



Safety Data Sheet (SDS)

Applicant: Zhenjiang Flashforge 3D Technology Co.,Ltd.

Address: No.518,Xianyuan Road,Wucheng District ,Jinhua City,
Zhejiang Province.

Sample Name: ESD ABS





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According to GHS

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

1.1 Product Identifier

| | |
|---------------|-----------------------------------------------------------------------------------|
| Product name | ESD ABS |
| Company LOGO: |  |

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

| | |
|--------------------------|----------------------|
| Relevant identified uses | 3D printing supplies |
|--------------------------|----------------------|

1.3 Details of the supplier of the safety data sheet

| | |
|----------------------|-----------------------------------------------------------------------|
| Manufacture/Supplier | Zhenjiang Flashforge 3D Technology Co.,Ltd. |
| Address | No.518,Xianyuan Road,Wucheng District ,Jinhua City,Zhejiang Province. |
| Telephone | 18157957275 |
| Fax | -- |
| Email | 184021419@qq.com |
| Export to | GHS |
| Transport fashion | Air, sea, rail, highway |

1.4 Emergency telephone number

| | |
|-----------------------------|---------------|
| Emergency telephone numbers | 0579-89007351 |
|-----------------------------|---------------|

SECTION 2 Hazards identification

2.1 Classification of the substance or mixture

Summary of Hazard in an Emergency Situation

Solid. Does not mix with water. Sinks in water.Combustible.

May cause long-term adverse effects in the environment.Use appropriate container to avoid environmental contamination.

Avoid release to the environment. Refer to special instructions/Safety data sheets.





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|-----------------------|----------------|
| Classification | Not Applicable |
|-----------------------|----------------|

2.2 Label elements

| | |
|----------------------------|----------------|
| Hazard pictogram(s) | Not Applicable |
|----------------------------|----------------|

| | |
|--------------------|----------------|
| Signal word | Not Applicable |
|--------------------|----------------|

Hazard statement(s)

Not Applicable

Precautionary statement(s) Prevention

Not Applicable

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

Not Applicable

Physical and Chemical Hazard

Solid. Does not mix with water. Sinks in water. Combustible.

Toxic smoke/fumes in a fire. Dispose of this material and its container at hazardous or special waste collection point.

Health Hazards

| | |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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. |
| Ingestion | The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". |
| Skin Contact | The material is not thought to produce adverse health effects or skin irritation following contact |
| Eye | The material is not thought to be an irritant |
| Chronic | There is limited evidence that, skin contact with this product is more likely to cause a sensitisation reaction in some persons compared to the general population. |

Environmental Hazards

See Section 12

2.3 Other hazards

Not Applicable





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SECTION 3 Composition / information on ingredients

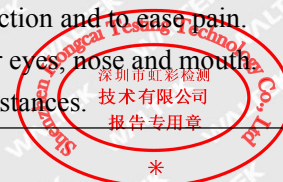
Substances/Mixtures

| Ingredient Name | CAS No. | EC No. | Content (%) |
|------------------|-------------|-----------|-------------|
| ABS | 9003-56-9 | 618-371-8 | >75% |
| Carbon nanotubes | 308068-56-6 | 608-533-6 | <10% |
| Toughening agent | 25053-09-2 | 607-511-3 | >10% |
| Other | -- | -- | <5% |

SECTION 4 First aid measures

4.1 Description of first aid measures

| | |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eye Contact | <p>If this product comes in contact with eyes: Wash out immediately with water. If irritation continues, 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.</p> |
| Skin Contact | <p>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.</p> |



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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.





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| | <p>For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway.</p> <p>Have a person with a facial burn sit up.</p> <p>Check pulse and breathing to monitor for shock until emergency help arrives.</p> |
| Inhalation | <p>If dust is inhaled, remove from contaminated area.</p> <p>Encourage patient to blow nose to ensure clear passage of breathing.</p> <p>If irritation or discomfort persists seek medical attention.</p> |
| Ingestion | <p>Immediately give a glass of water.</p> <p>First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</p> |

4.2 Most important symptoms and effects, both acute and delayed

This product is not classified as harmful to human health.

4.3 Indication of any immediate medical attention and special treatment needed

If skin irritation or rash occurs, consult a doctor.

SECTION 5 Firefighting measures

5.1 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.

