

Safety data sheet

Green Gold - 410

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Date / Revised: 13.09.2018
Product: Green Gold - 410

Version: 4.0

(ID no. 30129577/SDS_GEN_GB/EN)

Date of print 16.09.2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Green Gold - 410

Chemical name: [1-[[[(2-Hydroxyphenyl)imino]methyl]-2-naphtholato(2-)-N,O,O']copper
CAS Number: 15680-42-9

REACH registration number: 01-2120100829-57-0000

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: colouring component

For the detailed identified uses of the product see appendix of the safety data sheet.

1.3. Details of the supplier of the safety data sheet

Company:
Michael Harding Art Formulas Ltd
Unit K Springvale Ind Est
Cwmbran
Torfaen
NP44 5BE

Telephone: +44(0)1633484700
E-mail address: accounts@michaelharding.co.uk

1.4. Emergency telephone number

International emergency number:

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Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

According to Regulation (EC) No 1272/2008 [CLP]

Acute Tox. 4 (Inhalation - dust)

H332

For the classifications not written out in full in this section the full text can be found in section 16.

2.2. Label elements

Globally Harmonized System, EU (GHS)

Pictogram:



Signal Word:
Warning

Hazard Statement:
H332 Harmful if inhaled.

Precautionary Statements (Prevention):
P271 Use only outdoors or in a well-ventilated area.
P261 Avoid breathing dust.

Precautionary Statements (Response):
P312 Call a POISON CENTER or doctor/physician if you feel unwell.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

2.3. Other hazards

According to Regulation (EC) No 1272/2008 [CLP]

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

The product is under certain conditions capable of dust explosion.

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SECTION 3: Composition/Information on Ingredients

3.1. Substances

Chemical nature

[1-[[[2-Hydroxyphenyl]imino]methyl]-2-naphtholato(2-)-N,O,O']copper
CAS Number: 15680-42-9
EC-Number: 239-763-1

For the classifications not written out in full in this section, including the hazard classes and the hazard statements, the full text is listed in section 16.

3.2. Mixtures

Not applicable

SECTION 4: First-Aid Measures

4.1. Description of first aid measures

Remove contaminated clothing.

If inhaled:

If difficulties occur after dust has been inhaled, remove to fresh air and seek medical attention.

On skin contact:

Wash thoroughly with soap and water.

On contact with eyes:

Wash affected eyes for at least 15 minutes under running water with eyelids held open.

On ingestion:

Rinse mouth and then drink plenty of water.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms: No significant reaction of the human body to the product known.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

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SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media

Suitable extinguishing media:
dry powder, foam

Unsuitable extinguishing media for safety reasons:
carbon dioxide

Additional information:

Avoid whirling up the material/product because of the danger of dust explosion.

5.2. Special hazards arising from the substance or mixture

harmful vapours

Evolution of fumes/fog. The substances/groups of substances mentioned can be released in case of fire.

5.3. Advice for fire-fighters

Special protective equipment:

Wear a self-contained breathing apparatus.

Further information:

The degree of risk is governed by the burning substance and the fire conditions. Contaminated extinguishing water must be disposed of in accordance with official regulations.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Use personal protective clothing.

6.2. Environmental precautions

Contain contaminated water/firefighting water. Do not discharge into drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up

For small amounts: Pick up with suitable appliance and dispose of.

For large amounts: Contain with dust binding material and dispose of.

Avoid raising dust.

6.4. Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

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Breathing must be protected when large quantities are decanted without local exhaust ventilation.

Protection against fire and explosion:

Avoid dust formation. Take precautionary measures against static discharges.

Dust explosion class: Dust explosion class 2 (Kst-value 200 up to 300 bar m s⁻¹).

7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions: Keep container tightly closed and dry; store in a cool place.

