Banner Chemicals Group UK
Flying the flag of excellence for over 150 years

SAFETY DATA SHEET
BUTYL GLYCOL ACETATE

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name	BUTYL GLYCOL ACETATE
Product No.	0299
REACH Registration number	01-2119475112-47-xxxx
CAS-No.	112-07-2
EU Index No.	607-038-00-2
EC No.	203-933-3

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

Identified uses	Solvent for Industrial Use
	Raw material for printing inks and printing ink additives.

1.3. Details of the supplier of the safety data sheet

Supplier	Samuel Banner & Co Ltd Hampton Court Manor Park Runcorn Cheshire WA7 1TU, UK +44 (0)1928 597 000 (General Enquiries) +44 (0)1928 597 001 (Fax) www.bannerchemicals.com
Contact Person	sdsorder@bannerchemicals.com

1.4. Emergency telephone number

0207 405 5375 (National Chemical Emergency Centre)
0870 190 6777 (National Chemical Emergency Centre)
+44 (0)1270 502891

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical and Chemical Hazards	Not classified.
Human health	Acute Tox. 4 - H302;Acute Tox. 4 - H312
Environment	Not classified.

Classification (1999/45/EEC) Xn;R20/21.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

2.2. Label elements

EC No. 203-933-3

Contains 2-BUTOXYETHYL ACETATE

Label In Accordance With (EC) No. 1272/2008

Signal Word Warning

BUTYL GLYCOL ACETATE

Hazard Statements

H302	Harmful if swallowed.
H312	Harmful in contact with skin.

Precautionary Statements

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P264	Wash contaminated skin thoroughly after handling.
P301+312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+352	IF ON SKIN: Wash with plenty of soap and water.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P363	Wash contaminated clothing before reuse.

2.3. Other hazards

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures

2-BUTOXYETHYL ACETATE **55-100%**

CAS-No.: 112-07-2 **EC No.: 203-933-3**

Classification (EC 1272/2008)	Classification (67/548/EEC)
Acute Tox. 4 - H312 Acute Tox. 4 - H332	Xn;R20/21

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

REACH Registration number	01-2119475112-47-xxxx
CAS-No.	112-07-2
EU Index No.	607-038-00-2
EC No.	203-933-3

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

General information

Remove victim immediately from source of exposure. Provide fresh air, warmth and rest, preferably in comfortable upright sitting position. Perform artificial respiration if breathing has stopped. Do not give victim anything to drink if they are unconscious.

Inhalation

Remove victim immediately from source of exposure. Move into fresh air and keep at rest. Perform artificial respiration if breathing has stopped. Get medical attention if any discomfort continues.

Ingestion

Immediately rinse mouth and provide fresh air. DO NOT induce vomiting if swallowed chemical is dissolved in petroleum-based material. Danger of aspiration and development of chemical pneumonia. Get medical attention immediately!

Skin contact

Remove contaminated clothes and rinse skin thoroughly with water. Rinse with water. Contact physician if discomfort continues.

Eye contact

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention if any discomfort continues.

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

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

Treat Symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media

Extinguish with foam, carbon dioxide, dry powder or water fog. Water spray, fog or mist.

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

BUTYL GLYCOL ACETATE

Unusual Fire & Explosion Hazards

Vapours are heavier than air and may spread near ground to sources of ignition. May travel considerable distance to source of ignition and flash back. Forms explosive mixtures with air.

5.3. Advice for firefighters

Special Fire Fighting Procedures

Keep up-wind to avoid fumes. If possible, fight fire from protected position. Move container from fire area if it can be done without risk. Use supplied air respirator if product is involved in a fire. Cool containers exposed to flames with water until well after the fire is out. Keep run-off water out of sewers and water sources. Dike for water control. Avoid water in straight hose stream; will scatter and spread fire.

Protective equipment for fire-fighters

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Wear protective clothing as described in Section 8 of this safety data sheet. Ensure suitable personal protection (including respiratory protection) during removal of spillages in a confined area. In case of inadequate ventilation, use respiratory protection. Take precautionary measures against static discharges. Do not smoke, use open fire or other sources of ignition. Do not breathe vapour. Eye contact MUST be prevented by means of suitable personal protection equipment.

6.2. Environmental precautions

Do not discharge onto the ground or into water courses. Do not allow ANY environmental contamination. Never use water by itself on spillage; this will spread the spill and cause further contamination.