5.2 Special hazards arising from the substrate or mixture

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| Fire Incompatibility | Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result |
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5.3 Advice for firefighters

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| Fire Fighting | <p>Alert Fire Brigade and tell them location and nature of hazard.</p> <p>Wear breathing apparatus plus protective gloves.</p> <p>Prevent, by any means available, spillage from entering drains or water courses.</p> <p>Use water delivered as a fine spray to control fire and cool adjacent area.</p> <p>DO NOT approach containers suspected to be hot.</p> |
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| | <p>Cool fire exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire. Equipment should be thoroughly decontaminated after use.</p> |
| <p>Fire/Explosion Hazard</p> | <p>Once acrylic fibre is ignited, an exothermic reaction can occur in the absence of oxygen with evolution of hazardous materials.</p> <p>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.</p> <p>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).</p> <p>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.</p> <p>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).</p> <p>When processed with flammable liquids/vapors/mists,ignitable (hybrid) mixtures may be formed with combustible dusts. Ignitable mixtures will increase the rate of explosion pressure rise and the Minimum Ignition Energy (the minimum amount of energy required to ignite dust clouds - MIE) will be lower than the pure dust in air mixture. The Lower Explosive Limit (LEL) of the vapour/dust mixture will be lower than the individual LELs for the vapors/mists or dusts.</p> <p>A dust explosion may release of large quantities of gaseous products; this in turn creates a subsequent pressure rise of explosive force capable of damaging plant and buildings and injuring people.</p> <p>Usually the initial or primary explosion takes place in a confined space such as plant or machinery, and can be of sufficient force to damage or rupture the plant. If the shock wave from the primary explosion enters the surrounding area, it will disturb any settled dust layers, forming a second dust cloud, and often initiate a much larger secondary explosion. All large scale explosions have resulted from chain reactions of this type.</p> <p>Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.</p> |



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Build-up of electrostatic charge may be prevented by bonding and grounding.
Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
All movable parts coming in contact with this material should have a speed of less than 1-meter/sec.
A sudden release of statically charged materials from storage or process equipment, particularly at elevated temperatures and/ or pressure, may result in ignition especially in the absence of an apparent ignition source.
One important effect of the particulate nature of powders is that the surface area and surface structure (and often moisture content) can vary widely from sample to sample, depending of how the powder was manufactured and handled; this means that it is virtually impossible to use flammability data published in the literature for dusts (in contrast to that published for gases and vapours).
Autoignition temperatures are often quoted for dust clouds (minimum ignition temperature (MIT)) and dust layers (layer ignition temperature (LIT)); LIT generally falls as the thickness of the layer increases.
Combustion products include:
carbon monoxide (CO)
carbon dioxide (CO₂)
nitrogen oxides (NO_x)
other pyrolysis products typical of burning organic material.
NOTE: Burns with intense heat. Produces melting, flowing, burning liquid and dense acid black smoke.
May 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.

SECTION 6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

See section 8

Measures for Preventing Secondary Contamination

Refer to section above

6.2 Environmental precautions

See section 12

6.3 Methods and material for containment and cleaning up





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| Minor Spills | Clean up all. |
| Major Spills | Clean up all. |

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

6.4 Reference to other sections

For information on safe operation, see section 7.

For information on personal protective equipment, see section 8.