7.3. Specific end use(s)

| See exposure scenario(s) in the attachment to this safety data sheet.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

PNEC

freshwater: 0.0155 mg/l

marine water: 0.00155 mg/l

intermittent release: 0.155 mg/l

STP: 100 mg/l

sediment (freshwater): 0.181 mg/kg

sediment (marine water): 0.0181 mg/kg

soil: 0.0271 mg/kg

oral (secondary poisoning):

No PNEC oral derived, as accumulation in organisms is not to be expected.

DNEL

worker:

Long-term exposure- systemic effects, Inhalation: 2.35 mg/m³

worker:

Long-term exposure- systemic effects, dermal: 3.3 mg/kg

consumer:

Long-term exposure- systemic effects, Inhalation: 0.58 mg/m³

consumer:

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Long-term exposure- systemic effects, dermal: 1.7 mg/kg

consumer:

Long-term exposure- systemic effects, oral: 0.17 mg/kg

8.2. Exposure controls

Personal protective equipment

Respiratory protection:

Suitable respiratory protection for lower concentrations or short-term effect: Particle filter with medium efficiency for solid and liquid particles (e.g. EN 143 or 149, Type P2 or FFP2)

Hand protection:

Chemical resistant protective gloves (EN 374)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

e.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), polyvinylchloride (0.7 mm) and other

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:

Safety glasses with side-shields (frame goggles) (e.g. EN 166)

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	powder
Colour:	greenish yellow
Odour:	odourless
Odour threshold:	not determined
pH value:	approx. 7
Melting point:	not soluble, (as suspension)
Boiling point:	> 300 °C
Flash point:	not determined
Evaporation rate:	not applicable
Flammability:	The product is a non-volatile solid.
Lower explosion limit:	not highly flammable
	not determined

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Upper explosion limit:	not determined	
Ignition temperature:	> 500 °C	(BAM)
Vapour pressure:		
Density:	not applicable 1.87 g/cm ³ (20 °C)	(Directive 92/69/EEC, A.3)
Relative density:		
Relative vapour density (air):	No data available.	
Solubility in water:	The product is a non-volatile solid. insoluble (20 °C)	
Solubility (quantitative) :	insoluble	
Partitioning coefficient n-octanol/water (log Kow):	Study does not need to be conducted.	
Self ignition:	not self-igniting	Test type: Spontaneous self- ignition at room-temperature.
	Temperature: > 250 °C	Test type: Self-ignition at high temperatures. (Method: VDI 2263, sheet 1, 1.4.1)
Thermal decomposition:	195 °C, 30 kJ/kg, (DSC (DIN 51007)) 370 °C, 20 kJ/kg, (DSC (DIN 51007)) 410 °C, 90 kJ/kg, (DSC (DIN 51007))	
Viscosity, dynamic:	Study does not need to be conducted.	
Explosion hazard:	not explosive	
Fire promoting properties:	not fire-propagating	

9.2. Other information

Bulk density:	approx. 1,600 kg/m ³	
Adsorption/water - soil:	KOC: 81.09; log KOC: 1.9 The product has not been tested. The statement has been derived from the structure of the product.	(calculated)
Grain size distribution:	No data available.	
Molar mass:	324.83 g/mol	

SECTION 10: Stability and Reactivity

10.1. Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

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Corrosion to metals: Corrosive effects to metal are not anticipated.
Formation of Remarks: Forms no flammable gases in the
flammable gases: presence of water.

10.2. Chemical stability

The product is stable if stored and handled as prescribed/indicated.

10.3. Possibility of hazardous reactions

Dust explosion hazard.

10.4. Conditions to avoid

Avoid electro-static discharge.

10.5. Incompatible materials

Substances to avoid:

No substances known that should be avoided.

10.6. Hazardous decomposition products

Hazardous decomposition products:

No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Virtually nontoxic after a single ingestion. Harmful by inhalation.

Experimental/calculated data:

LD50 rat (oral): > 5,000 mg/kg (similar to OECD guideline 401)

LC50 rat (by inhalation): >1 - <5 mg/L 4 h (OECD Guideline 403)

(dermal): No data available.

