Safety Data Sheet SandBar Acid Surfactant

Date of Issue : 04.02.2018	Replaces: 04.02.2015	Valid no longer than : 04.11.2021

1. Chemical product and company identification

Chemical Name / Technical Nature :	**Synonyms :**
Polylactide resin / Formation Cleaner or Conditioner Surfactant	(C6H8O4.C6H8O4.C6H8O4)x, 1,4-dioxane-2,5-dione, 3,6-dimethyl-, (3R,6R)-, polymer with (3S,6S)-3, 6-dimethyl-1, 4-dioxane- 2, 5-dione and (3R,6S)-rel-3, 6-dimethyl-1, 4-dioxane-2, 5-dione, Arsens NCL 111, 112, Bio-Flex F1130, DL-lactide-D-lactide-L-lactide polymer, PLA, Premium 3D Filaments PLA, Revode, dilactide polymer, polylactic acid, polylactide polymers
Chemical Formula: (C6H8O4.C6H8O4.C6H8O4)x	**Relevant identified uses:** • Synthetic polymer. • Personal care product. • For manufacture of films and sheets for food-contact materials.
Supplier : **Well Engineering & Technology Sdn Bhd** Level 10, Menara Weld No. 76 Jln Raja Chulan 50200 Kuala Lumpur	**Emergency Telephone Numbers :** Tel : +603 2026 6787 Fax : +603 2034 2199 Email : welltech@welltechengineering.com

2. Composition / information on ingredients

SUBSTANCES:

CAS No	%[weight]	Name	Classification
9051-89-2	>98	polylactide resin	Skin Corrosion/Irritation Category 2, Eye Irritation Category 2, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation); H315, H319, H335 [1]

Legend: 1. Classified by Chemwatch; 2. Classification drawn from ICOP; 3. Classification drawn from EC Directive 1272/2008-Annex VI; 4. Classification drawn from C&L.

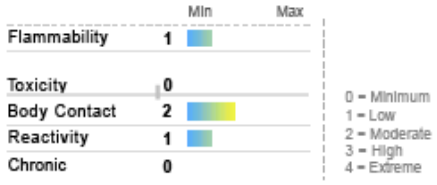
MIXTURES:

See section above for composition of Substances.

3. Hazards Identification

Classification of the Substance or mixture:

Chemwatch Hazard Ratings



Note: The hazard category numbers found in GHS classification

In section of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health, Red = Fire, Yellow = Reactivity, White = Special (Oxidizer or water reactive substance)

Classification [1]	Skin Corrosion/Irritation Category 2, Eye Irritation Category 2, Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation)
Legend:	*1. Classified by Chemwatch; 2. Classification drawn from ICOP ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI*

Label Element

GHS label elements	
Signal word	Warning

Hazard statement (s)

H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation

Precautionary statement (s) Prevention

P271	Use only outdoors or in a well-ventilated area.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

P362	Take off contaminated clothing and wash before reuse.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.

P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Precautionary statement(s) Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

4. First Aid Measures

Description of first aid measures

Eye Contact

If this product comes in contact with the eyes:
Wash out immediately with fresh running water.

- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

For THERMAL burns:

- Do NOT remove contact lens
- Lay victim down, on stretcher if available and pad **BOTH** eyes, make sure dressing does not press on the injured eye by placing thick pads under dressing, above and below the eye.
  Seek urgent medical assistance, or transport to hospital.

Skin Contact

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

In case of burns:

- Immediately apply cold water to burn either by immersion or wrapping with saturated clean cloth.
- **DO NOT** remove or cut away clothing over burnt areas
- **DO NOT** pull away clothing which has adhered to the skin as this can cause further injury.
- **DO NOT** break blister or remove solidified material.
- Quickly cover wound with dressing or clean cloth to help prevent infection and to ease pain.
  For large burns, sheets, towels or pillow slips are ideal; leave holes for eyes, nose and mouth.
- **DO NOT** apply ointments, oils, butter, etc. to a burn under any circumstances.
- Water may be given in small quantities if the person is conscious. Alcohol is not to be given under any circumstances.
- Reassure.
- Treat for shock by keeping the person warm and in a lying position.
- Seek medical aid and advise medical personnel in advance of the cause and extent of the injury and the estimated time of arrival of the patient.

