

**SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING****Product Identifier**

Product name	PVC HEAT SHRINK TUBING, FILM
Chemical Name	polyvinyl chloride
Synonyms	Not Available
Chemical formula	(C <sub>2</sub> H <sub>3</sub> Cl) <sub>x</sub>
Other means of identification	Not Available
CAS number	9002-86-2

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

Relevant identified uses	Packing material
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**Details of the manufacturer/importer**

Ratermann Manufacturing, Inc.  
601 Pinnacle Place  
Livermore, CA 94550

Telephone Number: 800-264-7793

**SECTION 2 HAZARDS IDENTIFICATION****Classification of the substance or mixture**

GHS Classification	Skin Sensitizer Category 1, Reproductive Toxicity Category 2, STOT - RE Category 1
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**Label elements**

GHS label elements	
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SIGNAL WORD	DANGER
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**Hazard statement(s)**

H317	May cause an allergic skin reaction
H361	Suspected of damaging fertility or the unborn child
H372	Causes damage to organs through prolonged or repeated exposure

**Precautionary statement(s) Prevention**

P201	Obtain special instructions before use.
P260	Do not breathe dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P281	Use personal protective equipment as required.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.

#### Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/attention.
P363	Wash contaminated clothing before reuse.
P302+P352	IF ON SKIN: Wash with plenty of water and soap.
P314	Get medical advice/attention if you feel unwell.
P333+P313	IF skin irritation or rash occurs: Get medical advice/attention.

#### Precautionary statement(s) Storage

P405	Store locked up.
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#### Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration.
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### SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

#### Substances

CAS No	%[weight]	Name
9002-86-2	96	<u>PVC</u>
13463-67-7	1-2	<u>Titanium dioxide</u>
6422-86-2	0.5-1	<u>dioctyl sebacate</u>
57583-34-3	0.5-1	<u>methyltris(2-ethylhexyl thiocarbonate)</u>
57583-35-4	0.5-1	<u>dimethylbis(2-ethylhexyl thiocarbonate)</u>
25852-37-3	0.5	<u>methyl methacrylate/butyl acrylate copolymer</u>
25053-09-2	0.5	<u>styrene/butadiene/methyl methacrylate copolymer</u>

#### Mixtures

See section above for composition of Substances

### SECTION 4 FIRST AID MEASURES

#### Description of first aid measures

Eye Contact	<p>If this product comes in contact with eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with water.</li> <li>▶ If irritation continues, seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
Skin Contact	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Immediately remove all contaminated clothing, including footwear.</li> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
Inhalation	<ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>
Ingestion	<ul style="list-style-type: none"> <li>▶ Immediately give a glass of water.</li> <li>▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>

#### Most important symptoms and effects, both acute and delayed

See Section 11

#### Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

### SECTION 5 FIREFIGHTING MEASURES

#### Extinguishing media

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

**Special hazards arising from the substrate or mixture**

<b>Fire incompatibility</b>	None known.
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**Advice for firefighters**

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Use fire fighting procedures suitable for surrounding area.</li> <li>▶ DO NOT approach containers suspected to be hot.</li> <li>▶ Cool fire exposed containers with water spray from a protected location.</li> <li>▶ If safe to do so, remove containers from path of fire.</li> <li>▶ Equipment should be thoroughly decontaminated after use.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered a significant fire risk, however containers may burn.</li> </ul> <p>May emit corrosive fumes.</p>

**SECTION 6 ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing dust and contact with skin and eyes.</li> <li>▶ Wear protective clothing, gloves, safety glasses and dust respirator.</li> <li>▶ Use dry clean up procedures and avoid generating dust.</li> <li>▶ Sweep up, shovel up or</li> <li>▶ Vacuum up (consider explosion-proof machines designed to be grounded during storage and use)</li> <li>▶ Place spilled material in clean, dry, sealable, labelled container.</li> </ul>
<b>Major Spills</b>	<p>Moderate hazard.</p> <ul style="list-style-type: none"> <li>▶ CAUTION. Advise personnel in area.</li> <li>▶ Alert Emergency Services and tell them location and nature of hazard.</li> <li>▶ Control personal contact by wearing protective clothing.</li> <li>▶ Prevent, by any means available, spillage from entering drains or water courses.</li> <li>▶ Recover product wherever possible.</li> <li>▶ IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET: Vacuum/shovel up and place in labelled containers for disposal.</li> <li>▶ ALWAYS: Wash area down with large amounts of water and prevent runoff into drains.</li> <li>▶ If contamination of drains or waterways occurs, advise Emergency Services.</li> </ul> <p>Personal Protective Equipment advice is contained in Section 8 of the MSDS.</p>

