SAFETY DATA SHEET

Xpandit

Section 1. Identification

GHS product identifier : Xpandit

Other means of identification : Not available.

Product type : Liquid.

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

Identified uses : Not available.

Supplier's details : Expansion Technologies, Inc.
One Kendall Square Bldg 400, suite 4401
Cambridge, MA 02139
Tel: (617) 225-7980
Email: Tami@extbio.com

Emergency telephone number (with hours of operation) : Nikita Obidin, 857-389-8471
9 a.m. to 5 p.m. Monday to Friday

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture :

Serum	Not classified.
Initiator	OXIDIZING SOLIDS - Category 3 ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A RESPIRATORY SENSITIZATION - Category 1 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 AQUATIC HAZARD (ACUTE) - Category 3 AQUATIC HAZARD (LONG-TERM) - Category 3
50x	Not classified.
Digestion buffer	Not classified.
Blocking Buffer	Not classified.
Hybridization buffer	SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A
Accelerator	FLAMMABLE LIQUIDS - Category 2 SKIN CORROSION - Category 1B SERIOUS EYE DAMAGE - Category 1
TUBE K	SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A RESPIRATORY SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
Monomer solution-tissue	SKIN SENSITIZATION - Category 1 GERM CELL MUTAGENICITY - Category 1 CARCINOGENICITY - Category 1B

Section 2. Hazards identification

		TOXIC TO REPRODUCTION (Fertility) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 AQUATIC HAZARD (ACUTE) - Category 2
	Monomer solution-cells	SKIN SENSITIZATION - Category 1 GERM CELL MUTAGENICITY - Category 1 CARCINOGENICITY - Category 1B TOXIC TO REPRODUCTION (Fertility) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 AQUATIC HAZARD (ACUTE) - Category 2
	IgG-DNA	Not classified.

GHS label elements

Hazard pictograms :

Signal word :	**Serum**	No signal word.
	Initiator	Danger
	50x	No signal word.
	Digestion buffer	No signal word.
	Blocking Buffer	No signal word.
	Hybridization buffer	Warning
	Accelerator	Danger
	TUBE K	Danger
	Monomer solution-tissue	Danger
	Monomer solution-cells	Danger
	IgG-DNA	No signal word.
Hazard statements :	**Serum**	No known significant effects or critical hazards.
	Initiator	May intensify fire; oxidizer. Harmful if swallowed. Causes serious eye irritation. Causes skin irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause respiratory irritation. Harmful to aquatic life with long lasting effects.
	50x	No known significant effects or critical hazards.
	Digestion buffer	No known significant effects or critical hazards.
	Blocking Buffer	No known significant effects or critical hazards.
	Hybridization buffer	Causes serious eye irritation. Causes skin irritation.
	Accelerator	Highly flammable liquid and vapor. Causes severe skin burns and eye damage.
	TUBE K	Causes serious eye irritation. Causes skin irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation.
	Monomer solution-tissue	May cause an allergic skin reaction. May cause genetic defects.

Section 2. Hazards identification

	May cause cancer. Suspected of damaging fertility. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life.
Monomer solution-cells	May cause an allergic skin reaction. May cause genetic defects. May cause cancer. Suspected of damaging fertility. Causes damage to organs through prolonged or repeated exposure. Toxic to aquatic life.
IgG-DNA	No known significant effects or critical hazards.

Precautionary statements

Prevention : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.
P284 - Wear respiratory protection.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P261 - Avoid breathing vapor.
P264 - Wash hands thoroughly after handling.
P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.

Response : P308 + P313 - IF exposed or concerned: Get medical attention.
P304 + P341 (OSHA) + P312 - IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or physician.
P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse.
P333 + P313 - If skin irritation or rash occurs: Get medical attention.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical attention.

Storage : P405 - Store locked up.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

CAS number : Not applicable.

Product code : Not available.

Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
Initiator		
Diammonium peroxodisulphate	90 - 100	7727-54-0
Digestion buffer		
Guanidinium chloride	≥5 - <10	50-01-1
Hybridization buffer		
Dextran, hydrogen sulfate, sodium salt	≥10 - <20	9011-18-1
Accelerator		
N,N,N',N'-tetramethylethylenediamine	≥10 - ≤20	110-18-9
TUBE K		
Proteinase, Tritirachium album serine	90 - 100	39450-01-6
Monomer solution-tissue		
Sodium acrylate	≥5 - ≤10	7446-81-3
Acrylamide	≥1 - ≤3	79-06-1
Monomer solution-cells		
Sodium acrylate	≥5 - ≤10	7446-81-3
Acrylamide	≥1 - ≤3	79-06-1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.

