coating product development. They keep the knowledge and recourses to design and innovate, where paint and coating manufacturers are more like users.



VOC for interior products

Demanding limits on volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC)

Reduction of VOC for Low-Emission Interior Paints apply for emulsion paints, silicate emulsion paints and primers for wall paints that are intended for use as interior wall and ceiling paints.

Paint and Coating product manufacturers are very much dependant from a raw material used. VOC emissions are mainly driven by the use of specific binder (constitute 30+%).

Binder development is an extensive and complex R&D process, which requires compatibility with other raw materials and suitability for specific paint and coating product application.

Bio Based paint and coating market

The development of "green" products currently features across the paints and coatings industry. "The industry is working on solutions to further cut down on the use of hazardous and, in some cases, toxic chemicals"

Demand for bio-based coatings is on the rise. Volumes of bio-based solvents are following a similar upward trajectory. The most important or largest outlet for bio-based solvents is paints, surface coatings and printing inks, with a 40% share.

Market Vendors: The Freshaire Choice, EcoProCote, BASF SE, BioShields, Auro Pflanzenchemie AG, Bio Brands LLC, Mythic Paint, BioAmber Inc, Benjamin Moore Co. and Cargill Incorporated

System behind paint market

Binder companies design and manufacture binders, for different paint product use cases. In a paint manufacturing supply chain, they play the leading role. Binder manufacturers define material and potential paint systems that can be manufactured.

Smaller paint and coating manufacturers are dependent from distributers, that accumulated limited competence inhouse. They do consult and sell limited range of products for they clients. In some extreme cases they become source of information for the paint and coating manufacturer.

Raw material suppliers, distributors, formulators and biocide producers are important stakeholders in the market. They keep information flow and have substantial effect on a new paint product development.

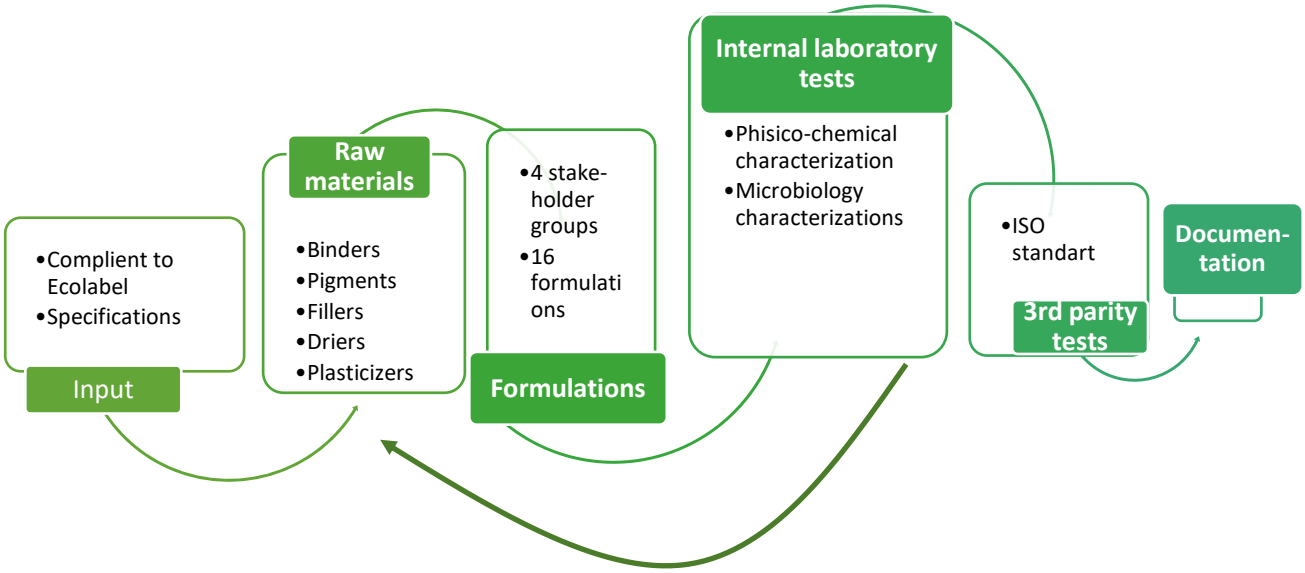
16 formulation development specification strategy focus

1. Ecolabel/ Blue Angel/ Swan new certification standard compliance
2. Paint manufacturer focus
3. Binder manufacturer focus
4. Regional material suppliers

Formulation development process and testing deal flow

Key activities of new formulation development process

Formulation development process and testing flow



Key steps of formulation selection

1. Product type – define paint & binder manufacturer

- Paint - interior paint;
- Paint – exterior paint;
- Varnish;
- Wood stain;
- Coating - industrial application;
- Coating - decorative application;
- Masonry coatings;
- Others.

2. Technology – define paint manufacturer

- Waterborne;
- Oil based;
- Bio-based;
- Solvent-borne

3. For which surface – define paint manufacturer

- For wood - furniture, moulds, home decoration;
- For concrete - floors, walls, buildings;
- For gypsum - walls, finishing;

4. What are the characteristics – define paint manufacturer

- Interior work - great opportunities to choose a binder;

- Exterior;
- VOC objectives - environmental problems or regulations;
- Film-forming;
- Pigmented (white, light coloured, coloured);
- Transparent or semi-transparent;
- Glossy or matte - types of matching agents of matting agents;
- Mid sheen paints (semi-gloss, satin, semi matt);
- Smooth or textured coating;
- Air drying or dyer caused polymerisation.