**SECTION 7 HANDLING AND STORAGE**

**Precautions for safe handling**

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Use in a well-ventilated area.</li> <li>▶ Prevent concentration in hotspots and sumps.</li> <li>▶ DO NOT enter confined spaces until atmosphere has been checked.</li> <li>▶ DO NOT allow material to contact humans, exposed food or food utensils.</li> <li>▶ Avoid contact with incompatible materials.</li> <li>▶ When handling, DO NOT eat, drink or smoke.</li> <li>▶ Keep containers securely sealed when not in use.</li> <li>▶ Avoid physical damage to containers.</li> <li>▶ Always wash hands with soap and water after handling.</li> <li>▶ Work clothes should be laundered separately. Launder contaminated clothing before re-use.</li> <li>▶ Use good occupational work practice.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this MSDS.</li> <li>▶ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</li> </ul>
<b>Other Information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> <li>▶ Store in a cool, dry area protected from environmental extremes.</li> <li>▶ Store away from incompatible materials and foodstuff containers.</li> <li>▶ Protect containers against physical damage and check regularly for leaks.</li> <li>▶ Observe manufacturer's storage and handling recommendations contained within this MSDS.</li> </ul> <p>For major quantities:</p> <ul style="list-style-type: none"> <li>▶ Consider storage in bunded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams).</li> <li>▶ Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.</li> </ul>

**Conditions for safe storage, including any incompatibilities**

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ PVC.</li> <li>▶ Lined metal can, lined metal pail/ can.</li> <li>▶ Plastic pail.</li> <li>▶ Polyliner drum.</li> <li>▶ Packing as recommended by manufacturer.</li> </ul>
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Storage incompatibility	▶ Check all containers are clearly labelled and free from leaks.
	Phthalates:
	▶ react with strong acids, strong oxidisers, permanganates and nitrates
	▶ attack some form of plastics
	None known

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US ACGIH Threshold Limit Values (TLV)	PVC	Polyvinyl chloride	1 mg/m <sup>3</sup>	Not Available	Not Available	TLV® Basis: Pneumoconiosis; LRT irr; pulm func changes
US OSHA Permissible Exposure Levels (PELs) - Table Z1	titanium dioxide	Titanium dioxide	15 mg/m <sup>3</sup>	Not Available	Not Available	Total dust
US ACGIH Threshold Limit Values (TLV)	titanium dioxide	Titanium dioxide	10 mg/m <sup>3</sup>	Not Available	Not Available	TLV® Basis: LRT irr
US NIOSH Recommended Exposure Limits (RELs)	titanium dioxide	Rutile, Titanium oxide, Titanium peroxide	Not Available	Not Available	Not Available	Ca See Appendix A
US OSHA Permissible Exposure Levels (PELs) - Table Z3	diethyl terephthalate	Inert or Nuisance Dust	5 mg/m <sup>3</sup> / 15 mppcf / 15 mppcf / 50 mppcf	Not Available	Not Available	Respirable fraction; All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1. / Total dust; All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.
US OSHA Permissible Exposure Levels (PELs) - Table Z1	methyltin tris(2-ethylhexyl thioglycolate)	Tin, organic compounds	0.1 mg/m <sup>3</sup>	Not Available	Not Available	(as Sn)
US ACGIH Threshold Limit Values (TLV)	methyltin tris(2-ethylhexyl thioglycolate)	Tin, organic compounds, as Sn	0.1 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	Not Available	TLV® Basis: Eye & URT irr; headache; nausea; CNS & immune eff
US OSHA Permissible Exposure Levels (PELs) - Table Z1	dimethyltin bis(2-ethylhexyl thioglycolate)	Tin, organic compounds	0.1 mg/m <sup>3</sup>	Not Available	Not Available	(as Sn)
US ACGIH Threshold Limit Values (TLV)	dimethyltin bis(2-ethylhexyl thioglycolate)	Tin, organic compounds, as Sn	0.1 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	Not Available	TLV® Basis: Eye & URT irr; headache; nausea; CNS & immune eff
US OSHA Permissible Exposure Levels (PELs) - Table Z3	styrene/ butadiene/ methyl methacrylate copolymer	Inert or Nuisance Dust	5 mg/m <sup>3</sup> / 15 mg/m <sup>3</sup> / 15 mppcf / 50 mppcf	Not Available	Not Available	Respirable fraction; All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1. / Total dust; All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.

#### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
PVC	Polyvinyl chloride	3 mg/m <sup>3</sup>	33 mg/m <sup>3</sup>	200 mg/m <sup>3</sup>
titanium dioxide	Titanium oxide; (Titanium dioxide)	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>
diethyl terephthalate	Particulate material (PNOS)	30 mg/m <sup>3</sup>	300 mg/m <sup>3</sup>	2000 mg/m <sup>3</sup>
styrene/ butadiene/ methyl methacrylate copolymer	Particulate material (PNOS)	30 mg/m <sup>3</sup>	300 mg/m <sup>3</sup>	2000 mg/m <sup>3</sup>

Ingredient	Original IDLH	Revised IDLH
PVC	Not Available	Not Available
titanium dioxide	N.E. mg/m <sup>3</sup> / N.E. ppm	5,000 mg/m <sup>3</sup>
diethyl terephthalate	Not Available	Not Available
methyltin tris(2-ethylhexyl thioglycolate)	Unknown mg/m <sup>3</sup> / Unknown ppm	25 mg/m <sup>3</sup>
dimethyltin bis(2-ethylhexyl thioglycolate)	Unknown mg/m <sup>3</sup> / Unknown ppm	25 mg/m <sup>3</sup>
methyl methacrylate/ butyl acrylate copolymer	Not Available	Not Available

styrene/butadiene/ methyl methacrylate copolymer

Not Available

Not Available

## Exposure controls

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.

Employers may need to use multiple types of controls to prevent employee overexposure.

▶ Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

▶ If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Such protection might consist of:

(a): particle dust respirators, if necessary, combined with an absorption cartridge;

(b): filter respirators with absorption cartridge or canister of the right type;

(c): fresh-air hoods or masks.

Air contaminants generated in the workplace possess varying 'escape' velocities which, in turn, determine the 'capture velocities' of fresh circulating air required to effectively remove the contaminant.

### Appropriate engineering controls

Type of Contaminant:

Air Speed

direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)

1-2.5 m/s (200-500 f/min)

grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

2.5-10 m/s (500-2000 f/min)

Within each range the appropriate value depends on:

Lower end of the range

Upper end of the range

1: Room air currents minimal or favourable to capture

1: Disturbing room air currents

2: Contaminants of low toxicity or of nuisance value only

2: Contaminants of high toxicity

3: Intermittent, low production

3: High production, heavy use

4: Large hood or large air mass in motion

4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 metres distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

### 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. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 58], [AS/NZS 1336 or national equivalent]

### Skin protection

See Hand protection below

#### NOTE:

▶ The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

▶ Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

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 can not be calculated in advance and has therefore to be checked prior to the application.

The exact breakthrough 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

### Hands/feet protection

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 only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.

▶ Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.