6.3. Methods and material for containment and cleaning up

If leakage cannot be stopped, evacuate area. Clean-up personnel should use respiratory and/or liquid contact protection. Wash thoroughly after dealing with a spillage. Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. Absorb spillage with non-combustible, absorbent material. Cover large spillage with alcohol-resistant foam. Dam and absorb spillage with sand, earth or other non-combustible material. Runoff or release to sewer, waterway or ground is forbidden. Inform Authorities if large amounts are involved. Spillage may be stored as chemical waste in approved area.

6.4. Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid spilling, skin and eye contact. Keep away from heat, sparks and open flame. Eliminate all sources of ignition. Static electricity and formation of sparks must be prevented. Storage tanks and other containers must be grounded. Protect electric equipment against sparking in case of risk of explosion. Wear full protective clothing for prolonged exposure and/or high concentrations. Contaminated rags and cloths must be put in fireproof containers for disposal. Always remove grease with soap and water or skin cleaning agent, never use organic solvents. Do not eat, drink or smoke when using the product. Container must be kept tightly closed.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. Keep containers tightly closed. Keep away from food, drink and animal feeding stuffs. Avoid contact with oxidising agents. Flammable/combustible - Keep away from oxidisers, heat and flames. Ground container and transfer equipment to eliminate static electric sparks. Keep in original container.

7.3. Specific end use(s)

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Name	STD	TWA - 8 Hrs		STEL - 15 Min		Notes
2-BUTOXYETHYL ACETATE	WEL	20 ppm(Sk)		50 ppm(Sk)		

WEL = Workplace Exposure Limit.

DNEL

Industry	Dermal	102	mg/kg/day
Industry	Inhalation.	775	mg/m3
Consumer	Dermal	27 mg/kg	
Consumer	Inhalation.	499	mg/m3
Consumer	Oral	18	mg/kg/day

PNEC

Freshwater	0.304	mg/l
Marinewater	0.0304	mg/l
Sediment	2.03 (fresh water)	mg/kg

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Sediment	0.203 (marine)	mg/kg
Soil	0.68	mg/kg

8.2. Exposure controls

Protective equipment


Process conditions

Use engineering controls to reduce air contamination to permissible exposure level. Provide eyewash, quick drench.

Engineering measures

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Explosion-proof general and local exhaust ventilation.

Respiratory equipment

If ventilation is insufficient, suitable respiratory protection must be provided. At work in confined or poorly ventilated spaces, respiratory protection with air supply must be used. Check that mask fits tight and change filter regularly.

Hand protection

Protective gloves must be used if there is a risk of direct contact or splash. Manufactured/tested in accordance with EN 374. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

Eye protection

Wear splash-proof eye goggles to prevent any possibility of eye contact. If risk of splashing, wear safety goggles or face shield. Manufactured/Tested in accordance with EN 166.

Other Protection

Use barrier creams to prevent skin contact. Provide eyewash station and safety shower. Wear appropriate clothing to prevent repeated or prolonged skin contact.

Hygiene measures

Wash hands at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes wet or contaminated. Eating, smoking and water fountains prohibited in immediate work area. DO NOT SMOKE IN WORK AREA!

Skin protection

Wear apron or protective clothing in case of splashes.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Clear liquid.
Colour	Colourless.
Odour	Mild.
Solubility	Miscible with water
Initial boiling point and boiling range	192 760 mm Hg
Melting point (°C)	-64
Relative density	0.939 20
Vapour density (air=1)	6
Vapour pressure	0.08 kPa 20
Evaporation rate	0.04
Viscosity	1.8 mPas 20
Solubility Value (G/100G H2O@20°C)	15
Flash point	78 CC (Closed cup).
Auto Ignition Temperature (°C)	375
Flammability Limit - Lower(%)	1.7
Flammability Limit - Upper(%)	8.4
Partition Coefficient (N-Octanol/Water)	1.51

9.2. Other information

Refractive Index	1.413 - 1.415

SECTION 10: STABILITY AND REACTIVITY

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10.1. Reactivity

10.2. Chemical stability

Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Hazardous Polymerisation

Will not polymerise.

10.4. Conditions to avoid

Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials To Avoid

Strong oxidising substances. aluminium Air.