Skin contact : Wash with plenty of soap and water. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 20 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway.

Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	:	**Serum**	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
		Initiator	Causes serious eye irritation.
		50x	No known significant effects or critical hazards.
		Digestion buffer	No known significant effects or critical hazards.
		Blocking Buffer	No known significant effects or critical hazards.
		Hybridization buffer	Causes serious eye irritation.
		Accelerator	Causes serious eye damage.
		TUBE K	Causes serious eye irritation.
		Monomer solution-tissue	No known significant effects or critical hazards.
		Monomer solution-cells	No known significant effects or critical hazards.
		IgG-DNA	No known significant effects or critical hazards.
Inhalation	:	**Serum**	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.
		Initiator	May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
		50x	No known significant effects or critical hazards.
		Digestion buffer	No known significant effects or critical hazards.
		Blocking Buffer	No known significant effects or critical hazards.
		Hybridization buffer	No known significant effects or critical hazards.
		Accelerator	No known significant effects or critical hazards.
		TUBE K	May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
		Monomer solution-tissue	No known significant effects or critical hazards.
		Monomer solution-cells	No known significant effects or critical hazards.
		IgG-DNA	No known significant effects or critical hazards.
Skin contact	:	**Serum**	No known significant effects or critical hazards.
		Initiator	Causes skin irritation. May cause an allergic skin reaction.
		50x	No known significant effects or critical hazards.
		Digestion buffer	No known significant effects or critical hazards.
		Blocking Buffer	No known significant effects or critical hazards.
		Hybridization buffer	Causes skin irritation.
		Accelerator	Causes severe burns.
		TUBE K	Causes skin irritation.
		Monomer solution-tissue	May cause an allergic skin reaction.
		Monomer solution-cells	May cause an allergic skin reaction.
		IgG-DNA	No known significant effects or critical hazards.
Ingestion	:	**Serum**	No known significant effects or critical hazards.
		Initiator	Harmful if swallowed.
		50x	No known significant effects or critical hazards.
		Digestion buffer	No known significant effects or critical hazards.
		Blocking Buffer	No known significant effects or critical hazards.
		Hybridization buffer	No known significant effects or critical hazards.
		Accelerator	No known significant effects or critical hazards.
		TUBE K	No known significant effects or critical hazards.
		Monomer solution-tissue	No known significant effects or critical hazards.
		Monomer solution-cells	No known significant effects or critical hazards.

Section 4. First aid measures

IgG-DNA		No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : This material is harmful to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
halogenated compounds

Section 5. Fire-fighting measures

Special protective actions for fire-fighters : No special measures are required.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

Spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Initiator Diammonium peroxodisulphate	**ACGIH TLV (United States, 3/2015).** TWA: 0.1 mg/m³, (as persulfate) 8 hours.
Digestion buffer Guanidinium chloride	None.
Hybridization buffer Dextran, hydrogen sulfate, sodium salt	None.
Accelerator N,N,N',N'-tetramethylethylenediamine	None.
TUBE K Proteinase, Tritirachium album serine	None.
Monomer solution-tissue Sodium acrylate Acrylamide	None. **NIOSH REL (United States, 10/2013). Absorbed through skin.** TWA: 0.03 mg/m³ 10 hours. **ACGIH TLV (United States, 3/2015). Absorbed through skin.** TWA: 0.03 mg/m³ 8 hours. Form: Inhalable fraction and vapor **OSHA PEL (United States, 2/2013). Absorbed through skin.** TWA: 0.3 mg/m³ 8 hours.
Monomer solution-cells Sodium acrylate Acrylamide	None. **NIOSH REL (United States, 10/2013). Absorbed through skin.** TWA: 0.03 mg/m³ 10 hours. **ACGIH TLV (United States, 3/2015). Absorbed through skin.** TWA: 0.03 mg/m³ 8 hours. Form: Inhalable fraction and vapor **OSHA PEL (United States, 2/2013). Absorbed through skin.** TWA: 0.3 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 8. Exposure controls/personal protection