For thermal burns:

- Decontaminate area around burn.
- Consider the use of cold packs and topical antibiotics.

For first-degree burns (affecting top layer of skin):

- Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides. Use compresses if running water is not available.
- Cover with sterile non-adhesive bandage or clean cloth.
- Do NOT apply butter or ointments; this may cause infection.
- Give over-the counter pain relievers if pain increases or swelling, redness, fever occur.

For second-degree burns (affecting top two layers of skin):

- Cool the burn by immerse in cold running water for 10-15 minutes.
- Use compresses if running water is not available.
- Do NOT apply ice as this may lower body temperature and cause further damage.
- Do NOT break blisters or apply butter or ointments; this may cause infection.

	▸ Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape. To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort): ▸ Lay the person flat. ▸ Elevate feet about 12 inches. ▸ Elevate burn area above heart level, if possible. ▸ Cover the person with coat or blanket. ▸ Seek medical assistance. For third-degree burns: ▸ Seek immediate medical or emergency assistance. In the mean time: ▸ Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound. ▸ Separate burned toes and fingers with dry, sterile dressings. ▸ Do not soak burn in water or apply ointments or butter; this may cause infection. ▸ To prevent shock see above. ▸ For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway. Have a person with a facial burn sit up. ▸ Check pulse and breathing to monitor for shock until emergency help arrives.
Inhalation	If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. , Transport to hospital, or doctor, without delay.
Ingestion	▸ Immediately give a glass of water. First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. Fire Fighting Measures

Extinguishing Media:

- Do NOT direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.
- Foam
- Dry chemical powder
- BCF (where regulations permit)
- Carbon Dioxide
- Water spray or fog – Large fires only.

Special hazards arising from the substrate or mixture:

Fire Incompatibility	▸ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters:

Fire Fighting	▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear breathing apparatus plus protective gloves. ▸ Prevent, by any means available, spillage from entering drains or water courses. ▸ Use water delivered as a fine spray to control fire and cool adjacent area. ▸ **DO NOT** approach containers suspected to be hot. ▸ Cool fire exposed containers with water spray from a protected location.
Fire/Explosion Hazard	▸ Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions. ▸ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions). ▸ Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds; once initiated, however, larger particles up to 1400 microns diameter will

	contribute to the propagation of an explosion. ▸ In the same way as gases and vapours, dusts in the form of a cloud are only ignitable over a range of concentrations; in principle, the concepts of lower explosive limit (LEL) and upper explosive limit (UEL) are applicable to dust clouds but only the LEL is of practical use; - this is because of the inherent difficulty of achieving homogeneous dust clouds at high temperatures (for dusts the LEL is often called the "Minimum Explosible Concentration", MEC). ▸ When processed with flammable liquids/vapors/mists,ignitable (hybrid) mixtures may be formed with combustible dusts. Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), other pyrolysis products typical of burning organic materialMay emit poisonous fumes. May emit corrosive fumes. **CARE**: Contamination of heated / molten liquid with water may cause violent steam explosion, with scattering of hot contents.

6. Accidental Release Measures

Personal Precautions, protective equipment and emergency procedure:

Minor Spills	▸ Clean up all spills immediately. ▸ Avoid breathing dust and contact with skin and eyes. ▸ Wear protective clothing, gloves, safety glasses and dust respirator. ▸ Use dry clean up procedures and avoid generating dust. ▸ Sweep up, shovel up or ▸ Vacuum up (consider explosion-proof machines designed to be grounded during storage and use). ▸ Place spilled material in clean, dry, sealable, labelled container.
Major Spills	▸ Moderate hazard. ▸ **CAUTION**: Advise personnel in area. ▸ Alert Emergency Services and tell them location and nature of hazard. ▸ Control personal contact by wearing protective clothing. ▸ Prevent, by any means available, spillage from entering drains or water courses. ▸ Recover product wherever possible.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

7. Handling and Storage

Precautions for safe handling:

Safe handling	▸ The greatest potential for injury caused by molten materials occurs during purging of machinery (moulders, extruders etc.) ▸ It is essential that workers in the immediate area of the machinery wear eye and skin protection (such as full face, safety glasses, heat resistant gloves, overalls and safety boots) as protection from thermal burns. ▸ Fumes or vapours emitted from hot melted materials, during converting operations, may condense on overhead metal surfaces or exhaust ducts. The condensate may contain substances which are irritating or toxic. ▸ Avoid contact of that material with the skin. Wear rubber or other impermeable gloves when cleaning contaminated areas. ▸ Avoid process temperatures above decomposition temperatures. ▸ Avoid all personal contact, including inhalation. ▸ Wear protective clothing when risk of exposure occurs. ▸ Use in a well-ventilated area. ▸ Prevent concentration in hollows and sumps. ▸ **DO NOT** enter confined spaces until atmosphere has been checked. ▸ **DO NOT** allow material to contact humans, exposed food or food utensils. ▸ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions) ▸ Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame. Establish good housekeeping practices. ▸ Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds. ▸ Use continuous suction at points of dust generation to capture and minimise the accumulation of dusts. Particular attention should be given to overhead and hidden horizontal surfaces to minimise the probability of a "secondary" explosion.
Other information	▸ Store in original containers. ▸ Keep containers securely sealed. ▸ Store in a cool, dry area protected from environmental extremes. ▸ Store away from incompatible materials and foodstuff containers. ▸ Protect containers against physical damage and check regularly for leaks. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities:

Suitable container	▸ Polyethylene or polypropylene container. ▸ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	▸ Avoid reaction with oxidising agents

+	X	+	O	+	+	+

x - Must not be stored together
o - May be stored together with specific preventions
+ - May be stored together

8. Exposure Controls / Personal Protection

Control parameters:

Occupational Exposure Limits (OEL).

Ingredient Data - Not available

Emergency Limits:

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
POLYLACTIDE RESIN	Not Available	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
polylactide resin	Not Available	Not Available

Material data:

It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace. At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply. Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life.

Exposure controls:

Appropriate engineering controls	▸ For molten materials: ▸ Provide mechanical ventilation; in general such ventilation should be provided at compounding/ converting areas and at fabricating/ filling work stations where the material is heated. Local exhaust ventilation should be used over and in the vicinity of machinery involved in handling the molten material. ▸ Keep dry!! ▸ Processing temperatures may be well above boiling point of water, so wet or damp material may cause a serious steam explosion if used in unvented equipment. ▸ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. ▸ The basic types of engineering controls are: ▸ Process controls which involve changing the way a job activity or process is done to reduce the risk. ▸ Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Personal protection	
Eye and face protection	▸ Safety glasses with side shields. ▸ Chemical goggles. ▸ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. ▸ Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available.
Skin protection	See Hand protection below
Hands/feet protection	▸ The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application. ▸ The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and.has to be observed when making a final choice. ▸ Suitability and durability of glove type is dependent on usage. ▸ Important factors in the selection of gloves include: - frequency and duration of contact, - chemical resistance of glove material, - glove thickness and dexterity ▸ Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). ▸ When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. ▸ When handling hot materials wear heat resistant, elbow length gloves. Rubber gloves are not recommended when handling ▸ hot objects, materials Protective gloves eg. Leather gloves or

- gloves with Leather facing
- Experience indicates that the following polymers are suitable
- as glove materials for protection against undissolved, dry
- solids, where abrasive particles are not present.
  - polychloroprene.
  - nitrile rubber.
  - butyl rubber.
  - fluorocaoutchouc.
  - polyvinyl chloride.