5. Application methods – define paint manufacturer

- Brush;
- Rollers;
- Airless sprayer;
- Aerosols;
- Immersion;
- Sponge.

Raw material selection criteria

Compliance to EU Ecolabel certification standard:

- White pigment and wet scrub resistance compliance;
- Titanium dioxide compliance;
- Efficiency in use compliance;
- Volatile and Semi-volatile Organic Compounds (VOCs, SVOCs) compliance;
- Formaldehyde compliance;
- Compliance documentation towards use of hazardous substances and mixtures;
- Documented guidelines towards consumer information and information appearing on the EU Ecolabel, see Attachment 1.

Paint formulation validation internal testing methods

Physically chemical characterization

Viscosity	Method applied: Rotational viscosimeter, MPa Brookfield CAP 1000+ viscometer, cP
Sedimentation	Method applied: visual sedimentation evaluation in time
Drying time	Method applied: Set-To-Touch Time; Dust-Free Times; Tack-Free Times
Thickness of application	Method applied: magnetic thickness measurements; optical microscopy; profilometry; (depends on the substrate nature)
Wet scrub resistance	EN13300 (Method EN ISO 11998)
Gloss, Matt (60o)	Glossmeter- Rhopint Novogloss

Density	ISO 2811
Solid content	EN ISO 3251
Spreading rate	ISO 6504/1; ISO 6504/3
Determination of phase composition (suitable for characterization of raw materials, finished organoclay) + identification	Method applied: X-ray powder diffraction
Phase transitions (degradation / thermal / stability studies)	Method applied: Differential Scanning Calorimetry / Thermal Gravimetric Analysis
Determination of the sorption capacity (applicable to raw clay materials)	Method applied: determination of clay sorption ability by methylene blue method
VOCs, semi-VOCs	Method applied: gas chromatography ISO 11890-2, ISO 17895.
Formaldehyde	ISO 16000

Microbiological characterization

Measurement of pH	Method applied: Thor Test Method 625
Screening for Microbial Contamination	Method applied: Thor Test Method 700
Wet State Bacterial Resistance Test	Method applied: Thor Test Method 720
Wet State Yeast Resistance Test	Method applied: Thor Test Method 740
Wet State Fungal Resistance Test	Method applied: Thor Test Method 730
Dry Film Fungal Resistance Test	Method applied: Thor Test Method 800.1
Methods of test for paints. Part G6: Assessment of resistance to fungal growth	Method applied: BS 3900-G6 modification
Resistance of emulsion paints in the container to attack by microorganisms (INCAN)	Method applied: ASTM D 2574-06 modification

Microbiological testing methods

Measurement of pH: Thor Test Method 625

Screening for Microbial Contamination: Thor Test Method 700

Appropriate growth media are streak inoculated with aliquots of each sample for the detection of aerobic bacteria, molds and yeast. After incubation for a minimum of 24 hours at an appropriate temperature any microbiological growth is visually assessed using the rating scale detailed in the results table.

Wet State Bacterial Resistance Test: Thor Test Method 720

Aliquots of each test sample are prepared and inoculated on a number of occasions at weekly intervals as detailed in the results table. The inoculum is a defined suspension of bacteria relevant in practice. The test samples are incubated under defined conditions. At specified intervals after each inoculation, as indicated in the results table, bacterial growth, where present, is determined by thoroughly mixing the sample and streak inoculating onto appropriate agar plates. These are assessed for growth after incubation under specified conditions according to the rating scale.

Micro-organisms used: *Aeromonas hydrophila; Proteus vulgaris; Alcaligenes faecalis; Providencia rettgeri; Cellulomonas flavigena; Pseudomonas aeruginosa; Corynebacterium ammoniagenes; Pseudomonas fluorescens; Enterobacter aerogenenes; Pseudomonas putida; Escherichia coli; Pseudomonas stutzeri; Klebsiella pneumoniae; Serratia liquefaciens/Grimes II*

Wet State Yeast Resistance Test: Thor Test Method 740

Aliquots of each test sample are inoculated on a number of occasions at weekly intervals as detailed in the results tables. The inoculum is a suspension of yeasts relevant in practice. The test samples are incubated under appropriate conditions.

At specified intervals after each inoculation, indicated in the results table, yeast growth, where present, is detected by thoroughly mixing of the sample and streak inoculation onto appropriate agar plates. These were assessed for growth after incubation under specified conditions according to the rating scale.

Micro-organisms used: *Candida valida; Rhodotorula rubra; Saccharomyces cerevisiae*

Wet State Fungal Resistance Test: Thor Test Method 730

Aliquots of each test sample were prepared and were surface inoculated with a defined suspension of fungi relevant in practice. The surface inoculated samples are incubated under ideal fungal growth conditions and any resulting surface fungal growth is visually assessed according to the rating scale described in the results table. Where no surface growth is visible the presence viable fungal spores may be determined by thoroughly mixing the sample and streak inoculating onto appropriate agar plates. These are assessed for the growth or no growth after incubation under specified conditions.

Micro-organisms used: *Aspergillus oryzae; Paecilomyces variotii*; *Cladosporium cladosporoides; Penicillium ochrochloron*; *Geotrichum candidum*

Dry Film Fungal Resistance Test – Humidity Cabinet: Thor Test Method 800.1

Each sample is painted onto a substrate closely simulating that used in practice. A defined mixed spore suspension prepared from fungi (including yeasts) relevant in practice is spray inoculated onto the dry film surfaces. The "panels" are allowed to dry before they are suspended in a high humidity cabinet for four weeks under specified conditions favourable for fungal growth. The resultant fungal growth on the surface is assessed visually and microscopically.