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state	**Serum**	Solid. [Powder.]
	Initiator	Solid. [Crystalline powder.]
	50x	Liquid. [Clear.]
	Digestion buffer	Liquid. [Clear.]
	Blocking Buffer	Liquid. [Clear.]
	Hybridization buffer	Liquid. [Clear.]
	Accelerator	Liquid. [Clear.]
	TUBE K	Solid. [Crystalline powder.]
	Monomer solution-tissue	Liquid. [Clear.]
	Monomer solution-cells	Liquid. [Clear.]
	IgG-DNA	Liquid. [Clear.]
Color	**Serum**	White.
	Initiator	White.
	50x	Blue, green, orange (depending on fluorophore).
	Digestion buffer	Clear.
	Blocking Buffer	Clear.
	Hybridization buffer	Clear.
	Accelerator	Clear.
	TUBE K	White.
	Monomer solution-tissue	Clear.
	Monomer solution-cells	Clear.
	IgG-DNA	Clear.
Odor	**Serum**	Odorless.
	Initiator	Odorless.
	50x	Odorless.
	Digestion buffer	Odorless.
	Blocking Buffer	Odorless.
	Hybridization buffer	Odorless.
	Accelerator	Not available.
	TUBE K	Odorless.
	Monomer solution-	Odorless.

Section 9. Physical and chemical properties

		tissue	
		Monomer solution-cells	Odorless.
		IgG-DNA	Odorless.
Odor threshold	:	Not available.	
pH	:	**Serum**	7.6 [Conc. (% w/w): 1%]
		Initiator	1 to 2 [Conc. (% w/w): 1%]
		50x	7.6
		Digestion buffer	Not available.
		Blocking Buffer	Not available.
		Hybridization buffer	Not available.
		Accelerator	Not available.
		TUBE K	Not available.
		Monomer solution-tissue	Not available.
		Monomer solution-cells	Not available.
		IgG-DNA	7.6 [Conc. (% w/w): 1%]
Melting point	:	Not available.	
Boiling point	:	Not available.	
Flash point	:	**Serum**	Not available.
		Initiator	Not available.
		50x	Not available.
		Digestion buffer	Not available.
		Blocking Buffer	Not available.
		Hybridization buffer	Not available.
		Accelerator	Closed cup: 20°C (68°F)
		TUBE K	Not available.
		Monomer solution-tissue	Not available.
		Monomer solution-cells	Not available.
		IgG-DNA	Not available.
Evaporation rate	:	Not available.	
Flammability (solid, gas)	:	Not available.	
Lower and upper explosive (flammable) limits	:	Not available.	
Vapor pressure	:	Not available.	
Vapor density	:	Not available.	
Relative density	:	Not available.	
Solubility	:	**Serum**	Soluble in water.
		Initiator	Soluble in water.
		50x	Not available.
		Digestion buffer	Not available.
		Blocking Buffer	Soluble in water.
		Hybridization buffer	Not available.
		Accelerator	Not available.
		TUBE K	Not available.
		Monomer solution-tissue	Soluble in water.
		Monomer solution-cells	Soluble in water.
		IgG-DNA	Soluble in water.
Partition coefficient: n-octanol/water	:	Not available.	
Auto-ignition temperature	:	Not available.	

Section 9. Physical and chemical properties

Decomposition temperature : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Not available.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Initiator				
Diammonium peroxodisulphate	LD50 Oral	Rat	689 mg/kg	-
Digestion buffer				
Guanidinium chloride	LD50 Oral	Rat	475 mg/kg	-
Hybridization buffer				
Dextran, hydrogen sulfate, sodium salt	LD50 Oral	Rat	20600 mg/kg	-
Accelerator				
N,N,N',N'-tetramethylethylenediamine	LC50 Inhalation Gas. LD50 Dermal LD50 Oral	Rat Rabbit Rat	1318 ppm 5390 mg/kg 268 mg/kg	4 hours - -
Monomer solution-tissue				
Acrylamide	LD50 Dermal LD50 Dermal LD50 Oral	Rabbit Rat Rat	1150 mg/kg 400 mg/kg 124 mg/kg	- - -
Monomer solution-cells				
Acrylamide	LD50 Dermal LD50 Dermal LD50 Oral	Rabbit Rat Rat	1150 mg/kg 400 mg/kg 124 mg/kg	- - -