Body protection

See Other protection below

Other protection

- When handling hot or molten liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
- Usually handled as molten liquid which requires worker thermal protection and increases hazard of vapour exposure.
- CAUTION: Vapours may be irritating.
- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

Thermal hazards

Not Available

Respiratory protection

- Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A P1 Air-line*	- -	A PAPR-P1 -
up to 50 x ES	Air-line**	A P2	A PAPR-P2
up to 100 x ES	-	A P3	-
		Air-line*	-
100+ x ES	-	Air-line**	A PAPR-P3

*Negative pressure demand **Continuous flow
A(All classes)= Organic vapours, B AUS or B1= Acid gasses,
B2 = Acid gas or hydrogen cyanide(HCN),
B3= Acid gas or hydrogen cyanide(HCN), E= Sulfur dioxide(SO2),
G= Agricultural chemicals, K= Ammonia(NH3), Hg= Mercury,
NO= Oxides of nitrogen, MB= Methyl bromide,
AX= Low boiling point organic compounds(below 65˚C)

9. Physical & Chemical Properties

Information on basic physical and chemical properties:

Appearance	▸ Family of products which vary in their physical properties as a result of variations in production. Data presented here is for typical family member. ▸ 22mould White, transparent, translucent, odourless powder or pellets; does not mix with water.

Physical state	Divided Solid	**Relative density (Water = 1)**	1200-1300kg/m3
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature(°C)**	388
pH (as supplied)	Not Applicable	**Decomposition temperature**	250
Melting point / freezing point (°C)	150-180	**Viscosity (cSt)**	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	>250	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	0.15	**Volatile Component (%vol)**	Negligible
Vapour pressure (kPa)	Negligible	**Gas group**	Not Available
Solubility in water (g/L)	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air=1)	Not Applicable	**VOC g/L**	Not Available

10. Stability & Reactivity Data

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

11. Toxicological Information

Inhaled	▸ Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. ▸ In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. ▸ The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. ▸ Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system. ▸ Processing for an overly long time or processing at overly high temperatures may cause generation and release of highly irritating vapours, which irritate eyes, nose, throat, causing red itching eyes, coughing, sore throat. ▸ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. ▸ If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

	▸ Usually handled as molten liquid which requires worker thermal protection and increases hazard of vapour exposure. ▸ **CAUTION:** Vapours may be irritating.
Ingestion	▸ Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident. ▸ Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). ▸ Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern. ▸ High molecular weight material; on single acute exposure would be expected to pass through gastrointestinal tract with little change / absorption. ▸ Occasionally accumulation of the solid material within the alimentary tract may result in formation of a bezoar (concretion), producing discomfort.
Skin Contact	▸ Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. ▸ Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). ▸ The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. ▸ At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis. ▸ The material may accentuate any pre-existing dermatitis condition ▸ Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. ▸ Molten material is capable of causing burns. ▸ Open cuts, abraded or irritated skin should not be exposed to this material ▸ Entry into the blood-stream through, for example, cuts, abrasions,

	puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
Eye	▸ Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. ▸ Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.
Chronic	▸ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. ▸ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. ▸ The material contains a substantial proportion of a polymer considered to be of low concern (PLC). ▸ The trend towards production of lower molecular weight polymers (thus reducing the required level of solvent use and creating a more "environmentally-friendly" material) has brought with it the need to define PLCs as those having molecular weights of between 1000 and 10000 and containing less than 10% of the molecules with molecular weight below 500 and less than 25% of the molecules with a molecular weight below 1000. ▸ These may contain unlimited low concern functional groups or moderate concern reactive functional groups with a combined functional group equivalent weight (FGEW, a concept developed by the US EPA describing whether the reactive functional group is sufficiently diluted by polymeric material) of a 1000 or more (provided no high concern groups are present) or high concern reactive functional groups with a FGEW of 5000 or more (FGEW includes moderate concern groups if present). ▸ Having molecular weights exceeding 10000 (without restriction on reactive groups). ▸ Reactive functional groups are in turn classified as being of low, moderate or high concern Classification of the polymer as a PLC, in accordance with established criteria, does not mean that hazards will not be associated with the polymer (during its import,

manufacture, use, storage, handling or disposal). The polymer may, for example, contain a large number of particles in the respirable range, a hazard which may need to assessed in the health and safety risk assessment.