Microorganisms used: *Alternaria alternate; Phoma violaceae; Aspergillus versicolor; Rhodotorula rubra; Aureobasidium pullulans; Sporobolomyces roseus; Cladosporium cladosporoides; Stachybotrys chartarum; Penicillium purpurogenum; Ulocladium atrum*

„BS 3900-G6. Methods of test for paints. Part G6: Assessment of resistance to fungal growth" method modification

A suspension of a mixture of 7 microscopic fungi and 3 bacteria was applied and spread on a wooden surface.

Micro-organisms used: *Aspergillus versicolor* MSCL 1346, *Aureobasidium* sp. MSCL 1523, *Cladosporium cladosporioides* MSCL 276, *Penicillium roseopurpureum* MSCL 1287, *Rhodotorula mucilaginosa* MSCL 1448, *Stachybotrys chartarum* MSCL 1358, *Alternaria tenuis* MSCL 280, *Pseudomonas putida* MSCL, *Staphylococcus aureus* MSCL, *Pseudomonas aeruginosa* MSCL 332.

ASTM D 2574-06 *„Resistance of emulsion paints in the container to attack by microorganisms"* (INCAN) method modification.

A mixture of 12 microorganisms was used:

1) Fungi: *Alternaria tenuis* MSCL 280, *Cladosporium herbarum* MSCL 258, *Penicillium spinulosum* MSCL 1145, *Aspergillus niger* MSCL 324, *Candida albicans* MSCL 378, *Saccharomyces cerevisiae* MSCL 564;
2) Bacteria: *Pseudomonas putida* MSCL 650, *Pseudomonas aeruginosa* MSCL 331, *Staphylococcus aureus* MSCL 334;
3) Yeast: *Candida albicans* MSCL 378, *Rhodotorula mucilaginosa* MSCL 1448, *Saccharomyces cerevisiae* MSCL 564.

EN 15458 Algal Resistance "*Paints and varnishes - Laboratory method for testing the efficacy of film preservatives in a coating against algae*".

3rd parity ISO testing specification

Competent Bodies recognize tests which are accredited according to ISO 17025, and verifications performed by bodies which are accredited under the EN 45011 standard or an equivalent international standard.

Characterization of the finished product formulation in accordance to EU Ecolabel certification standard:

- White pigment and wet scrub resistance (EN 13300 using method EN ISO 11998);
- Data of titanium dioxide content, calculations of emissions;
- Efficiency in use

  Spreading rate, for white and light-coloured paints only (ISO 6504/1);

  Weathering (EN 11507 / EN 927-6) for outdoor applications only;

  Water vapour permeability (EN 1062-3) for outdoor applications only;

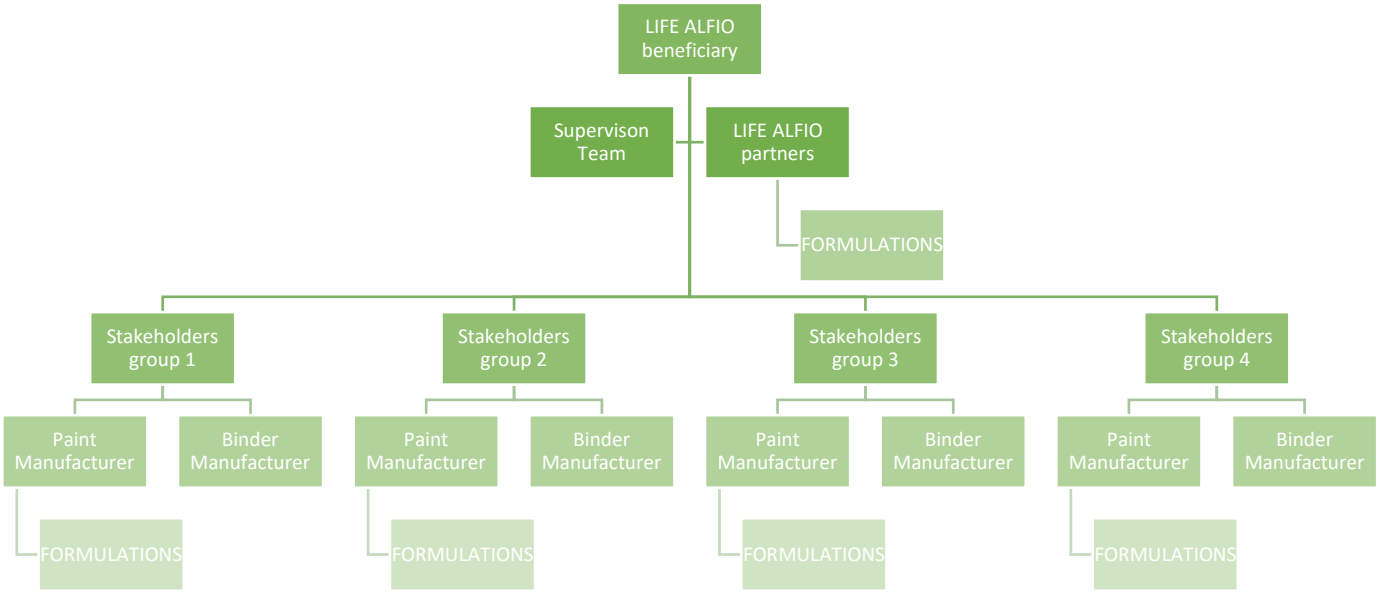
  Fungal resistance (EN 15457);

  Algal resistance (EN 15458);
- Volatile and Semi-volatile Organic Compounds (VOCs, SVOCs) (ISO 11890, ISO 17895);
- Formaldehyde (ISO 16000)
- Mineral raw materials including fillers (DIN 53770-1)
- Identification of hazardous substances and mixtures in finished formulation, risk/hazard classifications of all the ingredients and final paint.