▶ Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not

	<p>present</p> <ul style="list-style-type: none"> <li>▶ polychloroprene.</li> <li>▶ nitrile rubber.</li> <li>▶ butyl rubber.</li> <li>▶ fluorocautchouc.</li> <li>▶ polyvinyl chloride.</li> </ul> <p>Gloves should be examined for wear and/ or degradation constantly.</p>
Body protection	See Other protection below
Other protection	<ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C. apron.</li> <li>▶ Barrier cream.</li> <li>▶ Skin cleansing cream.</li> <li>▶ Eye wash unit.</li> </ul>
Thermal hazards	Not Available

#### Recommended material(s)

##### GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:  
"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:

PVC HEAT SHRINK TUBING, FILM Not Available

Material	CPI
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\* CPI - Chemweld Performance Index

A: Best Selection

B: Satisfactory, may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

\* Where the glove is to be used on a short term, casual or infrequent basis, factors such as 'feel' or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

#### Respiratory protection

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

### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

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

### SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	Product is considered stable and 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

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.  Thioglycolate salts may produce decreased blood sugar levels, central nervous system depression, laboured breathing, and convulsions. The material has NOT been classified by EC Directives or other classification systems as 'harmful by ingestion'. This is because of the lack of corroborating animal or human evidence.
Ingestion	The toxicity of phthalates is not excessive due to slow oral absorption and metabolism. Absorption is affected by fat in the diet. Repeated doses can cause cumulative toxic effects, and symptoms include an enlarged liver which often reverses if exposure is maintained. Carbohydrate metabolism is disrupted, and cholesterol and triglyceride levels in the blood falls. In rats, there is also strong evidence of withering of the testicles. Some phthalates can increase the effects of antibiotics, thiamine (vitamin B1) and sulfonamides.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Fatalities were produced by topical application of a 10% solution of thioglycolic acid to guinea pigs at less than 5 ml/kg. Signs of intoxication included weakness, gasping and convulsions. Professional hair-dressers exposed to thioglycolate products show skin irritation and skin sensitisation.
Eye	Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.
Chronic	Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population. Harmful: danger of serious damage to health by prolonged exposure if swallowed. This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. Chronic occupational exposure to thioglycolate salts has produced allergic reactions such as collection of fluid under the skin, burning of the skin, reddening and haemorrhage under skin surface, eczema like dermatitis of the scalp or hands and bleeding under the skin. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

dioctyl terephthalate	TOXICITY	IRRITATION
	Dermal (guinea pig) LD50: >19.68 mg/kg <sup>[2]</sup>	[Eastman]
	Oral (mouse) LD50: >3200 mg/kg <sup>[2]</sup>	Eye (rabbit): slight
	Oral (rat) LD50: >5000 mg/kg <sup>[2]</sup>	Skin (g. pig): slight
methyltin tris(2-ethylhexyl thioglycolate)	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 1000 mg/kg <sup>[1]</sup>	Not Available
	Oral (rat) LD50: 880 mg/kg <sup>[1]</sup>	
dimethyltin bis(2-ethylhexyl thioglycolate)	TOXICITY	IRRITATION
	Not Available	Not Available
methyl methacrylate/ butyl acrylate copolymer	TOXICITY	IRRITATION
	dermal (rat) LD50: >5000 mg/kg <sup>[2]</sup>	* [Rohm & Haas]
	Oral (rat) LD50: >5000 mg/kg <sup>[2]</sup>	
styrene/ butadiene/ methyl methacrylate copolymer	TOXICITY	IRRITATION
	Oral (rat) LD50: >5000 mg/kg <sup>[2]</sup>	Eye (rabbit): 500 mg/24h - mild
		Skin (rabbit): slight *
<b>Legend:</b>	1 Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's MSDS Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

PVC HEAT SHRINK TUBING, FILM	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. No significant acute toxicological data identified in literature search. Ammonium glyceryl thioglycolate and thioglycolic acid, used in cosmetic permanent waving lotions, are slightly toxic in acute single oral and skin exposures, and more so on extended exposure. They cause eye redness, low blood sugar, thyroid effects as well as airway skin and eye damage in animals. They cause maternal and foetal toxicity in experimental animals but lacks sufficient data for a substantive proof.
dioctyl terephthalate	The material may produce peroxisome proliferation. Peroxisomes are single, membrane limited organelles in the cytoplasm that are found in the cells of animals, plants, fungi, and protozoa. Tests reveal that terephthalic acid has low levels of toxicity when swallowed, inhaled or on skin contact. Animal testing shows that it causes mild airway irritation, and causes inflammation and stones in the bladder, with tumours appearing on chronic exposure. It is unlikely that humans would ingest enough terephthalic acid to cause bladder stones. Terephthalic acid does not cause reproductive toxicity, or genetic damage.