Irritation/Corrosion

Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
Digestion buffer					
Guanidinium chloride	Eyes - Moderate irritant	Rabbit	-	81400 µg	-
	Skin - Severe irritant	Rabbit	-	24 hours 500 mg	-
Accelerator					
N,N,N',N'-tetramethylethylenediamine	Eyes - Severe irritant	Rabbit	-	750 µg	-
	Skin - Moderate irritant	Rabbit	-	0.5 mL	-
Monomer solution-tissue					
Acrylamide	Eyes - Mild irritant	Rabbit	-	10 %	-
	Eyes - Mild irritant	Rabbit	-	0.5 minutes 10 mg	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	72 hours 50 mg	-
Monomer solution-cells					
Acrylamide	Eyes - Mild irritant	Rabbit	-	10 %	-
	Eyes - Mild irritant	Rabbit	-	0.5 minutes 10 mg	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	72 hours 50 mg	-

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

Classification

Product/ingredient name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Monomer solution-tissue						
Acrylamide	-	2A	Reasonably anticipated to be a human carcinogen.	A3	-	+
Monomer solution-cells						
Acrylamide	-	2A	Reasonably anticipated to be a human carcinogen.	A3	-	+

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Initiator			
Diammonium peroxodisulphate	Category 3	Not applicable.	Respiratory tract irritation
Hybridization buffer			
Dextran, hydrogen sulfate, sodium salt	Category 3	Not applicable.	Respiratory tract irritation
TUBE K			
Proteinase, Tritirachium album serine	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
Monomer solution-tissue Acrylamide	Category 1	Not determined	Not determined
Monomer solution-cells Acrylamide	Category 1	Not determined	Not determined

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : May cause genetic defects.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : Suspected of damaging fertility.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Digestion buffer	
Oral	6785.7 mg/kg
Accelerator	
Oral	5000 mg/kg
Inhalation (gases)	45000 ppm
Monomer solution-tissue	
Oral	4960 mg/kg
Dermal	44000 mg/kg
Inhalation (dusts and mists)	60 mg/L
Monomer solution-cells	
Oral	4960 mg/kg
Dermal	44000 mg/kg
Inhalation (dusts and mists)	60 mg/L

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Initiator			
Diammonium peroxodisulphate	Acute LC50 170000 µg/L	Crustaceans - Cyclops strenuus	48 hours
	Acute LC50 87000 µg/L	Daphnia - Daphnia pulicaria	48 hours
Monomer solution-tissue			
Acrylamide	Acute EC50 98000 µg/L Fresh water	Daphnia - Daphnia magna - Instar	48 hours
	Acute EC50 85000 µg/L Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic NOEC 2.86 mg/L Fresh water	Fish - Pimephales promelas - Embryo	33 days
Monomer solution-cells			
Acrylamide	Acute EC50 98000 µg/L Fresh water	Daphnia - Daphnia magna - Instar	48 hours
	Acute EC50 85000 µg/L Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic NOEC 2.86 mg/L Fresh water	Fish - Pimephales promelas - Embryo	33 days

Persistence and degradability

There is no data available.

Bioaccumulative potential

Section 12. Ecological information

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Digestion buffer			
Guanidinium chloride	-1.7	-	low
Accelerator			
N,N,N',N'-tetramethylethylenediamine	0.3	-	low
Monomer solution-tissue			
Sodium acrylate	0.46	-	low
Acrylamide	-0.9	-	low
Monomer solution-cells			
Sodium acrylate	0.46	-	low
Acrylamide	-0.9	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Monomer solution-tissue			
Acrylamide	79-06-1	Listed	U007
Monomer solution-cells			
Acrylamide	79-06-1	Listed	U007

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	UN3316	UN3316	UN3316
UN proper shipping name	CHEMICAL KITS	CHEMICAL KITS	CHEMICAL KITS
Transport hazard class(es)	9 	9 	9 

Section 14. Transport information

Packing group	III	III	III
Environmental hazards	No.	No.	No.
Additional information	-	**Emergency schedules (EmS)** F-A, S-P	-

AERG : 171

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: Poly(oxy-1,2-ethanediyl), α-[4-(1,1,3,3-tetramethylbutyl)phenyl]-ω-hydroxy-; N,N,N',N'-tetramethylethylenediamine

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

United States inventory (TSCA 8b): Not determined.