Polylactide resin

TOXICITY	IRRITATION
Not Available	Not Available

Legend:

1. *Value obtained from Europe ECHA Registered Substances - Acute toxicity*
2. *Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

POLYLACTIDE RESIN

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. Dust may be irritating to eyes, skin and respiratory system. Caused mild to moderate conjuctival irritation in eye irritation studies using rabbits. Caused very mild redness in dermal irritation studies using rabbits (slightly irritating). Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Long term toxicity: Did not cause skin allergic reactions in skin sensitization studies using guinea pigs. Specific effects: May cause skin irritation and/or dermatitis. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. * Toray Advanced Materials SDS

Acute Toxicity	⊘	**Carcinogenicity**	⊘
Skin Irritation/Corrosion	✔	**Reproductivity**	⊘
Serious Eye Damage/Irritation	✔	**STOT - Single Exposure**	✔
Respiratory or Skin sensitisation	⊘	**STOT - Repeated Exposure**	⊘
Mutagenicity	⊘	**Aspiration Hazard**	⊘

Legend: **X** - Data available but does not fill the criteria for classification
✔ - Data require to make classification available.
⊘ - Data Not Available to make classification

12. Ecological Information

Toxicity:

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Legend: *Extracted from 1. IUCLID Toxicity Data, 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity, 3. EPIWIN Suite V3.12 - Aquatic Toxicity Data (Estimated), 4. US EPA, Ecotox database - Aquatic Toxicity Data, 5. ECETOC Aquatic Hazard Assessment Data, 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data, 8. Vendor Data.*

DO NOT discharge into sewer or waterways.

Inherently biodegradable Potential for bioaccumulation is low. Under aerobic conditions, PLA decomposes to lactic acid and other smaller compounds, ultimately to carbon dioxide and water. Under anaerobic conditions and an aqueous medium, PLA will decompose to lactic acid per se. The hydrolysis half-life of lactide at 25 deg C is 3.3 hours in neutral and aqueous media. Consequently, the concentration of lactide in leachate is expected to be converted entirely to lactic acid, a common food component with a long and safe history of use, under the multi-year time frames for land-filled materials. Algae IC50 (72 h): >1100 mg/l|.

Persistence and degradability:

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

Bioaccumulative potential:

Ingredient	Bioaccumulation
	No Data available for all ingredients

Mobility in soil:

Ingredient	Mobility
	No Data available for all ingredients

13. Disposal Considerations

Waste treatment methods:

Product / Packaging disposal	▸ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: - Reduction - Reuse - Recycling - Disposal (if all else fails) ▸ This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. ▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority.

14. Transport Information

Labels Required:

Marine Pollutant	NO
HAZCHEM	Not Applicable

Land transport (UN): Not regulated for transport of dangerous goods

Air transport (ICAO-IATA / DGR): Not regulated for transport of dangerous goods

Sea transport (IMDG-Code / GGVSee): Not regulated for transport of dangerous goods

15. Regulatory Information

Safety, Health and Environmental Regulation/ Legislation specific for the substance or mixture

POLYLACTIDE RESIN (9051-89-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS - Not Applicable

This safety data sheet is in compliance with the Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013 (CLASS).

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (polylactide resin)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (polylactide resin)
Japan - ENCS	N (polylactide resin)
Korea - KECI	N (polylactide resin)
New Zealand - NZIoC	Y
Philippines - PICCS	N (polylactide resin)
USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

16. Other Information

Other information:

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references. A list of reference resources used to assist the committee may be found at: www.chemwatch.net

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations:

PC－TWA	**:**	Permissible Concentration-Time Weighted Average PC
－STEL	**:**	Permissible Concentration-Short Term Exposure Limit
IARC	**:**	International Agency for Research on Cancer
ACGIH	**:**	American Conference of Governmental Industrial Hygienists
STEL	**:**	Short Term Exposure Limit
TEEL	**:**	Temporary Emergency Exposure Limit
IDLH	**:**	Immediately Dangerous to Life or Health Concentrations
OSF	**:**	Odour Safety Factor
NOAEL	**:**	No Observed Adverse Effect Level
LOAEL	**:**	Lowest Observed Adverse Effect Level
TLV	**:**	Threshold Limit Value
LOD	**:**	Limit Of Detection
OTV	**:**	Odour Threshold Value
BCF	**:**	BioConcentration Factors
BEI	**:**	Biological Exposure Index