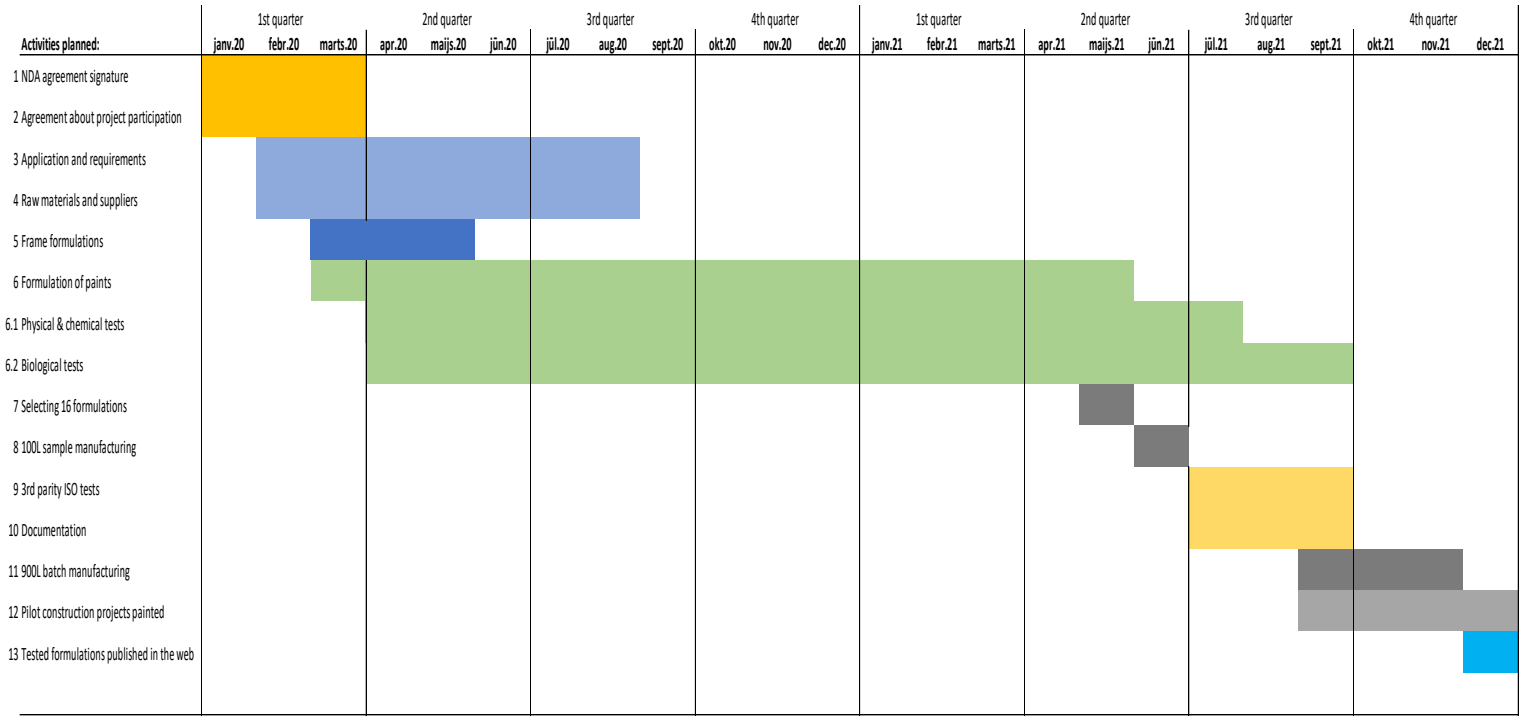
LIFE-ALFIO Project Stakeholders

Structure of stakeholder's co-creation

After finishing A.1 it was obvious to invite industry stakeholders to take active involvement of 16 formulation development. The co-creation structure is illustrated below Each participant will make a personal contribution in development of 16 formulations.



Formulation development activities



Formulations of Stakeholders group 1

Formulation No 1 (A) Interior wall paint based on non-ionic vinyl-acrylic copolymer binder (A – base).

Formulation No 2 (A) Interior wall paint based on non-ionic vinyl-acrylic copolymer binder (C – base).

Formulation No 3 (B) Interior paint for ceilings, based on aqueous dispersion of anionic acrylic copolymer.

Additional formulation No Ad1 (C) Interior waterborne low VOC's paints for walls based on anionic acrylic copolymer binder, without zero of biocides (A – base).

Additional formulation No Ad2 (C) Interior waterborne low VOC's paints for walls based on anionic acrylic copolymer binder, without addition of biocides (C – base).

Additional formulation No Ad3 (C) Interior waterborne low VOC's paints for ceiling based on anionic acrylic copolymer binder, without addition of biocides.

Formulations of Stakeholders group 2

Formulation No 4 Interior waterborne wall paint < CPVC, based on vinyl-acrylic copolymer binder with initial additive of 45 ppm CIT.

Additional formulation No Ad4 () Exterior wood stain, based on acrylic emulsion binder with addition of standard package biocide, to be destroyed during paint production.

Formulations of Stakeholders group 3

Formulation No 5 Silicate interior wall paint based on low VOC styrene acrylic binder (A - base).