Clean Water Act (CWA) 311: Disodium hydrogenorthophosphate

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ (lbs)	SARA 302 TPQ (gallons)	SARA 304 RQ (lbs)	SARA 304 RQ (gallons)
Monomer solution-tissue Acrylamide	≥1 - ≤3	Yes.	1000 / 10000	-	5000	-
Monomer solution-cells Acrylamide	≥1 - ≤3	Yes.	1000 / 10000	-	5000	-

SARA 304 RQ : 3469333.3 lbs / 1575077.3 kg

SARA 311/312

Classification : Immediate (acute) health hazard
Delayed (chronic) health hazard

Composition/information on ingredients

Section 15. Regulatory information

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Initiator Diammonium peroxodisulphate	90 - 100	Yes.	No.	No.	Yes.	No.
Digestion buffer Guanidinium chloride	≥5 - <10	No.	No.	No.	Yes.	No.
Hybridization buffer Dextran, hydrogen sulfate, sodium salt	≥10 - <20	No.	No.	No.	Yes.	No.
Accelerator N,N,N',N'-tetramethylethylenediamine	≥10 - ≤20	Yes.	No.	No.	Yes.	No.
TUBE K Proteinase, Tritirachium album serine	90 - 100	No.	No.	No.	Yes.	No.
Monomer solution-tissue Acrylamide	≥1 - ≤3	No.	No.	No.	Yes.	Yes.
Monomer solution-cells Acrylamide	≥1 - ≤3	No.	No.	No.	Yes.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	**Initiator** Diammonium peroxodisulphate	7727-54-0	90 - 100
	Monomer solution-tissue Acrylamide	79-06-1	≥1 - ≤3
	Monomer solution-cells Acrylamide	79-06-1	≥1 - ≤3
Supplier notification	**Initiator** Diammonium peroxodisulphate	7727-54-0	90 - 100
	Monomer solution-tissue Acrylamide	79-06-1	≥1 - ≤3
	Monomer solution-cells Acrylamide	79-06-1	≥1 - ≤3

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

There is no data available.

State regulations

Massachusetts : None of the components are listed.

New York : The following components are listed: Acrylamide

New Jersey : The following components are listed: Diammonium peroxodisulphate; Acrylamide

Pennsylvania : The following components are listed: Acrylamide

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Section 15. Regulatory information

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Monomer solution-tissue				
Acrylamide	Yes.	Yes.	Yes.	Yes.
Monomer solution-cells				
Acrylamide	Yes.	Yes.	Yes.	Yes.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
Initiator	
OXIDIZING SOLIDS - Category 3	Expert judgment
ACUTE TOXICITY (oral) - Category 4	Expert judgment
SKIN IRRITATION - Category 2	Expert judgment
EYE IRRITATION - Category 2A	Expert judgment
RESPIRATORY SENSITIZATION - Category 1	Expert judgment
SKIN SENSITIZATION - Category 1	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Expert judgment
AQUATIC HAZARD (ACUTE) - Category 3	Expert judgment
AQUATIC HAZARD (LONG-TERM) - Category 3	Expert judgment
Hybridization buffer	
SKIN IRRITATION - Category 2	Calculation method
EYE IRRITATION - Category 2A	Calculation method
Accelerator	
FLAMMABLE LIQUIDS - Category 2	On basis of test data
SKIN CORROSION - Category 1B	Calculation method
SERIOUS EYE DAMAGE - Category 1	Calculation method
TUBE K	
SKIN IRRITATION - Category 2	Expert judgment
EYE IRRITATION - Category 2A	Expert judgment
RESPIRATORY SENSITIZATION - Category 1	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Expert judgment
Monomer solution-tissue	
SKIN SENSITIZATION - Category 1	Calculation method
GERM CELL MUTAGENICITY - Category 1	Calculation method
CARCINOGENICITY - Category 1B	Calculation method
TOXIC TO REPRODUCTION (Fertility) - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1	Calculation method
AQUATIC HAZARD (ACUTE) - Category 2	Calculation method
Monomer solution-cells	
SKIN SENSITIZATION - Category 1	Calculation method
GERM CELL MUTAGENICITY - Category 1	Calculation method
CARCINOGENICITY - Category 1B	Calculation method
TOXIC TO REPRODUCTION (Fertility) - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1	Calculation method
AQUATIC HAZARD (ACUTE) - Category 2	Calculation method

History

Section 16. Other information

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Prepared by : KMK Regulatory Services Inc.

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