**METHYLITIN TRIS(2-ETHYLHEXYL THIOGLYCOLATE)**

The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. Ammonium glyceryl thioglycolate and thioglycolic acid, used in cosmetic permanent waving lotions, are slightly toxic in acute single oral and skin exposures, and more so on extended exposure. They cause eye redness, low blood sugar, thyroid effects as well as airway, skin and eye damage in animals. They cause maternal and foetal toxicity in experimental animals but lacks sufficient data for a substantive proof.

**dimethyltin bis(2-ethylhexyl thioglycolate)**

The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested. Ammonium glyceryl thioglycolate and thioglycolic acid, used in cosmetic permanent waving lotions, are slightly toxic in acute single oral and skin exposures, and more so on extended exposure. They cause eye redness, low blood sugar, thyroid effects as well as airway, skin and eye damage in animals. They cause maternal and foetal toxicity in experimental animals but lacks sufficient data for a substantive proof. No significant acute toxicological data identified in literature search.

**styrene/ butadiene/ methyl methacrylate copolymer**

The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing. for material of similar composition: Dermal (rabbit): >5000 mg/kg \* Eye (rabbit): slight \* Inhalation (rat) LC50: Dust generated at a maximum concentration of 1.84 mg/l was not fatal to test animals. \* Rohm and Haas MSDS for styrene/ butadiene copolymer

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: ✓ - Data required to make classification available  
 ✗ - Data available but does not fill the criteria for classification  
 ☹ - Data Not Available to make classification

**SECTION 12 ECOLOGICAL INFORMATION**

**Toxicity**

**Persistence and degradability**

Ingredient	Persistence: Water/Soil	Persistence: Air
PVC	LOW	LOW
titanium dioxide	HIGH	HIGH
diocyl terephthalate	LOW	LOW

**Bioaccumulative potential**

Ingredient	Bioaccumulation
PVC	LOW (LogKOW = 1.6233)
titanium dioxide	LOW (BCF = 10)
diocyl terephthalate	LOW (LogKOW = 8.3918)

**Mobility in soil**

Ingredient	Mobility
PVC	LOW (KOC = 23.74)
titanium dioxide	LOW (KOC = 23.74)
diocyl terephthalate	LOW (KOC = 162100)

**SECTION 13 DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

Product / Packaging disposal	<ul style="list-style-type: none"> <li>Containers may still present a chemical hazard/ danger when empty.</li> <li>Return to supplier for reuse/ recycling if possible.</li> </ul>
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Otherwise:

- ▶ If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- ▶ Where possible retain label warnings and MSDS and observe all notices pertaining to the product.
- ▶ Recycle wherever possible or consult manufacturer for recycling options.
- ▶ Consult State Land Waste Management Authority for disposal.
- ▶ Bury residue in an authorised landfill.
- ▶ Recycle containers if possible, or dispose of in an authorised landfill.

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

Marine Pollutant NO

Land transport (DOT): 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

Transport in bulk according to Annex II of MARPOL 73 / 78 and the IBC code

Source	Ingredient	Pollution Category
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried In Bulk	titanium dioxide	Z

## SECTION 15 REGULATORY INFORMATION

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

### PVC(9002-86-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

US - Hawaii Air Contaminant Limits

US ACGIH Threshold Limit Values (TLV)

US ACGIH Threshold Limit Values (TLV) - Carcinogens

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

### TITANIUM DIOXIDE(13463-67-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

US - Alaska Limits for Air Contaminants

US - California Permissible Exposure Limits for Chemical Contaminants

US - California Proposition 65 - Carcinogens

US - Hawaii Air Contaminant Limits

US - Idaho - Limits for Air Contaminants

US - Michigan Exposure Limits for Air Contaminants

US - Minnesota Permissible Exposure Limits (PELs)

US - Oregon Permissible Exposure Limits (Z-1)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants

US - Washington Permissible exposure limits of air contaminants

US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants

US ACGIH Threshold Limit Values (TLV)