Formulation No 6 Silicate interior wall paint based on low VOC styrene acrylic binder (C – base).

Formulations of Stakeholders group 4

Formulation No 7 Interior wood paint, based on linseed oil and non-ionic vinyl-acrylic copolymer binder mix (A – base).

Formulation No 8 Interior wood paint, based on linseed oil and non-ionic vinyl-acrylic copolymer binder mix (C – base).

Formulations of Project Partners

Formulation No 9 (R) Interior wood paint based on acrylic copolymer binder (A - base)

Formulation No 10 (R) Interior wood paint based on acrylic copolymer binder (C – base)

Formulation No 11 (F) Interior wood trim paint based on cationic acrylate copolymer binder (A – base).

Formulation No 12 (F) Interior wood trim paint based on cationic acrylate copolymer binder (C – base).

Formulation No 13 (K) Interior waterborne wall paint based on styrene-acrylic copolymer binder.

Formulation No 14 (W) Interior waterborne wall paint based on straight acrylic copolymer binder (A – base).

Formulation No 15 (Y) Interior waterborne wall paint based on styrene-acrylic copolymer binder (A – base).

Formulation No 16 (Y) Interior waterborne wall paint based on styrene-acrylic copolymer binder (C – base).

Additional formulation No Ad5 (W) Interior waterborne wall paint based on straight acrylic copolymer binder (C – base).

Additional formulation No Ad6 (AB) Interior waterborne wall paint based on acrylic dispersion with bio-renewable content 48% on solids (A -base).

Additional formulation No Ad7 (AB) Interior waterborne wall paint based on acrylic dispersion with bio-renewable content 48% on solids (C -base).

Additional formulation No Ad9 (CD) Interior waterborne wall paint based on straight acrylic copolymer binder (A – base).

Additional formulation No Ad10 (CD) Interior waterborne wall paint based on straight acrylic copolymer binder (C – base).

Attachment 1

Product group criteria	**Paints and Varnishes (with their subcategories identified according to the Directive 2004/CE/42)**			
	indoor paint	**outdoor paint**	**varnish or woodstain**	**NOTEs**
White pigment	Indoor wall and ceiling paints for which Class 1 and 2 wet scrub resistance claims are made, shall have a white pigment content (white inorganic pigments with a refractive index higher than 1,8) per ml of dry film, equal to or lower than that described in Table 1, with 98% opacity. For all other paints, including limed paints, silicate paints, primers, anti-rust paints and facade paints, the white pigment content (white inorganic pigments with a refractive index higher than 1,8) shall not exceed 36g/m2 for indoor products and 38g/m² for outdoor products. In the case of paints for both indoor and outdoor use, the more stringent limit shall apply. In case the above mentioned products fall under the exemption indicated in part (b) below, then the white pigment content (white inorganic pigments with a refractive index higher than 1,8) shall not exceed 25 g/ml of dry film, with 98% opacity.			The applicant shall provide a test report according to EN 13300 using the method EN ISO 11998 (test for cleanability and scrub resistance). For ceiling paints and indoor wall paints, the labelling for the packaging (including the accompanying text) shall be provided as evidence regarding claims of wet scrub resistance.
Wet scrub resistance	All indoor wall and ceiling paints (finishes) shall achieve class 1 or class 2 in wet scrub resistance (WSR) according to EN 13300 and EN ISO 11998. This requirement only applies to tinting bases (base paints). Exempted from this requirement are indoor wall and ceiling paints with a white pigment content (white inorganic pigments with a refractive index higher than 1,8) that is equal or lower to 25g/ml of dry film, with 98 % opacity.			

Titanium dioxide	If the product contains more than 3.0% w/w of titanium dioxide, the emissions and discharges of wastes from the production of any titanium dioxide pigment used shall not exceed the following: For the sulphate process: • SOx calculated as SO_2: 7.0 kg /tonne TiO_2 pigment • Sulphate waste: 500 kg /tonne TiO_2 pigment. For the chloride process: • If natural rutile ore is used, 103 kg chloride waste /tonne TiO_2 pigment • If synthetic rutile ore is used, 179 kg chloride waste /tonne TiO_2 pigment • If slag ore is used, 329 kg chloride waste /tonne TiO_2 pigment. If more than one type of ore is used, the values will apply in proportion to the quantity of the individual ore types used.	The applicant shall submit supporting documentation showing compliance by the titanium dioxide producer manufacturing the raw material for the paint product. This can be either in the form of a declaration of non-use, or a declaration supported by data indicating that the respective levels of process emissions and waste discharges of wastes are met.

Efficiency in use				
3(a) Spreading rate (only for white and light coloured paints, including the white base paints used in tinting systems) — ISO 6504/1	8 m2/L	4 m2/L (elastomeric paint) 6 m2/L masonry paint)		Not applicable to varnishes, lasures, transparent adhesion primers or any other transparent coatings. This criterion only applies to white or light coloured paint.