SECTION 7 Handling and storage

7.1 Precautions for safe handling

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| Safe handling | <p>The greatest potential for injury caused by molten materials occurs during purging of machinery (moulders, extruders etc.)</p> <p>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.</p> <p>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.</p> <p>Avoid process temperatures above decomposition temperatures. Overheating may occur at excessively high cylinder heats, overworking of the melt by wrong screw configuration, or by long dwell time in the machine. Under such conditions, thermal emissions and heat-degradation products might, without proper ventilation, reach hazardous concentrations in the converting area. Hot purgings should be collected only as thin flat strands to allow for rapid cooling. Hot purgings should be cooled by quenching in water in a well-ventilated area.</p> <p>Avoid all personal contact, including inhalation.</p> <p>Wear protective clothing when risk of exposure occurs.</p> <p>Use in a well-ventilated area.</p> <p>Prevent concentration in hollows and sumps.</p> <p>DO NOT enter confined spaces until atmosphere has been checked.</p> <p>DO NOT allow material to contact humans, exposed food or food utensils.</p> <p>Avoid contact with incompatible materials.</p> <p>When handling, DO NOT eat, drink or smoke.</p> <p>Keep containers securely sealed when not in use.</p> <p>Avoid physical damage to containers.</p> |
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| | <p>Always wash hands with soap and water after handling.</p> <p>Work clothes should be laundered separately. Launder contaminated clothing before re-use.</p> <p>Use good occupational work practice.</p> <p>Observe manufacturer's storage and handling recommendations contained within this SDS.</p> <p>Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.</p> <p>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)</p> <p>Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame.</p> <p>Establish good housekeeping practices.</p> <p>Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds.</p> <p>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. According to NFPA Standard 654, dust layers 1/32 in.(0.8 mm) thick can be sufficient to warrant immediate cleaning of the area.</p> <p>Do not use air hoses for cleaning.</p> <p>Minimise dry sweeping to avoid generation of dust clouds. Vacuum dust-accumulating surfaces and remove to a chemical disposal area. Vacuums with explosion-proof motors should be used.</p> <p>Control sources of static electricity. Dusts or their packages may accumulate static charges, and static discharge can be a source of ignition.</p> <p>Solids handling systems must be designed in accordance with applicable standards (e.g. NFPA including 654 and 77) and other national guidance.</p> <p>Do not empty directly into flammable solvents or in the presence of flammable vapors.</p> <p>The operator, the packaging container and all equipment must be grounded with electrical bonding and grounding systems. Plastic bags and plastics cannot be grounded, and antistatic bags do not completely protect against development of static charges.</p> <p>Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.</p> <p>Do NOT cut, drill, grind or weld such containers.</p> <p>In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.</p> |
| Other information | <p>Store in original containers.</p> <p>Keep containers securely sealed.</p> <p>Store in a cool, dry area protected from environmental extremes.</p> <p>Store away from incompatible materials and foodstuff containers.</p> |





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| | <p>Protect containers against physical damage and check regularly for leaks.</p> <p>Observe manufacturer's storage and handling recommendations contained within this SDS.</p> <p>For major quantities:</p> <p>Consider storage in banded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams}.</p> <p>Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.</p> |
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7.2 Conditions for safe storage, including any incompatibilities

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|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Suitable container | <p>Multi-ply paper bag with sealed plastic liner or heavy gauge plastic bag.</p> <p>NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse. Check that all containers are clearly labelled and free from leaks. Packing as recommended by manufacturer.</p> |
| Storage incompatibility | <p>Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.</p> <p>Avoid reaction with oxidising agents</p> |

7.3 Specific end use(s)

Not Available

SECTION 8 Exposure controls / personal protection

8.1 Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|---------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------|---------|---------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust | styrene/butadiene/acrylonitrile copolymer | Particles not otherwise regulated | 8 mg/m3 | Not Available | Not Available | (Name (a - refers to dust with free SiO2 less than 10 %, free of asbestos and toxic substances, and no occupational exposure limit has been established.) |





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| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|--------------------------------------------------------------------------|---------------|---------------|----------|-----------|---------------|-----------|
| China Occupational Exposure Limits for Hazardous Agents in the Workplace | acrylonitrile | Acrylonitrile | 1 mg/m3 | 2 mg/m3 | Not Available | Skin, G2B |
| China Occupational Exposure Limits for Hazardous Agents in the Workplace | styrene | Styrene | 50 mg/m3 | 100 mg/m3 | Not Available | Skin, G2B |

Emergency Limits

| Ingredient | TEEL-1 | TEEL-2 | TEEL-3 |
|---------------|---------------|---------------|---------------|
| acrylonitrile | 0.15 ppm | Not Available | Not Available |
| styrene | Not Available | Not Available | Not Available |

| Ingredient | Original IDLH | Revised IDLH |
|---------------------------------------------|---------------|---------------|
| styrene/ butadiene/ acrylonitrile copolymer | Not Available | Not Available |
| acrylonitrile | 85 ppm | 60 ppm |
| butadiene | Not Available | Not Available |
| styrene | 700 ppm | Not Available |

8.2 Exposure controls

| | |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appropriate engineering controls | <p>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.</p> |
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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 usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. 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.