US ACGIH Threshold Limit Values (TLV) - Carcinogens

US NIOSH Recommended Exposure Limits (RELs)

US OSHA Permissible Exposure Levels (PELs) - Table Z1

US Priority List for the Development of Proposition 65 Safe Harbor Levels - No Significant Risk Levels (NSRLs) for Carcinogens and Maximum Allowable Dose Levels (MADLs) for Chemicals Causing Reproductive Toxicity

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

### DIOCTYL TEREPHTHALATE(6422-88-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)

US - California Permissible Exposure Limits for Chemical Contaminants

US - Hawaii Air Contaminant Limits

US - Michigan Exposure Limits for Air Contaminants

US - Oregon Permissible Exposure Limits (Z-1)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

US - Washington Permissible exposure limits of air contaminants

US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants

US OSHA Permissible Exposure Levels (PELs) - Table Z3

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

### METHYL TIN TRIS(2-ETHYLHEXYL THIOGLYCOLATE)(57583-34-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants

US - California Permissible Exposure Limits for Chemical Contaminants

US - Hawaii Air Contaminant Limits

US - Idaho - Limits for Air Contaminants

US - Michigan Exposure Limits for Air Contaminants

US - Minnesota Permissible Exposure Limits (PELs)

US - Oregon Permissible Exposure Limits (Z-1)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants

US - Washington Permissible exposure limits of air contaminants

US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants

US ACGIH Threshold Limit Values (TLV)

US ACGIH Threshold Limit Values (TLV) - Carcinogens

US OSHA Permissible Exposure Levels (PELs) - Table Z1

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

### DIMETHYL TIN BIS(2-ETHYLHEXYL THIOGLYCOLATE)(57583-35-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants  
 US - California Permissible Exposure Limits for Chemical Contaminants  
 US - Hawaii Air Contaminant Limits  
 US - Idaho - Limits for Air Contaminants  
 US - Michigan Exposure Limits for Air Contaminants  
 US - Minnesota Permissible Exposure Limits (PELs)  
 US - Oregon Permissible Exposure Limits (Z-1)  
 US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants  
 US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants  
 US - Washington Permissible exposure limits of air contaminants  
 US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants  
 US ACGIH Threshold Limit Values (TLV)  
 US ACGIH Threshold Limit Values (TLV) - Carcinogens  
 US OSHA Permissible Exposure Levels (PELs) - Table Z1  
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**METHYL METHACRYLATE/ BUTYL ACRYLATE COPOLYMER(25852-37-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**STYRENE/ BUTADIENE/ METHYL METHACRYLATE COPOLYMER(25053-09-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs  
 US - California CEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)  
 US - California Permissible Exposure Limits for Chemical Contaminants  
 US - Hawaii Air Contaminant Limits  
 US - Michigan Exposure Limits for Air Contaminants  
 US - Oregon Permissible Exposure Limits (Z-1)

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants  
 US - Washington Permissible exposure limits of air contaminants  
 US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants  
 US OSHA Permissible Exposure Levels (PELs) - Table Z3  
 US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

**National Inventory**

**Status**

Australia - AICS	Y
Canada - DSL	Y
Canada - NDCL	N (styrene/ butadiene/ methyl methacrylate copolymer; methyl tris(2-ethylhexyl thioglycolate); PVC; titanium dioxide, dimethyltin bis(2-ethylhexyl thioglycolate); dioctyl terephthalate, methyl methacrylate/ butyl acrylate copolymer)
China - IECCS	Y
Europe - EINEC / ELINCS / NLP	N (styrene/ butadiene/ methyl methacrylate copolymer; PVC; methyl methacrylate/ butyl acrylate copolymer)
Japan - ENCS	N (methyltin tris(2-ethylhexyl thioglycolate); dimethyltin bis(2-ethylhexyl thioglycolate))
Korea - KECl	N (methyltin tris(2-ethylhexyl thioglycolate); dimethyltin bis(2-ethylhexyl thioglycolate))
New Zealand - NZbC	Y
Philippines - PICCS	Y
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)

**SECTION 16 OTHER INFORMATION**

**Other information**

The (M)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.