Irritation

Experimental/calculated data:

Skin corrosion/irritation rabbit: non-irritant (OPP 81-5 (EPA-Guideline))

Serious eye damage/irritation rabbit: non-irritant (OECD Guideline 405)

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Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

Guinea pig maximization test guinea pig: Non-sensitizing. (OECD Guideline 406)

Germ cell mutagenicity

Assessment of mutagenicity:

No mutagenic effect was found in various tests with bacteria and mammalian cell culture.

Carcinogenicity

Assessment of carcinogenicity:

No data available.

Reproductive toxicity

Assessment of reproduction toxicity:

The results of animal studies gave no indication of a fertility impairing effect. The results were determined in a Screening test (OECD 421/422).

Developmental toxicity

Assessment of teratogenicity:

No indications of a developmental toxic / teratogenic effect were seen in animal studies. The results were determined in a Screening test (OECD 421/422).

Specific target organ toxicity (single exposure)

Assessment of STOT single:

Apart from effects causing lethality, no specific target organ toxicity was observed in experimental studies.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies.

Aspiration hazard

not applicable

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:

Acutely harmful for aquatic organisms. Based on long-term (chronic) toxicity study data, the product is very likely not harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:

LC50 (96 h) > 100 mg/l, *Brachydanio rerio* (OECD 203; ISO 7346; 92/69/EEC, C.1, static)
No toxic effects occur within the range of solubility. The details of the toxic effect relate to the nominal concentration. Limit concentration test only (LIMIT test). No effects at the highest test concentration. The product has low solubility in the test medium. A saturated solution has been tested.

Aquatic invertebrates:

EC50 (48 h) > 100 mg/l, *Daphnia magna* (OECD Guideline 202, part 1, static)
The product has low solubility in the test medium. A saturated solution has been tested. The details of the toxic effect relate to the nominal concentration. No toxic effects occur within the range of solubility. Limit concentration test only (LIMIT test). No effects at the highest test concentration.

Aquatic plants:

EC50 (72 h) 15.5 mg/l (growth rate), *Pseudokirchneriella subcapitata* (OECD Guideline 201, static)
The product has low solubility in the test medium. A saturated solution has been tested. The details of the toxic effect relate to the nominal concentration.

EC10 (72 h) 6 mg/l (growth rate), *Pseudokirchneriella subcapitata* (OECD Guideline 201, static)

The product has low solubility in the test medium. A saturated solution has been tested. The details of the toxic effect relate to the nominal concentration.

Microorganisms/Effect on activated sludge:

EC20 (3 h) > 1,000 mg/l, activated sludge, domestic (OECD Guideline 209, aerobic)

Chronic toxicity to fish:

No data available regarding toxicity to fish.

Chronic toxicity to aquatic invertebrates:

No data available regarding toxicity to daphnids.

Assessment of terrestrial toxicity:

No data available concerning terrestrial toxicity.

12.2. Persistence and degradability

Assessment biodegradation and elimination (H₂O):

Not readily biodegradable (by OECD criteria). Poorly biodegradable.

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Elimination information:

(28 d) (calculated) (aerobic) Not readily biodegradable (by OECD criteria).

The product has not been tested. The statement has been derived from the structure of the product.

Assessment of stability in water:

No data available.

Information on Stability in Water (Hydrolysis):

No data available.

12.3. Bioaccumulative potential

Assessment bioaccumulation potential:

No significant accumulation in organisms is expected as a result of the distribution coefficient of n-octanol/water (log Pow).

Bioaccumulation potential:

No significant accumulation in organisms is expected as a result of the distribution coefficient of n-octanol/water (log Pow).

12.4. Mobility in soil

Assessment transport between environmental compartments:

Adsorption in soil: Adsorption to solid soil phase is not expected.

12.5. Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

12.6. Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

12.7. Additional information

The product contains: OXIDIZED COPPER POWDER

Add. remarks environm. fate & pathway:

Treatment in biological waste water treatment plants has to be performed according to local and administrative regulations.

Other ecotoxicological advice:

Do not discharge product into the environment without control.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Must be disposed of or incinerated in accordance with local regulations.