| Type of Contaminant: | Air Speed: |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| solvent, vapours, degreasing etc., evaporating from tank (in still air). | 0.25-0.5 m/s (50-100 f/min.) |
| aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5-1 m/s (100-200 f/min.) |
| 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 |



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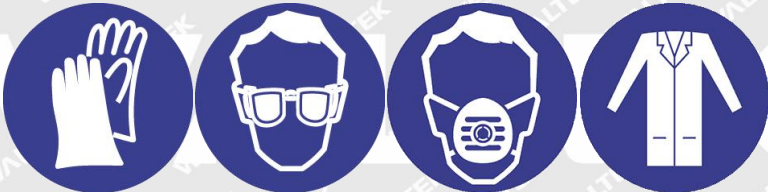
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| | <p>2: Contaminants of low toxicity or of nuisance value only.</p> | <p>2: Contaminants of high toxicity</p> |
| | <p>3: Intermittent, low production.</p> | <p>3: High production, heavy use</p> |
| | <p>4: Large hood or large air mass in motion</p> | <p>4: Small hood-local control only</p> |
| <p>Personal protection</p> |  | |
| <p>Eye and face protection</p> | <p>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 59], [AS/NZS 1336 or national equivalent]</p> | |
| <p>Skin protection</p> | <p>See Hand protection below</p> | |
| <p>Hands/feet protection</p> | <p>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.</p> | |





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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 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.

Personal hygiene is a key element of effective hand care. 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.

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 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.

As defined in ASTM F-739-96 in any application, gloves are rated as:

- Excellent when breakthrough time > 480 min
- Good when breakthrough time > 20 min
- Fair when breakthrough time < 20 min
- Poor when glove material degrades

For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.

Glove thickness may also vary depending on the glove manufacturer, the glove type and the





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| | <p>glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.</p> <p>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:</p> <p>Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.</p> <p>Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential</p> <p>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.</p> <p>When handling hot materials wear heat resistant, elbow length gloves.</p> <p>Rubber gloves are not recommended when handling hot objects, materials</p> <p>Protective gloves eg. Leather gloves or gloves with Leather facing</p> <p>Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <p>polychloroprene. nitrile rubber. butyl rubber. fluorocaoutchouc. polyvinyl chloride.</p> <p>Gloves should be examined for wear and/ or degradation constantly.</p> |
| Body protection | See Other protection below |
| Other protection | <p>When handling hot or molten liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.</p> <p>Usually handled as molten liquid which requires worker thermal protection and increases hazard of vapour exposure.</p> <p>CAUTION: Vapours may be irritating.</p> <p>Overalls. P.V.C apron. Barrier cream. Skin cleansing cream. Eye wash unit.</p> |

Respiratory protection

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

| | | | | | |
|----------|---------|------------|----------------------|----------------------|------------------------|
| Required | Minimum | Protection | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|----------|---------|------------|----------------------|----------------------|------------------------|



*



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| | | | |
|----------------|--------------------|------------|-----------------|
| Factor | | | |
| up to 10 x ES | AX P1 Air-line* | - - | AX PAPR-P1 - |
| up to 50 x ES | Air-line** | AX P2 | AX PAPR-P2 |
| up to 100 x ES | - | AX P3 | - |
| | | Air-line* | - |
| 100+ x ES | - | Air-line** | AX 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 degC)

Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.

The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).

Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.

Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.

Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)

Use approved positive flow mask if significant quantities of dust becomes airborne.

Try to avoid creating dust conditions.

For molten materials:

SECTION 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

| | |
|--------------------|-------------|
| Color | Black |
| Form | Strip solid |
| Odour | Odorless |
| Melting Range (°C) | No data |





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| | |
|----------------------------------------|---------|
| Boiling Range (°C) | No data |
| Flash Point (°C) | No data |
| Decomposition Temp (°C) | No data |
| Autoignition Temp (°C) | No data |
| Upper Explosive Limit (%) | No data |
| Lower Explosive Limit (%) | No data |
| Volatile Component (%vol) | No data |
| Molecular Weight | No data |
| Viscosity | No data |
| Solubility in water (g/L) | No data |
| pH (1% solution) | No data |
| pH (as supplied) | No data |
| Vapour Pressure (kPa) | No data |
| Specific Gravity (water=1) | No data |
| Relative Vapour Density (air=1) | No data |
| Evaporation Rate | No data |

9.2 Other information

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 |





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SECTION 11 Toxicological information

11.1 Information on toxicological affects

| | |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acute Toxicity | |
| LD/LC50 values relevant for classification | No data. |
| Primary irritant effect | |
| On the skin | No data. |
| On the eyes | No data. |
| Inhaled | No data. |
| Sensitization | No known sensitizing effects. |
| More information on toxicity | According to the calculation method of the general EU classification guidelines for preparations (printed in the latest edition), there are no classification restrictions for this product. There are no obvious acute toxicity data to confirm the literature search. |

11.2 Information on other hazards

No data.