10.6. Hazardous decomposition products

None at ambient temperatures. Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

Acute Toxicity (Oral LD50)

< 2000 mg/kg Rat

Acute Toxicity (Dermal LD50)

< 2000 mg/kg Rabbit

Skin Corrosion/Irritation:

Not irritating.

Serious eye damage/irritation:

Not Irritating.

Respiratory or skin sensitisation:

Not sensitising.
Not Sensitising.

Germ cell mutagenicity:

Not mutagenic.

Specific target organ toxicity - repeated exposure:

STOT - Repeated exposure

LOAEL 94 mg/kg Oral Rat

General information

Prolonged and repeated contact with solvents over a long period may lead to permanent health problems. Contains small amounts of organic solvents. Extensive use of the product in areas with inadequate ventilation may result in hazardous vapour concentrations.

Inhalation

Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia. Contains organic solvents which in case of overexposure may depress the central nervous system causing dizziness and intoxication.

Ingestion

Harmful: may cause lung damage if swallowed. Pneumonia may be the result if vomited material containing solvents reaches the lungs.

Skin contact

Repeated exposure may cause skin dryness or cracking.

Eye contact

Irritation of eyes and mucous membranes.

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Health Warnings

Prolonged or repeated contact leads to drying of skin. Prolonged and repeated contact with solvents over a long period may lead to permanent health problems.

Route of entry

Ingestion. Inhalation.

Target Organs

Brain Respiratory system, lungs Mucous membranes

Medical Symptoms

Skin irritation. Irritation of eyes and mucous membranes. High concentrations of vapours may irritate respiratory system and lead to headache, fatigue, nausea and vomiting.

Medical Considerations

Skin disorders and allergies. Convulsive disorders, CNS problems. Risk of chemical pneumonia after aspiration.

Specific effects

Prolonged or repeated contact with used oil may cause serious skin diseases, such as dermatitis. Prolonged or repeated contact with used oil may cause serious skin diseases, such as dermatitis and skin cancer. Prolonged or frequent inhalation of vapours in high concentrations may cause permanent damage to the nervous system, including the brain.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Acute Toxicity - Fish

LC50 48 hours > 10 mg/l Leuciscus idus (Golden orfe)

Acute Toxicity - Aquatic Invertebrates

EC50 > 100 mg/l Daphnia magna

IC 50, 72 Hrs, Algae, mg/l >100

12.2. Persistence and degradability

Degradability

The product is expected to be biodegradable.

Biodegradation

Degradation (70%) > 28 days

Species: activated sludge.

12.3. Bioaccumulative potential

Bioaccumulative potential

The product is not bioaccumulating.

Partition coefficient 1.51

12.4. Mobility in soil

Mobility:

Not available

12.5. Results of PBT and vPvB assessment

This product does not contain any PBT or vPvB substances.

12.6. Other adverse effects

Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

General information

Do not puncture or incinerate even when empty. Waste, residue, empty containers, discarded work clothes and used disposable towels must be collected in designated receptacles, labelled with content. Waste is classified as hazardous waste. Disposal to licensed waste disposal site in accordance with the local Waste Disposal Authority.

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13.1. Waste treatment methods

No specific disposal method required. Contact specialist disposal companies. Do not allow runoff to sewer, waterway or ground. Incinerate in suitable combustion chamber.

SECTION 14: TRANSPORT INFORMATION

General The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

UN No. (ADR/RID/ADN) N/A

14.2. UN proper shipping name

14.3. Transport hazard class(es)

ADR/RID/ADN Class N/A

Transport Labels

No transport warning sign required.

14.4. Packing group

ADR/RID/ADN Packing group N/A

14.5. Environmental hazards

14.6. Special precautions for user

Hazard No. (ADR) N/A.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Cat Y Ship type: 3

SECTION 15: REGULATORY INFORMATION

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

Guidance Notes

Workplace Exposure Limits EH40.

EU Legislation

Regulation (EC) No 1272/2008 CLP. Regulation (EC) No 1907/2006 REACH.

National Regulations

The substance is listed in the following International Inventories or exempt: DSL (CA) TSCA (US) EINECS/ELINCS NZIOc ENCS ISHL AUSTR KOREA PHIL CHINA

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out.

SECTION 16: OTHER INFORMATION

General information

Only trained personnel should use this material.

Revision Comments

Additional substance information received.