The UK Environmental Protection (Duty of Care) Regulations (EP) and amendments should be noted (United Kingdom).

This product and any uncleaned containers must be disposed of as hazardous waste in accordance with the 2005 Hazardous Waste Regulations and amendments (United Kingdom)

Contaminated packaging:

Uncontaminated packaging can be re-used.

Packs that cannot be cleaned should be disposed of in the same manner as the contents.

SECTION 14: Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Inland waterway transport

ADN

Not classified as a dangerous good under transport regulations

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UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

Transport in inland waterway vessel
Not evaluated

Sea transport

IMDG

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

Air transport

IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

14.1. UN number

See corresponding entries for "UN number" for the respective regulations in the tables above.

14.2. UN proper shipping name

See corresponding entries for "UN proper shipping name" for the respective regulations in the tables above.

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14.3. Transport hazard class(es)

See corresponding entries for "Transport hazard class(es)" for the respective regulations in the tables above.

14.4. Packing group

See corresponding entries for "Packing group" for the respective regulations in the tables above.

14.5. Environmental hazards

See corresponding entries for "Environmental hazards" for the respective regulations in the tables above.

14.6. Special precautions for user

See corresponding entries for "Special precautions for user" for the respective regulations in the tables above.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Regulation:	Not evaluated
Shipment approved:	Not evaluated
Pollution name:	Not evaluated
Pollution category:	Not evaluated
Ship Type:	Not evaluated

SECTION 15: Regulatory Information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

The data should be considered when making any assessment under the Control of Substances Hazardous to Health Regulations (COSHH), and related guidance, for example, 'COSHH Essentials' (United Kingdom).

15.2. Chemical Safety Assessment

| Chemical Safety Assessment performed

SECTION 16: Other Information

Full text of the classifications, including the hazard classes and the hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
H332	Harmful if inhaled.

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If you have any queries relating to this MSDS, its contents or any other product safety related questions, please write to the following e-mail address: accounts@michaelharding.co.uk

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.

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Annex: Exposure Scenarios

Index

1. Industrial formulation of non-solid preparations containing pigment (including inks and paints)
 SU3; ERC2; PROC5, PROC8b, PROC9, PROC15
2. Industrial formulation of solid preparations containing pigment (including plastics)
 SU3; SU17; ERC5; PROC5, PROC7, PROC8a, PROC13, PROC15, PROC21
3. Wide dispersive indoor use (professional) of additive resulting in inclusion into a matrix, including application in coatings, adhesives and plastics
 SU22; SU17; ERC8c; PROC10, PROC11, PROC21
4. Wide dispersive outdoor use of long-life articles and materials with low release, including coatings, adhesives and plastics
 ERC10a; AC1

1. Short title of exposure scenario

Industrial formulation of non-solid preparations containing pigment (including inks and paints)
 SU3; ERC2; PROC5, PROC8b, PROC9, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation of preparations As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	
Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.7429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.831169
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.27 mg/m ³
Risk Characterization Ratio (RCR)	0.114894
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6457 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.498701
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

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Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 100 %
Physical state	Solid, high dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 95 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.207792
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.25 mg/m ³
Risk Characterization Ratio (RCR)	0.531915
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 10 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2743 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.083117
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	0.1 mg/m ³
Risk Characterization Ratio (RCR)	0.042553
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6457 mg/kg bw/day
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Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 100 %
Physical state	Solid, high dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Local exhaust ventilation	Effectiveness: 90 %
Provide a good standard of general ventilation (not less than 3 - 5 air changes per hour)	Effectiveness: 30 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker, Reduction factor for local exhaust ventilation (LEV) has been used for the calculation of dermal exposure estimates.
	Worker - dermal, long-term - systemic
Exposure estimate	0.6857 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.207792
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.28 mg/m ³
Risk Characterization Ratio (RCR)	0.119149
Guidance to Downstream Users	
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Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial

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Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.8229 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.249351
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 5 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.3714 mg/kg bw/day