SECTION 12 Ecological information

12.1 Toxicity

| | | | | | |
|------------------------------------------------------|---------------|--------------------|-------------------------------|---------------|---------------|
| styrene/ butadiene/ acrylonitrile copolymer | Endpoint | Test Duration (hr) | Species | Value | Source |
| | Not Available | Not Available | Not Available | Not Available | Not Available |
| acrylonitrile | Endpoint | Test Duration (hr) | Species | Value | Source |
| | EC50 | 72h | Algae or other aquatic plants | 1.63mg/l | 2 |
| | NOEC(ECx) | 360h | Fish | 0.15mg/l | 2 |
| | EC50 | 48h | Crustacea | 2.5mg/l | 2 |
| | LC50 | 96h | Fish | 3mg/l | 1 |
| butadiene | Endpoint | Test Duration (hr) | Species | Value | Source |
| | Not Available | Not Available | Not Available | Not Available | Not Available |
| styrene | Endpoint | Test Duration (hr) | Species | Value | Source |
| | | | | | |



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| | | | | | |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------------------|------------|---|
| | EC50 | 72h | Algae or other aquatic plants | 1.4mg/l | 1 |
| | EC50 | 48h | Crustacea | 4.7mg/l | 1 |
| | NOEC(ECx) | 96h | Algae or other aquatic plants | 0.063mg /l | 1 |
| | LC50 | 96h | Fish | 4.02mg/l | 2 |
| | EC50 | 96h | Algae or other aquatic plants | 0.72mg/l | 1 |
| Legend: | Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - 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 | | | | |

12.2 Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|---------------|-----------------------------|-----------------------------|
| acrylonitrile | LOW (Half-life = 46 days) | LOW (Half-life = 7.88 days) |
| styrene | HIGH (Half-life = 210 days) | LOW (Half-life = 0.3 days) |

12.3 Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---------------|-----------------|
| acrylonitrile | LOW (BCF = 48) |
| styrene | LOW (BCF = 77) |

12.4 Mobility in soil

| Ingredient | Mobility |
|---------------|-------------------|
| acrylonitrile | LOW (KOC = 8.3) |
| styrene | LOW (KOC = 517.8) |

12.5 Results of PBT and vPvB assessment

No Data.

12.6 Endocrine disrupting properties

No Data.

12.7 Other adverse effects

No Data.





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SECTION 13 Disposal considerations

13.1 Waste treatment methods

| | |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Waste chemicals:</p> | <p>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.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <p>Reduction Reuse Recycling Disposal (if all else fails)</p> <p>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. In most instances the supplier of the material should be consulted.</p> <p>DO NOT allow wash water from cleaning or process equipment to enter drains.</p> <p>It may be necessary to collect all wash water for treatment before disposal.</p> <p>In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.</p> <p>Where in doubt contact the responsible authority.</p> |
| <p>Contaminated packing materials:</p> | <p>Refer to section above</p> |
| <p>Precautions for Transport:</p> | <p>Refer to section above</p> |

SECTION 14 Transport information

14.1 UN number or ID number

Not Applicable

14.2 UN proper shipping name

Not Applicable

14.3 Transport hazard class(es)





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Not Applicable

14.4 Packing group

Not Applicable

14.5 Environmental hazards

Not Applicable

14.6 Special precautions for user

Not Applicable

14.7 Maritime transport in bulk according to IMO instruments

Not Applicable

SECTION 15: Regulatory information

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

The product should follow the relevant regulations of EU Directive/Hazardous substances regulations.

15.2 Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

The SDS 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.

According to regulations, the product is likely to be classified as article and is out of scope of a SDS as set out in regulation. This report is for reference only.

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