Issued By	Compliance Department
Revision Date	12/07/2012
Revision	6
Supersedes date	28/02/2012
SDS No.	0299
Safety Data Sheet Status	Approved.
Date	12-Jul-12

Risk Phrases In Full

R20/21	Harmful by inhalation and in contact with skin.

BUTYL GLYCOL ACETATE

Hazard Statements In Full

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.

Section 1	**Exposure Scenario: Worker**
Title	**Manufacture; 112-07-2**
Sector of Use	SU3
Process Category	PROC1; PROC2; PROC3; PROC4; PROC8a; PROC8b; PROC15
Product Category	n/a
Article Category	n/a
Environmental release Category	ERC1
Specific environmental release category	n/a
Processes, tasks, activities covered	Manufacture of substance, or use as an intermediate or process chemical or extraction agent. Includes recycling/ recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container)
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	vapour pressure < 0.5 kPa
Concentration of substance in product	Up to 100%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated)
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	Assumes use at not > 20C above ambient; Assumes a good basic standard of occupational hygiene is implemented

Risk Management Measures	
Contributing Scenarios	**Risk Management Measures**
General exposures. Continuous process	Handle substance within a closed system. Drain down and flush system prior to equipment break-in or maintenance. Clear spills immediately. Retain drain downs in sealed storage pending disposal or for subsequent recycle
General exposures. Continuous process. With sample collection	Handle substance within a closed system. Wear suitable gloves tested to EN374
General exposures. Use in contained batch processes; With sample collection	Handle substance within a closed system. Wear suitable gloves tested to EN374
Process sampling	Handle substance within a closed system. Wear suitable gloves tested to EN374
Bulk transfers. Internal	Handle substance within a closed system. Clear transfer lines prior to de-coupling.

	Wear suitable gloves tested to EN374
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour) Wear suitable gloves tested to EN374
Bulk transfers. Transport	Handle substance within a closed system. Clear transfer lines prior to de-coupling. Wear suitable gloves tested to EN374.
Bulk product storage	Transfer via enclosed lines. Store substance within a closed system. Avoid dip sampling. Wear suitable gloves tested to EN374.
Laboratory activities	Wear suitable gloves tested to EN374

Section 2.2	**Control of environmental exposure**
Operational conditions	
Contributing scenario	**Manufacturing**
Operational Conditions	
Frequency and duration of use	Type of release: continuous; Emission days (days/year): 300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other Operational Conditions affecting worker exposure	Manufacturing carried out in a closed process
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	n/a
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	All waste water must be processed in an onsite or municipal wastewater treatment plant. The wastewater treatment plant must incorporate both primary and secondary treatments.
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Use bunds or dikes around storage facilities to prevent soil and water pollution in the event of a spill (effectiveness). Prevent discharge of substance to waste water or recover from wastewater.
Conditions and measures related to municipal	E13.23 - Biological treatment – central biological

sewage treatment plant	waste water treatment
Conditions and measures related to external treatment of waste for disposal	Dispose of waste solvent and used containers according to local regulations. Dispose of waste or used sacks/containers according to local regulations.
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	**Exposure estimation**
3.1 Health	The worker exposure estimates for the activities associated have been assessed using ECETOC TRA, unless stated differently.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1 Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).

Section 1	**Exposure Scenario Title Worker**
Title	**Formulation & (re)packing of substances and mixtures, industrial**
Sector of Use	SU3
Process Category	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15
Product Category	n/a
Article Category	n/a
Environmental release Category	ERC2
Specific environmental release category	n/a
Processes, tasks, activities covered	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, large and small scale packing, maintenance and associated laboratory activities
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	Liquid, vapour pressure < 0.5 kPa at STP
Concentration of substance in product	Up to 100%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated)
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	Assumes use at not > 20C above ambient Assumes a good basic standard of occupational hygiene is implemented

Risk Management Measures	
Contributing Scenarios	**Risk Management Measures**
General exposures. Continuous process; No sampling. e.g. In-line additive dosing equipment, in-line filter cleaning	Handle substance within a closed system
General exposures. Continuous process; With sample collection	Handle substance within a closed system. Wear suitable gloves tested to EN374
General exposures. Use in contained batch processes; With sample collection	Handle substance within a closed system. Wear suitable gloves tested to EN374
General exposures. General exposures (open systems)	Wear suitable gloves tested to EN374
Process sampling	Wear suitable gloves tested to EN374
Bulk transfers	Handle substance within a closed system.