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Risk Characterization Ratio (RCR)	0.415584
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.27 mg/m ³
Risk Characterization Ratio (RCR)	0.114894
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 100 %
Physical state	Solid, high dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	15 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.103896
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.5 mg/m ³
Risk Characterization Ratio (RCR)	0.212766
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2057 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.062338
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

2. Short title of exposure scenario

Industrial formulation of solid preparations containing pigment (including plastics)
 SU3; SU17; ERC5; PROC5, PROC7, PROC8a, PROC13, PROC15, PROC21

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC5: Industrial use resulting in inclusion into or onto a matrix As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week

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Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6457 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.498701
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC7: Industrial spraying Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.5714 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.779221
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	0.0001 mg/m ³
Risk Characterization Ratio (RCR)	0.000006
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see	

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Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or preparation (charging/discharging) from/to ves-sels/large containers at non-dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6457 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.498701
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC13: Treatment of articles by dipping and pouring. Use domain: industrial
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C

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Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.6457 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.498701
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Toxx_1 Content: >= 0 % - <= 25 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.2057 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.062338
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.81 mg/m ³
Risk Characterization Ratio (RCR)	0.344681
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent.

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	Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 100 %
Physical state	Solid, high dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	60 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker Worker - dermal, long-term - systemic
Exposure estimate	0.3429 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.103896
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker Worker - inhalation, long-term - systemic
Exposure estimate	1 mg/m ³
Risk Characterization Ratio (RCR)	0.425532
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC21: Low energy manipulation of substances bound in materials and/or articles Use domain: industrial
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 25 %
Physical state	Solid, low dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker Worker - dermal, long-term - systemic
Exposure estimate	1.6971 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.514286

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Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.6 mg/m ³
Risk Characterization Ratio (RCR)	0.255319
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

3. Short title of exposure scenario

Wide dispersive indoor use (professional) of additive resulting in inclusion into a matrix, including application in coatings, adhesives and plastics
SU22; SU17; ERC8c; PROC10, PROC11, PROC21

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

Contributing exposure scenario	
Use descriptors covered	PROC10: Roller application or brushing Use domain: professional
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 10 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic

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Exposure estimate	0.5486 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.166234
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	0.1 mg/m ³
Risk Characterization Ratio (RCR)	0.042553
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC11: Non industrial spraying Use domain: professional
Operational conditions	
Concentration of the substance	Test_ToX_1 Content: >= 0 % - <= 10 %
Physical state	liquid
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	30 min 5 days per week
Indoor/Outdoor	Indoor
Risk Management Measures	
Use suitable chemically resistant gloves.	Effectiveness: 80 %
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version, The duration of activity has been considered using a linear approach., The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.1339 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.040584
Assessment method	EASY TRA v4.1, Workplace measurements
	Worker - inhalation, long-term - systemic
Exposure estimate	0.1 mg/m ³
Risk Characterization Ratio (RCR)	0.042553
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC21: Low energy manipulation of substances bound in materials and/or articles

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	Use domain: professional
Operational conditions	
Concentration of the substance	Test_Tox_1 Content: >= 0 % - <= 10 %
Physical state	Solid, low dustiness
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
Duration and Frequency of activity	480 min 5 days per week
Indoor/Outdoor	Indoor
Exposure estimate and reference to its source	
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.2829 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.085714
Assessment method	EASY TRA v4.1, ECETOC TRA v3.0, worker, modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.3 mg/m ³
Risk Characterization Ratio (RCR)	0.12766
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra Please note that a modified version has been used (see exposure estimates)	

4. Short title of exposure scenario

Wide dispersive outdoor use of long-life articles and materials with low release, including coatings, adhesives and plastics
 ERC10a; AC1

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC10a: Wide dispersive outdoor use of long-life articles and materials with low release As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.
Operational conditions	

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Contributing exposure scenario	
Use descriptors covered	AC1: Vehicles Exposure is considered negligible.
Operational conditions	
Vapour pressure of the substance during use	0.001 Pa
Process temperature	20 °C