3(b) Resistance to water – ISO 2812-3			Resistant to water	All varnishes, floor coatings and floor paints shall have resistance to water, as determined by ISO 2812-3 such that after 24 hours' exposure and 16 hours' recovery no change of gloss or of colour occurs.
3(c)Adhesion – EN 24624				
3(d) Abrasion – EN ISO 7784-2				
3(e) Weathering – EN 11507 / EN 927-6		1000 h	1000 h (outdoor)	The applicant shall provide test reports using either ISO 11507 according to the specified parameters or EN 927-6, or both. The applicant shall provide test reports using EN ISO 4628-2, 4, 5, 6 and a test report in conformance ISO 7724-3 where applicable. Masonry finish paints and wood and metal finishes including varnishes shall be exposed to artificial weathering in apparatus including fluorescent UV lamps and condensation or water spray according to ISO 11507. They shall be exposed to test conditions for 1000 hours. Test conditions are: UVA 4h/60 °C + humidity 4h/50 °C. Alternatively, outdoor wood finishes and wood varnishes shall be exposed to weathering for 1000 hours in the QUV accelerated weathering apparatus with cyclical exposure with UV(A) radiation and spraying according to EN 927-6. According to ISO 7724 3, the colour change of samples exposed to weathering shall not be greater than ΔE * = 4. It is not applicable to varnishes and bases. Decrease of gloss for gloss paints and varnishes exposed to weathering shall not be greater than 30% of its initial value and shall be measured using ISO 2813. This requirement is not applicable to mid sheen and matt-finishes7 which have an initial gloss value less than 60% at 60° angle of incidence. Chalking shall be tested using method EN ISO 4628-6:2007 on masonry finish coats and wood and metal finishes (where applicable) after the samples have been exposed to weathering. Coatings shall score of 1,5 or better (0,5 or 1,0) in this test. In the standard there are illustrated references.The following parameters shall also be evaluated on masonry finish coats and wood and

				metal finishes after the samples have been exposed to weathering: •Flaking according to ISO 4628-5; flake density 2 or less, flake size 2 or less; • Cracking acco rding to ISO 4628-4; crack quantity 2 or less, crack size 3 or less; •Blistering accor ding to ISO 4628-2; blister density 3 or less, blister size 3 or less.
3(f) Water vapour permeability – EN ISO 7783		Class II or better	Class II or better (outdoor)	The applicant shall provide a test report using methodology EN ISO 7783 and classification according EN 1062-1. Where claims are made that exterior masonry and concrete paints are breathable the paint shall be classified according to EN1062-1 as class II (medium vapour permeability) or better according to the test method EN ISO 7783.
3(g) Liquid water permeability – EN 1062-3		Where claims are made Class III. All other products Class II or better		Class III water permeability requirements within EN 1062-1 are W≤0.1. Class II water permeability requirements within EN 1062-1 are W≤0.5
3(h) Fungal resistance – EN 15457		Class I or lower (masonry or wood paints)	Class I or lower (outdoor)	Where claims are made that exterior masonry finish and wood paints have anti-fungal and algal properties, and in accordance with PT7 of the Biocide Regulation (EC) No 528/2012, the following requirements shall be determined using EN 15457 and EN 15458. Masonry paints shall have a score of class 1 or lower (1 or 0) for fungal resistance (i.e. less than 10 % fungal coverage) and a score of class 1 or lower for algal resistance. Wood paints shall have a score of 0 for fungal resistance and 0 for algal resistance.
3(h) Algal resistance - EN 15458		Class I or lower (masonry or wood paints)	Class I or lower (outdoor)	
3(i) Crack bridging – EN 1062-7		A1 (elastomeric paint only)		Where claims are made that masonry (or concrete) paint has elastomeric properties, the paint shall at least be classified as A1 at 23°C according to EN 1062-7.

<table>
<tr><td>3(j) Alkali resistance – ISO 2812-4</td><td></td><td>Masonry paint</td><td></td><td>Masonry paints and primers shall show no noticeable damage when the coating is spotted for 24 hours with 10% NaOH solution according to method ISO 2812-4. The evaluation is done after 24 hours drying-recovery.</td></tr>
<tr><td>3(k) Corrosion resistance – EN ISO 12944-2 and 12944-6, ISO 9227, ISO 4628-2 and 4628-3</td><td colspan="3"></td><td></td></tr>
<tr><td>Volatile and Semi-volatile Organic Compounds (VOCs, SVOCs)</td><td colspan="3"><table>
<tr><th>Product description (with subcategory denotation according to Directive 2004/CE/42)</th><th>VOC limits (g/L including water)</th><th>SVOC limits (g/L including water)</th></tr>
<tr><td>a. Interior matt walls and ceilings (Gloss <25@60°)</td><td>10</td><td>30[1]/40[2]</td></tr>
<tr><td>b. Interior glossy walls and ceilings (Gloss >25@60°)</td><td>40</td><td>30[1]/40[2]</td></tr>
<tr><td>c. Exterior walls of mineral substrate</td><td>25</td><td>40</td></tr>
<tr><td>d. Interior/Exterior trim and cladding paints for wood and metal</td><td>80</td><td>50[1]/60[2]</td></tr>
<tr><td>e. Interior trim varnishes and woodstains, including opaque woodstains</td><td>65</td><td>30</td></tr>
<tr><td>e. Exterior trim varnishes and woodstains, including opaque woodstains</td><td>75</td><td>60</td></tr>
<tr><td>f. Interior and Exterior minimal build woodstains</td><td>50</td><td>30[1]/40[2]</td></tr>
</table></td><td>The content of VOCs and SVOCs shall be determined for the ready to use product and shall include any recommended additions prior to application such as colourants and/or thinners.Products with a VOC content that is in accordance with the limits in Table 3 may display the text ‘reduced VOC content’ and the VOC content in g/l next to the Ecolabel. The stricter VOC limit value for indoor paints shall be used where products are designed for both indoor and outdoor use.
Where the SVOC content is to be determined by calculation, and data for the calculation cannot in all cases be obtained from raw material suppliers or other reliable sources, then these ingredients and raw materials shall be treated as SVOCs for the purpose of the calculation, thereby representing a 'worst case scenario'. For the VOC content of the ready to use product, the applicant shall provide either a test report using the methods given in ISO 11890-2 or ISO 17895 that demonstrates compliance; or a declaration of compliance supported by calculations based on the paint ingredients and raw materials. For the SVOC content of the ready to use product, the applicant shall provide either a test report using the method given in ISO 11890-2; or a declaration of compliance supported by calculations based on the paint ingredients and raw masterials. The test shall be carried out using the analytical system as identified in the guidance given below. At the request of a Competent Body applicants may be required to validate calculations using the specified test method.</td></tr>
</table>