	Wear suitable gloves tested to EN374
Mixing operations (open systems)	Wear suitable gloves tested to EN374
Transfer from/pouring from container; Manual	Use drum pumps or carefully pour from container Provide a good standard of general or controlled ventilation (5-15 air changes per hour) Wear suitable gloves tested to EN374}
Equipment cleaning and maintenance	Drain down and flush system prior to equipment break-in or maintenance Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour) Wear suitable gloves tested to EN374
Drum/batch transfers	Use drum pumps or carefully pour from container Avoid spillage when withdrawing pump Wear suitable gloves tested to EN374
Drum and small package filling	Clear spills immediately Put lids on containers immediately after use Wear suitable gloves tested to EN374
Bulk product storage Transfer via enclosed lines	Store substance within a closed system. Avoid dip sampling Ensure material transfers are under containment or extract ventilation Wear suitable gloves tested to EN374
Laboratory activities	Wear suitable gloves tested to EN374

Section 2.2	**Control of environmental exposure**
Operational conditions	
Contributing scenario	**Formulation & (re)packing of substances and mixtures, industrial**
Operational Conditions	
Frequency and duration of use	Type of release: continuous; Emission days (days/year): 300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	Manufacturing carried out in a closed process
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	n/a
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	All waste water must be processed in an onsite or municipal wastewater treatment plant. The wastewater treatment plant must incorporate both primary and secondary treatments.
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the

	impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Use bunds or dikes around storage facilities to prevent soil and water pollution in the event of a spill (effectiveness). Prevent discharge of substance to waste water or recover from wastewater.
Conditions and measures related to municipal sewage treatment plan	E13.23 - Biological treatment – central biological waste water treatment
Conditions and measures related to external treatment of waste for disposal	Dispose of waste solvent and used containers according to local regulations. Dispose of waste or used sacks/containers according to local regulations.
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	**Exposure estimation**
3.1 Health	The worker exposure estimates for the activities associated have been assessed using ECETOC TRA, unless stated differently.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1 Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).

Section 1	Exposure Scenario: Worker
Title	**Distribution**
Sector of Use	SU3
Process Category	PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15
Product Category	n/a
Article Category	n/a
Environmental release Category	ERC1; ERC2
Specific environmental release category	n/a
Processes, tasks, activities covered	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its distribution and associated laboratory activities
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	vapour pressure < 0.5 kPa
Concentration of substance in product	Up to 100%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated)
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	Assumes use at not > 20C above ambient; Assumes a good basic standard of occupational hygiene is implemented

Risk Management Measures	
Contributing Scenarios	**Risk Management Measures**
General process exposures - closed process (e.g. In-line additive dosing equipment, in-line filter cleaning) Continuous; Outdoor; daily; 15 - 1 hour; product temp.	Handle substance within a closed system
General process exposures (occasional controlled exposure) Continuous; Outdoor; daily; 15 mins - 1 hour; product temp.	Handle substance within a closed system. Wear suitable gloves tested to EN374
General process exposures - closed batch process Batch process; Outdoor; daily; 15 -1 hour; product temp.	Handle substance within a closed system. Wear suitable gloves tested to EN374
General exposures open batch process Daily; Indoor/Outdoor; 15 - 1 hour;	Wear suitable gloves tested to EN374. Clear transfer lines prior to de-coupling

product temp.	
Sample collection Daily; <15 mins; product temp.; Outdoor;	Avoid dip sampling Wear suitable gloves tested to EN374
Laboratory activities Daily; 15 mins - 1 hour; product temp.; Indoor	Wear suitable gloves tested to EN374
Bulk closed loading and unloading NEW CS (e.g. road/rail car bottom loading/unloading; marine vessel/barge loading/unloading) Bulk transfers, closed systems] Outdoor; Daily; 15 - 1 hour; product temp.; exposure potential during breaking of hose connection	Wear suitable gloves tested to EN374. Clear transfer lines prior to de-coupling
Bulk open loading NEW CS (e.g. road/rail car top loading, may involve LEV) Bulk transfers, open systems] Outdoor; Daily; 1 -4 hours; product temp; exposure potential from vapour emissions from tank opening	Wear suitable gloves tested to EN374. Clear transfer lines prior to de-coupling
Drum and small package filling Indoor; Continuous; daily; 8 hour; product temp.	Clear spills immediately Wear suitable gloves tested to EN374
Clean down and Maintenance Daily; 15 min - 1 hour; product temp; collection of line waste in container	Drain down and flush system prior to equipment break-in or maintenance. Apply vessel entry procedures including use of forced supplied air. Wear suitable gloves tested to EN374. Transfer via enclosed lines Retain drain downs in sealed storage pending disposal or for subsequent recycle Provide a good standard of general or controlled ventilation (5-15 air changes per hour)
Storage Daily; 8 hrs; product temp; Outdoors	Transfer via enclosed lines. Store substance within a closed system. Avoid dip sampling