Restriction of hazardous substances and mixtures	Evidence of compliance with this criterion includes the applicant and their suppliers providing the CAS numbers and risk/hazard classifications of all the ingredients and final paint. This information may be contained in the Safety Data Sheets.
(a) Overall restrictions that apply to hazard classifications and risk phrases	The final product formulation, including all intentionally added ingredients present at a concentration of greater than 0,010 %, shall not, unless expressly derogated in Appendix 1, contain substances or mixtures classified as toxic, hazardous to the environment, respiratory or skin sensitisers, or carcinogenic, mutagenic or toxic for reproduction in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council8 or Council Directive 67/548/EC129 and as interpreted according to the hazard statements and risk phrases listed in Table 5.
(b) Restrictions that apply to Substances of Very High Concern	In accordance with Article 6(7) of Regulation (EC) No 66/2010 the final product and any ingredients or raw materials, shall not, unless specifically derogated, contain substances that: • Meet the criteria in Article 57 of the REACH Regulation; • Have been identified according to the procedure described in Article 59(1) of the REACH Regulation which establishes the Candidate List for Substances of Very High Concern. No derogation shall be given concerning substances that meet one or both of these conditions, and which are present in a paint or varnish product at concentrations higher than 0.10 % (weight by weight).

(c) Restrictions that apply to specific hazardous substances	The final product shall not contain the hazardous substances that are specifically identified in Appendix 1 at or above the specified concentration limits. The restrictions on substances in Appendix 1 apply to the following paint and varnish ingredients and residues: (i) Dry film preservatives (ii) Tinting machine preservatives (iii) In-can preservatives (iv) Preservative stabilisers (v) Alkylphenolethoxylates (APEOs) surfactants (vi) Perfluorinated surfactants (vii) Metals and their compounds (viii) Pigments (ix) Plasticisers (x) Free formaldehyde

Attachment 2 MSDS

PRODUCT SAFETY DATA SHEET /

DETAILS OF THE CHEMICAL OR PRODUCT

in accordance with Regulations (EC) No 830/2015 of the European Parliament and of the Council of 20.05.2010 and No 1907/2006 of 18.12.2006

Product name: **PAINT**

Date of issue:	28.02.2020.	Recent changes carried out:
Version:		

1. IDENTIFICATION OF MIXTURE AND COMPANY

1.1. Product name:

Trade name: **XXXXXX**

1.2. Recommended use or undesirable use:

1.3. Manufacturer: **"XXXXXXXXX"**

Manufacturer's address:

Tel.:

email:

Information where necessary:

1.4. Call in an emergency:

National Fire and Rescue Service: 112

For ambulance: 03 or 113

Poisoning and Drug Information Centre +37167042473

Toxicology Centre phones:

+371-67042468 (daily)

2. HAZARD IDENTIFICATION

2.1. Classification of a substance or mixture

Classification of the mixture

Classification according to the EC for Regulation No 1272/2008:

2.2. Label Elements

Hazard pictogram:
Signal name:
Hazard statements:
Safety Requirements Labels:

2.3. Other hazards

3. COMPONENT DETAILS

3.1. Brief product characteristics: Mixture

3.2. The mixture shall consist of the following:

Name of the substance	CAS No.	EC No.	REACH registration number	Classification 1272/2008/EC (CLP)	By wight,%

4. FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation

Skin contact

Eye contact

Ingestion

4.2. Major symptoms and effects – acute and delayed:

4.3. Indication of the necessary emergency medical treatment and special care:

5. FIRE FIGHTING ACTIVITIES

5.1. Recommended fire-fighting agents:

Appropriate Deletion Features

Inappropriate Deletion Features

5.2. Specific hazards arising from a substance or mixture

Special hazard during fire:

5.3. Special indications for firefighters:

Additional information

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal protective measures, protective equipment and emergency procedures:

6.2. Environmental protection:

Precautions:

6.3. Collection methods:

Cleaning methods

6.4. References to other sections

Other information

7. HANDLING AND STORAGE

7.1. Precautions for safe use

Use

7.2. Storage. Safe storage requirements and conditions to be avoided

Storage

7.3. Nature of use:

Usage specificity

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters:

Other information on limit values

DNEL/PNEC

8.2. Exposure control

Effect on workplace limitation

8.3. Personal protective equipment of personnel:

Respiratory pathways

Hands

Eyes

Skin and body

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Outside appearance	
Color	According to the product specification
Scent	
Scent threshold	Not applicable
Melting point/interval	Not applicable
Boiling point/boiling range	Not applicable
Flash point	Not applicable
Evaporation rate	No data available
Vapour pressure	No data available
Relative Density	
Solubility in other solvents	
Water solubility	
Distribution factor: octanol/water	No data available
pH	