Section 2.2	**Control of environmental exposure**
Operational conditions	
Contributing scenario	**Distribution**
Operational Conditions	
Frequency and duration of use	Type of release: continuous; Emission days (days/year): 300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	n/a

Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	n/a
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	All waste water must be processed in an onsite or municipal wastewater treatment plant. The wastewater treatment plant must incorporate both primary and secondary treatments.
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Use bunds or dikes around storage facilities to prevent soil and water pollution in the event of a spill (effectiveness). Prevent discharge of substance to waste water or recover from wastewater.
Conditions and measures related to municipal sewage treatment plant	E13.23 - Biological treatment – central biological waste water treatment
Conditions and measures related to external treatment of waste for disposal	Dispose of waste solvent and used containers according to local regulations. Dispose of waste or used sacks/containers according to local regulations.
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	**Exposure estimation**
3.1 Health	The worker exposure estimates for the activities associated have been assessed using ECETOC TRA, unless stated differently.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1 Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions

	are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).

Section 1	**Exposure Scenario Worker**
Title	**Coatings, industrial**
Sector of Use	SU3
Process Category	PROC1, PROC2, PROC3, PROC4, PROC5, PROC7, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15
Product Category	n/a
Article Category	n/a
Environmental release Category	ERC4
Specific environmental release category	n/a
Processes, tasks, activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, spreader, dip, flow, fluidised bed on production lines and film formation) and equipment cleaning, maintenance and associated laboratory activities.
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	vapour pressure < 0.5 kPa
Concentration of substance in product	Up to 100%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated)
Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	Assumes use at not > 20C above ambient; Assumes a good basic standard of occupational hygiene is implemented

Risk Management Measures	
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems)	Handle substance within a closed system
General exposures (closed systems). with sample collection. Use in contained systems	Handle substance within a closed system. Wear suitable gloves tested to EN374
Film formation - force drying (50 - 100℃). Stoving (>100℃). UV/EB radiation curing	Handle substance within a closed system. Ensure material transfers are under containment or extract ventilation Wear suitable gloves tested to EN374
Mixing operations (closed systems). General exposures (closed systems)	Handle substance within a closed system. Wear suitable gloves tested to EN374
Film formation - air drying	Provide extract ventilation to points where emissions occur Avoid manual contact with wet work pieces Wear suitable gloves tested to EN374
Preparation of material for application. Mixing operations (open systems)	Avoid manual contact with wet work pieces Wear suitable gloves tested to EN374
Manual. Spraying	Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Wear a respirator conforming to EN140 with Type A filter or better. Wear suitable gloves tested to EN374
Material transfers	Clear transfer lines prior to de-coupling. Wear suitable gloves tested to EN374
Material transfers	Clear transfer lines prior to de-coupling. Wear suitable gloves tested to EN374
Roller, spreader, flow application	Provide enhanced general ventilation by mechanical means. Wear suitable gloves tested to EN374
Dipping, immersion and pouring	Avoid manual contact with wet work pieces. Provide enhanced general ventilation by mechanical means. Clear up spills immediately and dispose of waste safely Wear suitable gloves tested to EN374
Laboratory activities	Wear suitable gloves tested to EN374
Material transfers. Drum/batch transfers. Transfer from/pouring from containers	Wear suitable gloves tested to EN374

Section 2.2	Control of environmental exposure
Operational conditions	
Contributing scenario	**Coatings, industrial**
Operational Conditions	
Frequency and duration of use	Type of release: continuous; Emission days (days/year): 300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100

Other given operational conditions affecting environmental exposure	n/a
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	n/a
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	All waste water must be processed in an onsite or municipal wastewater treatment plant. The wastewater treatment plant must incorporate both primary and secondary treatments.
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Use bunds or dikes around storage facilities to prevent soil and water pollution in the event of a spill (effectiveness). Prevent discharge of substance to waste water or recover from wastewater.
Conditions and measures related to municipal sewage treatment plant	E13.23 - Biological treatment – central biological waste water treatment
Conditions and measures related to external treatment of waste for disposal	Dispose of waste solvent and used containers according to local regulations. Dispose of waste or used sacks/containers according to local regulations.
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	**Exposure estimation**
3.1 Health	The worker exposure estimates for the activities associated have been assessed using ECETOC TRA, unless stated differently.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1 Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are

	adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).

Section 1	**Exposure Scenario: Workers**
Title	**Uses in Coatings, professional**
Sector of Use	SU22
Process Category	PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC10, PROC11, PROC13, PROC15, PROC19
Product Category	n/a
Article Category	n/a
Environmental release Category	ERC 8a, ERC 8d
Specific environmental release category	N/A
Processes, tasks, activities covered	Covers the use in coatings (paints, inks, adhesives, etc) including exposures during use (including materials receipt, storage, preparation and transfer from bulk and semi-bulk, application by spray, roller, brush, spreader by hand or similar methods, and film formation), and equipment cleaning, maintenance and associated laboratory activities.
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	vapour pressure < 0.5 kPa
Concentration of substance in product	Up to 100%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated)

Human factors not influenced by risk management	n/a
Other Operational Conditions affecting worker exposure	Assumes use at not more than 20 deg above ambient temperature; Assumes a good basic standard of occupational hygiene is implemented

Risk Management Measures	
Contributing Scenarios	**Risk Management Measures**
General exposures (closed systems)	Handle substance within a closed system. Wear suitable gloves tested to EN374
Filling / preparation of equipment from drums or containers.	Handle substance within a closed system. Use drum pumps or carefully pour from container Wear suitable gloves tested to EN374
General exposures (closed systems). Use in contained systems	Handle substance within a closed system. Wear suitable gloves tested to EN374
Preparation of material for application	Use drum pumps or carefully pour from container Clear up spills immediately and dispose of waste safely Wear suitable gloves tested to EN374
Film formation - air drying. Outdoor	Wear suitable gloves tested to EN374. Avoid manual contact with wet work pieces} Ensure operation is undertaken outdoors
Film formation - air drying. Indoor	Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Avoid manual contact with wet work pieces Wear suitable gloves tested to EN374
Preparation of material for application. Indoor	Provide a good standard of controlled or general ventilation (5-10 air changes per hour). Wear chemically resistant gloves tested to EN374
Preparation of material for application. Outdoor	Wear suitable gloves tested to EN374. Ensure operation is undertaken outdoors
Material transfers. Drum/batch transfers	Provide a good standard of controlled or general ventilation (5-15 air changes per hour). Wear chemically resistant gloves tested to EN374
Material transfers. Drum/batch transfers	Use drum pumps or carefully pour from container Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation means air is supplied or removed by a powered fan. Wear suitable gloves tested to EN374
Roller, spreader, flow application. Indoor	Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training
Roller, spreader, flow application. Outdoor	Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Limit the substance in the product to 25%. Ensure operation is undertaken outdoors
Manual. Spraying. Indoor	Carry out in a vented booth. Avoid carrying out operation for more than 1 hour. Wear suitable gloves tested to EN374
Manual. Spraying. Outdoor	Ensure operation is undertaken outdoors. Avoid carrying out operation for more than 4 hours. Wear a respirator conforming to EN140 with Type A filter or

	better. Wear chemically resistant gloves tested to EN374
Dipping, immersion and pouring. Indoor	Avoid manual contact with wet work pieces. Provide a good standard of general ventilation. Natural ventilation is from windows and doors etc. Controlled ventilation is supplied or removed by a powered fan. Clear up spills immediately and dispose of waste safely Wear suitable gloves tested to EN374}
Dipping, immersion and pouring. Outdoor	Ensure operation is undertaken outdoors. Wear chemically resistant gloves tested to EN37. Avoid manual contact with wet work pieces. Clear up spills immediately and dispose of waste safely
Laboratory activities	Wear suitable gloves tested to EN374
Hand application - fingerpaints, pastels, adhesives. Indoor	Provide a good standard of general or controlled ventilation (5 to 10 air changes per hour). Wear chemically resistant gloves (tested to EN374) in combination with specific activity training
Hand application - fingerpaints, pastels, adhesives. Outdoor	Ensure operation is undertaken outdoors. Wear chemically resistant gloves (tested to EN374) in combination with specific activity training Avoid carrying out operation for more than 4 hours

Section 2.2	**Control of environmental exposure**
Operational conditions	
Contributing scenario	**Uses in Coatings, professional**
Operational Conditions	
Frequency and duration of use	Type of release: continuous; Emission days (days/year): 300
Environmental factors not influenced by risk management	
Local freshwater dilution factor	10
Local marine water dilution factor	100
Other given operational conditions affecting environmental exposure	n/a
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	n/a
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	All waste water must be processed in an onsite or municipal wastewater treatment plant. The wastewater treatment plant must incorporate both primary and secondary treatments.
Organizational measures to prevent/limit release from site	Site should have a spill plan to ensure that adequate safeguards are in place to minimize the impact of episodic releases. A leak prevention plan is needed to prevent low level continual releases. Use bunds or dikes around storage facilities to

	prevent soil and water pollution in the event of a spill (effectiveness). Prevent discharge of substance to waste water or recover from wastewater.
Conditions and measures related to municipal sewage treatment plant	E13.23 - Biological treatment – central biological waste water treatment
Conditions and measures related to external treatment of waste for disposal	Dispose of waste solvent and used containers according to local regulations. Dispose of waste or used sacks/containers according to local regulations.
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	**Exposure estimation**
3.1 Health	The worker exposure estimates for the activities associated have been assessed using ECETOC TRA, unless stated differently.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	**Guidance to check compliance with the Exposure Scenario**
4.1 Health	Estimated workplace exposures are not expected to exceed DNELs when the identified risk management measures are adopted. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).

Section 1	**Exposure Scenario Consumer**
Title	**Use in coatings, consumer**
Sector of Use	SU21
Process Category	n/a
Product Category	PC9a
Article Category	n/a
Environmental release Category	ERC8a, ERC8d
Specific environmental release category	n/a
Processes, tasks, activities covered	Covers the use in water based coatings (paints, inks, adhesives, etc) including exposures during use (including product transfer and preparation, application by brush, roller by hand or similar methods) and equipment cleaning.
Section 2	**Operational conditions and risk management measures**
Product characteristics	
Physical form of product	Liquid
Volatility	High volatility (ECETOC rating) >10Pa
Concentration of substance in product	Up to 3%
Section 2.1	**Control of worker exposure**
Operational conditions	
Frequency and duration of use	4 x per year (ESIG/ESVOC default)
Human factors not influenced by risk management	User can increase ventilation by opening windows during painting.
Other Operational Conditions affecting worker exposure	Indoor or outdoor use at ambient temperature. Substance evaporates during drying to form a dry paint film. Substance always used neat.
Risk Management Measures	
Product (sub) Categories	
Waterborne latex wall paint	No specific measures required

Section 2.2	Control of environmental exposure
Operational conditions	
Contributing scenario	**Use in coatings, consumer**
Operational Conditions	
Frequency and duration of use	Type of release: Wide Dispersive use; Emission days (days/year): 365
Environmental factors not influenced by risk management	
Local freshwater dilution factor	n/a
Local marine water dilution factor	n/a
Other given operational conditions affecting environmental exposure	n/a
Risk Management Measures	
Technical conditions and measures at process level (source) to prevent release	None. Not applicable – consumer scenario
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	None. Not applicable – consumer scenario
Organizational measures to prevent/limit release from site	None. Not applicable – consumer scenario
Conditions and measures related to municipal sewage treatment plant	Assumed 2000m3/day flow rate
Conditions and measures related to external treatment of waste for disposal	n/a
Conditions and measures related to external recovery of waste	n/a
Other environmental control measures additional to above	n/a

Section 3	Exposure estimation
3.1 Health	The ConsExpo tool has been used to estimate consumer exposures unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted DNELs and the resulting risk characterisation ratios are expected to be less than 1.
3.2 Environment	EUSES version 2.1. has been used to estimate environmental emissions unless otherwise indicated. When the recommended risk management measures and operational conditions are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterisation ratios are expected to be less than 1.

Section 4	Guidance to check compliance with the Exposure Scenario
4.1 Health	Predicted exposures are not expected to exceed the DN(M)EL when the risk management measures/operational conditions outlined in section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.
4.2 Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet (http://cefic.org/en/reach-forindustries-libraries.html).