10. STABILITY AND REACTIVITY

10.1. Reactivity

10.2. Chemical stability

10.3. Possibility of hazardous reactions

10.4. Conditions to avoided

10.5. Materials to avoided

10.6. Hazardous degradation products

11. TOXICOLOGICAL INFORMATION

11.1.Information on toxicological effects

Acute toxicity (oral)

Acute dermal toxicity

Acute inhalative toxicity

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

Stem cell mutagenicity

Genotoxicity

Carcinogenicity

Teratogenicity

Stot - single exposure

Inhalation toxicity

Human exposure: skin contact

Human exposure of the product: barking

Human exposure of the product:

eye contact

12. ECOLOGICAL INFORMATION

12.1. Toxicity

12.2. Persistence and degradability

12.3.Bioaccumulation potential

12.4.Mobility in soil

12.5. Results of evaluations of PBT and vPvB

12.6. Other negative effects, and additional information

Component / Cas No.	Toxicity to Algae	Toxicity to Fish	Toxicity to Water Flea

13. DISPOSAL CONSIDERATIONS

13.1.Waste treatment methods

Product

Packaging

14. TRANSPORT INFORMATION

14.1. ANO No.

14.2. Suitable shipping name

ADR
RID
IMDG
IATA

14.3. Transport hazard class

14.4. Packing group

ADR
RID
IMDG
IATA

14.5. Environmental hazards

14.6.Special precautions for the user

14.7.Bulk transport according to the Marpol 73/78 and IBC Code of Annex II

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/regulatory enactments specifically relating to the substance or mixture

The safety data sheet was developed in accordance with Commission Regulations (EC) No 2015/830 and (EC) No 1907/2006.

The labelling and classification have been developed in accordance with Regulation (EC) No 1272/2008 of 16.12.2008 on the classification, labelling and packaging of substances and mixtures and amending Regulation (EC) No 1707/2006.

The management of hazardous waste is carried out in accordance with Commission Decision (EC) 2000/532 and Council Directive (EC) 91/689, as well as in accordance with the Law on Waste Management of 28.10.2010 and BOM Regulation No 484 (21.6.2011) "Procedures for the accounting, identification, storage, packaging, labelling and transport of hazardous waste".

In Latvia, the management of hazardous waste is carried out in accordance with the Law on Waste Management of 28.10.2010 and 16.12.2010 Amendments to the Waste Management Law, BOM Regulation No 484 (21.06.2011) "Procedures for the Accounting, Identification, Storage, Packaging, Labelling and Carriage of Hazardous Waste" and BOM Regulations No 302 (19.04.2011) "Rules on the classification of waste and the properties that make waste hazardous".

Transport information developed in accordance with the United Nations Europe Agreement on Transnational Carriage of Dangerous Goods by Road, applicable from 01.01.2011, in accordance with Annex 1 to Appendix B to the Convention on International Carriage by Rail (in force from 01.01.2011), according to the International Maritime Organisation, 2006. Annual expenditure, ISBN 978-92-2001-4214-3, IATA, 2007-2008. Annual expenditure.

The gathering of information takes into account the SG & A BOM Regulation No 325 (15.05.2007) labour protection requirements in contact with chemicals at work, Regulation (EC) No 2009/161 establishing a third list of indicative occupational exposure limit values and amending Commission Directive 2000/39/EC, Council Directive 98/24/EC of 7 April 1998 on "Work conditions" health and safety protection of chemicals at work., Regulation (EC) No 2037/2000 on substances that deplete the ozone layer, Regulation (EC) No 850/2004 on persistent organic pollutants, amending Directive 79/117/EEC.

15.2. Chemical safety assessment

16. OTHER INFORMATION

16.1. The hazard of the substance has not been specified elsewhere.

Abbreviations: *67/548/EEC = Hazardous Substances Directive. 1999/45/EC = Dangerous Preparations Directive.*

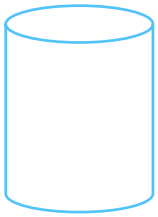
EC Regulation No 1272/2008 = Regulation on the classification, labelling and packaging of substances and mixtures.

IATA = International Air Transport Association. IMDG = International Maritime Dangerous Goods Code. RID = contract for the transport of dangerous goods by rail. ADR = European Treaty on the International Carriage of Dangerous Goods by Road. TWA = time-weighted average. STEL = Short term exposure limit value.

AER + Occupational Exposure Limit, h 8; LC50 — Average Lethargic Confusion; LD 50 - Average Lethargic Dose; EC 50 - Effective Concetration; N. p.d. - No data available; vPvB - Very Persistent, Very Bioaccumulative Chemicals; PBT-Free, Bioaccumulative Chemicals.

The information provided in this safety data sheet is based on the data provided by the product manufacturer which is considered to be correct. The information provided is intended solely to ensure safe handling, use, recasting, storage, transport, disposal, not as a quality guarantee or quality certificate, since the above-mentioned product activities are not under our responsibility. The information is limited to that product and in no case shall it apply to the product, to be used together with any other material.

Attachment 3 TDS



PRODUCT NAME

TECHNICAL DATA SHEET …….. 2021

PRODUCT DESCRIPTION

TECHNICAL DATA

Area of application

Binder

Volume Solids

Weight solids

Density

Viscosity ICI

Stormer viscosity

Gloss

Contrast ratio

Washability/ wet scrub resistance

Thinner/Cleaning

Material consumption

Temperature at painting

Tools for painting

Dust dry/ open time

Re-paintable

Completely dry

Color

VOC category

SVOC

Biocides

Formaldehydes

PVC

Composition

Disposal

Cleaning of tools:

Storage:

Storage stability:

HOW TO USE

Pre-painting:

Painting: