

Effective Date : June 2017

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I. Identification

SUPPLIER:

Norski Holdings Ltd
10 Northpoint Street, Plimmerton 5024, New Zealand
Tel: (04) 233 6184

PRODUCT NAME: RP50/51 – Resorcinol Glue Hardener

RECOMMENDED USE: Powder hardener used with resorcinol formaldehyde or phenol resorcinol

II. Hazard Classification

NEW ZEALAND: Classified as hazardous according to criteria in the Hazardous Substances (Minimum Degrees of Hazard) Regulations 2001.

HSNO CLASSIFICATIONS:

Category 4 – Acute Toxicity (Oral)
Category 1A – Carcinogen
Category 4 – Chronic Aquatic Hazard
Category 2 – Flammable Solid
Category 1A – Germ Cell Mutagen
Category 1 – Organ Damage Single Exposure
Category 1 – Respiratory Sensitizer
Category 1 – Serious Eye Damage
Category 2 - Skin corrosion/Irritation
Category 1 – Skin Sensitizer

HAZARD STATEMENT CODES:

4.1.1B – Flammable solid
6.1D – Harmful if swallowed
6.3A – Causes skin irritation
6.5A – May cause allergic or asthmatic symptoms or breathing difficulties if inhaled
6.5B – May cause allergic skin reaction
6.6A – May cause genetic defects
6.7A – May cause CANCER
6.9A – Causes damage to organs by skin contact
8.3A – Causes serious eye damage
9.1D – Slightly harmful in the aquatic environment or are otherwise designed for biocidal action
9.2D – Slightly harmful in the soil environment
9.3C – Harmful to terrestrial vertebrates

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MATERIAL SAFETY DATA SHEET
RESORCINOL GLUE HARDENER

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PRECAUTIONARY STATEMENT(S):

Prevention

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat/sparks/open flames/hot surfaces – no smoking.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Do not breathe dust/fume/gas/mist/vapours/spray.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Wash thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Contaminated work clothing should not be allowed out of the workplace.
- Avoid release to the environment.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.
- In case of inadequate ventilation, wear respiratory protection.

Response

- If swallowed, call a Poison Centre or doctor/physician if you feel unwell. If on skin, wash with plenty of soap and water.
- If inhaled, if breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing.
- If in eyes, rinse cautiously with water for several minutes, remove contact lenses if present and easy to do. Continue rinsing. If exposed, call a Poison Centre or doctor/physician.
- If exposed or concerned, get medical advice/attention. Rinse mouth.
- If eye irritation persists, get medical advice/attention.
- If experiencing respiratory symptoms, call a Poison Centre or doctor/physician. Wash contaminated clothing before reuse.

Storage

- Store locked up.
- Powdered Phenolic resin is a combustible dust and this means that it is capable of forming flammable and explosive dust clouds in air. Such dust clouds can be sensitive to low energy ignition.
- Combustion can also propagate along a powder trail of settled dust, or result in repeated explosions as more dust is disturbed and rises into the air.
- The presence of dust external to plant items creates a potential hazard in that a secondary explosion could occur in the event of a flame or burning material being ejected due to a primary explosion within plant equipment.
- The severity of explosions by ignition of dust clouds is often much greater than that of vapour or gas mixtures and in industrial situations the potential exists for substantial damage to structures and harm to personnel.
- For Phenol Formaldehyde* powders, the explosion severity is 3.9 based upon an explosion severity rating. Similarly, flammability rating for Phenol Formaldehyde* powders (relative sensitivity of dusts to ignition) is 9.3 based upon a severity rating. *[Empirical scale based upon standard Pittsburgh coal dust being 1.0].
- Guidance as how to safely handle combustible dust can be obtained from including but not limited to AS/NZ standard 4745:2004 (Code of Practice for handling Combustible Dusts) and US National Fire Protection Association Standard 654. It is highly recommended that these standards be consulted prior to assessing and addressing the risks that can be encountered, other reference standards are (including but not limited to):
 - AS/NZ 30000: 2000 Electrical installations
 - AS/NZS 2381.1: 1999 Electrical equipment for explosive atmospheres

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III. Composition/Information on Ingredients

Name	CAS	%
Paraformaldehyde	30525-89-4	30-60

Other ingredients determined not to be hazardous or not contributing to the final classification.
Manufacturer has supplied full ingredient information for CHEMWATCH assessment.

IV. First Aid Measures

SWALLOWED:

- If swallowed, refer for medical attention where possible without delay. For advice contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings, send the patient to a hospital together with a copy of the MSDS.
- Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
 - Induce vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE : Wear a protective glove when inducing vomiting by mechanical means.

EYE:

If this product comes in contact with the eyes:

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

SKIN:

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.

INHALED:

If fumes or combustion products are inhaled, remove from the contaminated area:

- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

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- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN:

(for poisons (where specific treatment regime is absent)

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary. Administer oxygen by non-rebreather mask at 10 – 15 L/min.
- Monitor and treat, where necessary, for pulmonary oedema. Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- DO NOT use emetics. Where ingestion is suspected, rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive pressure ventilation using a bag valve mask might be of use. Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE, 2nd Ed. 1994

- Treat symptomatically.
- For acute or short-term repeated exposures to formaldehyde:

INGESTION

- Patients present early with severe corrosion of the gastro-intestinal tract and systemic effects. Inflammation and ulceration may progress to strictures.
- Severe acidosis results from rapid conversion of formaldehyde to formic acid. Coma, hypotension, renal failure and apnoea complicate ingestion.
- Decontaminate by dilution with milk or water containing ammonium acetate; vomiting should be induced.
- Follow with gastric lavage using a weak ammonia solution (converts formaldehyde to relatively inert pentamethylenetetramine). Gastric lavage is warranted only in first 15 minutes following ingestion.

SKIN

- Formaldehyde can combine with epidermal protein to produce a hapten-protein couple capable of sensitising T-lymphocytes. Subsequent exposures cause a type IV hypersensitivity reaction (ie allergic contact dermatitis). [Ellenhorn & Barcelous: Medical Toxicology].

EMERGENCY: 0800 POISON (764 766)

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V. Fire-fighting Measures

SUITABLE EXTINGUISHING MEDIA:

FOR SMALL FIRES

- Dry chemical, CO₂, water spray or foam

FOR LARGE FIRES

- Water spray, fog or foam.

FIRE FIGHTING:

- Alert the Fire Brigade and tell them location and nature of hazard.
 - Wear breathing apparatus plus protective gloves.
 - Prevent, by any means available, spillage from entering drains or water course.
 - Fight fire from a safe distance, with adequate cover.
 - If safe, switch off electrical equipment until vapour fire hazard removed.
 - Use water delivered as a fine spray to control fire and cool adjacent area.
 - Avoid spraying water onto liquid pools.
 - DO NOT approach containers suspected to be hot.
 - Cool fire exposed containers with water spray from a protected location.
 - If safe to do so, remove containers from path of fire.
 - When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

FIRE/EXPLOSION HAZARD:

- Flammable solid which burns and propagates flame easily, even when partly wetted with
- water. Any source of ignition, ie friction heat, sparks or flame, may cause fire or explosion.
- May burn fiercely.
- May form explosive mixtures with air.
- May REIGNITE after fire is extinguished.
- Containers may explode on heating.
- Solids may pollute waterways.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport, thereby providing a source of ignition.
- Decomposition products may be irritating, poisonous or corrosive.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), formaldehyde, other pyrolysis products typical of burning organic material.

FIRE INCOMPATIBILITY:

- Avoid contamination with oxidising agents ie nitrates, oxidising acids, chlorine bleaches, pool chlorine, etc as ignition may result.

PERSONAL PROTECTIVE EQUIPMENT:

- Gloves, boots (chemical
- resistant). Breathing apparatus.

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VI. Accidental Release Measures

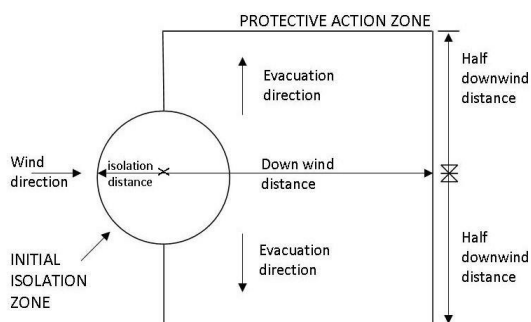
MINOR SPILLS:

- Remove all ignition sources.
 - DO NOT touch or walk through spilled material.
 - Clean up all spills immediately.
 - Avoid contact with skin and eyes.
 - Prevent dust cloud.
 - With clean shovel (preferably non-sparking), place material into clean, dry container and cover loosely.
 - Move containers from spill area.
 - Control personal contact by using protective equipment.

MAJOR SPILLS:

- Clear area of personnel and move upwind.
 - DO NOT touch or walk through the spill material.
 - Alert Fire Brigade and tell them location and nature of hazard.
 - Control personal contact by using protective equipment.
 - Prevent, by any means available, spillage from entering drains or water course.
 - No smoking, naked lights or ignition sources.
 - Increase ventilation.
 - Stop leak if safe to do so.
 - Contain or cover with sand, earth or vermiculite.
 - Use only spark-free shovels and explosion proof equipment.
 - Collect recoverable product into labelled containers for recycling.
 - Collect solid residues and seal in labelled drums for disposal.
 - Wash area with water and dike for later disposal and prevent runoff into drains.
 - After clean-up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
 - If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTIONS FOR SPILL:



From IERG (Canada/Australia)

Isolation Distance	25 metres
Downwind Protection Distance	250 metres
IERG Number	20

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FOOTNOTES

1. PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
2. PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
3. INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
4. SMALL SPILLS involve a leaking package of 200 litres or less, such as a drum (jerry can or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
5. Guide 131 is taken from the US DOT emergency response guide book.
6. IERG information is derived from CANUTEC – Transport Canada.
Personal Protective Equipment advice is contained in Section 8 of the MSDS.

VII. Handling and Storage

PROCEDURE FOR HANDLING:

- Avoid all personal contact including inhalation.
 - Wear protective clothing when risk of over-exposure occurs.
 - Use in a well-ventilated area.
 - Prevent concentration in hollows and sumps.
 - DO NOT enter confined spaces until atmosphere has been checked.
 - DO NOT allow material to contact humans, exposed food or food utensils.
 - Avoid smoking, naked lights, heat or ignition sources.
 - When handling, DO NOT eat, drink or smoke.
 - Avoid contact with incompatible materials.
 - Keep containers securely sealed when not in use.
 - Avoid physical damage to containers.
 - Always wash hands with soap and water after handling.
 - Work clothes should be laundered separately. Launder contaminated clothing before re-use.
 - Use good occupational work practice.
 - Observe manufacturer's storing and handling recommendations.
 - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
 - 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.
 - Do NOT cut, drill, grind, weld such containers.
 - In addition, ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

SUITABLE CONTAINER:

- For low viscosity materials and solids:
 - Drums and jerry cans must be of the non-removable head type.
 - Where a can is to be used as an inner package, the can must have a screwed enclosure.

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- For materials with a viscosity of at least 2680 cSt. (23 deg. C):
 - Removable head packaging and
 - Cans with friction closures may be used.
- Where combination packages are used, there must be sufficient inert absorbent to absorb completely any leakage that may occur, unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.
- All combination packages for Packing group I and II must contain cushioning material.

STORAGE INCOMPATIBILITY:

- Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS:

- Rotate all stock to prevent ageing. Use on FIFO (First In-First Out) basis.
- Store below 38 deg. C.

FOR MINOR QUANTITIES

- Store in an indoor fireproof cabinet or in a room of non-combustible construction.
- Provide adequate portable fire extinguishers in or near the storage area.

FOR PACKAGE STORAGE

- Store in original containers in approved flame-proof area. No smoking, naked lights, heat or ignition sources.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped. Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry, well-ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Protect containers from exposure to weather and from direct sunlight unless: (a) the packages are of metal or plastic construction; (b) the packages are securely closed are not opened for any purpose while in the area where they are stored, and (c) adequate precautions are taken to ensure that rain water, which might become contaminated by the dangerous goods, is collected and disposed of safely.
- Ensure proper stock-control measures are maintained to prevent prolonged storage of dangerous goods.
- Observe manufacturer's storing and handling recommendations.

VIII. Exposure Controls/Personal Protection

EXPOSURE CONTROLS

The following materials had no OELs on our records:

Paraformaldehyde CAS:30525-89-4

MATERIAL DATA

RP50/51 HARDENER – not available.

PARAFORMALDEHYDE


- Odour Threshold Value for formaldehyde: 0.98 ppm (recognition)

NOTE : Detector tubes for methanol, measuring in excess of 0.2 ppm, are commercially available. Formaldehyde vapour exposure:

Primary irritation is dependent on duration of exposure and individual susceptibility. The following are typical symptoms encountered at various exposure levels.

0.1 ppm – Lower level of mucous eye, nose and throat irritation
0.8 ppm – Typical threshold of perception

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- 1-2 ppm – Typical threshold of irritation
- 2-3 ppm – Irritation of eyes, nose and throat
- 4-5 ppm – Increased irritation, tearing, headache, pungent odour
- 10-20 ppm – Profuse tearing, severe burning, coughing
- 50 ppm – Serious bronchial and alveolar damage
- 100 ppm – Formaldehyde induced chemical pneumonia and death

Despite the intent of the TLV Ceiling recommendation, it is believed that 0.3 ppm will not protect that portion of the workforce (up to 20%) reported to be responsive to low ambient concentrations. Because of the dose-related carcinogenic activity for rat and mouse inhalation of formaldehyde, the report of macromolecular adducts in the upper and lower respiratory tracts of non-human primates following inhalation of formaldehyde, the human case reports of upper respiratory tract malignant melanoma associated with formaldehyde inhalation and the suggestive epidemiologic data on human cancer risk, the TLV Committee recommends that workplace formaldehyde air concentrations be reduced to the lowest possible levels that can be achieved using engineering controls. Odour Safety Factor (OSF).
OSF = 0.36 (FORMALDEHYDE).
No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION

- **Eye** – 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 lens 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)
- **Hands/Feet**
 - Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
 - Frequency and duration of contact
 - Chemical resistance of glove material
 - Glove thickness and
 - Dexterity
 - Select gloves tested to a relevant standard (eg Europe EN 374, US F739)
 - 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) 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) is recommended.
 - 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.
 - Wear physical protective gloves eg leather.
 - Wear safety footwear.
- **Other**
 - Overalls
 - Eyewash unit
 - Barrier cream
 - Skin cleansing cream
 - Some plastic personal protective equipment (PPE) (eg gloves, aprons, overshoes) are not recommended as they may

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product static electricity

- For large scale or continuous use, wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

● **Respirator**

- 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. 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.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

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

* - Negative pressure demand ** - Continuous flow

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

● **Engineering Controls**

For large-scale or continuous use:

- Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems
- Provide dust collectors with explosion vents
- 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.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
- 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:
 - Particle dust respirators, if necessary, combined with an absorption cartridge;
 - Filter respirators with absorption cartridge or canister of the right type;
 - Fresh-air hoods or masks;
- Build-up of electrostatic charge on the dust particle, 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.

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MATERIAL SAFETY DATA SHEET
RESORCINOL GLUE HARDENER

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IX. Physical and Chemical Properties

APPEARANCE: Light brown powder with formaldehyde odour, partly soluble in water.

PHYSICAL:

State	Divided Solid	Molecular Weight	Not Applicable
Melting Range (°C)	Not applicable	Viscosity	350-1000 cSt@25°C
Boiling Range (°C)	120-170 (paraformaldehyde)	Solubility in water (g/L)	Partly miscible
Flash Point (°C)	70 (paraformaldehyde)	pH (1% solution)	Not available
Decomposition Temp (°C)	Not available	pH (as supplied)	6.0 – 8.0
Autoignition Temp (°C)	300 (paraformaldehyde)	Vapour Pressure (kPa)	Not applicable
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.4
Lower Explosive Limit (%)	Not available	Relative Vapour Density (air=1)	1.03 (paraformaldehyde)
Volatile Component (%vol)	Not available	Evaporation Rate	Not applicable

X. Chemical Stability and Reactivity Information

CONDITIONS CONTRIBUTING TO STABILITY:

- Presence of heat source and ignition source.
 - Presence of incompatible materials
 - Product is considered stable
 - Hazardous polymerisation will not occur

For incompatible materials – refer to Section 7 – Handling and Storage

XI. Toxicological Information

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED: Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may product serious damage to the health of the individual. Not normally a hazard due to the physical form of product. The material is a physical irritant to the gastro-intestinal tract.

EYE: If applied to the eyes, this material causes severe eye damage. There is evidence that material may product eye irritation in some persons and produce eye damage 24 hours or more after instillation. Severe inflammation may be expected with pain. There may be damage to the cornea. Unless treatment is prompt and adequate, there may be permanent loss of vision. Conjunctivitis can occur following repeated exposure.

SKIN: The material may cause severe inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. **INHALED:** The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur

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further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

CHRONIC HEALTH EFFECTS: Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related system problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. Long-term exposure to high dust concentrations may cause changes in lung function ie pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Primate symptom is breathlessness; lung shadows show on X-ray.

TOXICITY AND IRRITATION:

RP50/51 HARDENER: Not available. Refer to individual constituents.

PARAFORMALDEHYDE: Unless otherwise specified data extracted from RTECS – Register of Toxic Effects of Chemical Substances.

Oral (rat) LD50: 800 mg/kg

Skin (rabbit): 500 mg/24h SEVERE

Oral (rat) LD50: 592 mg/kg*

Eye (rabbit): 100 mg SEVERE

Inhalation (rat) LC50: 1070 mg/m³/4h *[Orica]

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 eg 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. Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. The material may cause severe skin irritation after prolonged or repeated exposure and may product on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may product severe ulceration.

XII. Ecological Information

Paraformaldehyde 96 hr LC50 (60) mg/L. Rainbow trout, Donaldson trout Fish Source: Calculated.

Paraformaldehyde

For Paraformaldehyde:

Environmental fate:

Formaldehyde is ubiquitous in the environment as a contaminant of smoke and as photochemical smog. In the atmosphere, formaldehyde both photolyses and reacts with reactive free radicals (primarily hydroxyl radicals); half-lives in the sunlit tropospheres are 1.25 to 6 hours for photolysis, and 7.13-71.3 hours for reaction with hydroxyl radicals.

Reaction with nitrate radicals, insignificant during the day, may be an important removal process at night. Due to its solubility, formaldehyde will efficiently transfer to rain and surface water; one model predicts dry deposition and wet removal half-lives of 19 and 50 hours, respectively.

In water, formaldehyde will biodegrade to low concentrations within days; adsorption to sediment and volatilisation are not expected to be

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significant routes.

In soil, aqueous solutions of formaldehyde leach through the soil' at high concentrations adsorption to clay minerals may occur. Although biodegradable under both aerobic and anaerobic conditions the fate of formaldehyde in soil is unclear. It does not bioconcentrate in the food chain.

Concentrated solutions containing formaldehyde are unstable, both oxidising slowly to form formic acid and polymerising. In the presence of air and moisture, polymerisation takes place readily in concentrated solutions at room temperature to form paraformaldehyde, a solid mixture of linear polyoxymethylene glycols containing 90-99% formaldehyde.

Drinking Water Standards:

Hydrocarbon total: 10 ug/l (UK max).

Pesticide: 0.1 ug/l (UK max).

Formaldehyde: 900 ug/l (WHO guideline).

Air Quality Standards:

<0.1 mg/m³ as a 30 min average, indoor air, non-industrial buildings (WHO guideline). DO NOT discharge into sewer or waterways.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
Formaldehyde	LOW		LOW	HIGH

XIII. Disposal Considerations

Containers may still present a chemical hazard/danger when empty. Return to supplier for reuse/recycling if possible.

Otherwise:

If container cannot 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.

Legalisation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common – the user should

- investigate: Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning or process equipment to enter drains. It may be necessary to collect all wash water for treatment before disposal.

In all cases, disposal to sewer may be subject to local laws and regulations and these should be considered first. Where in doubt contact the responsible authority.

Cover residues with sodium metabisulfite.

Mix in a small amount of water.

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Scoop up and wash to sewer with a large amount of water. Recycle wherever possible.

Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.

Dispose of by: burial in a landfill specifically licenced to accept chemical and/or pharmaceutical wastes or incineration in a licenced apparatus (after admixture with suitable combustible material).

Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

XIV. Transport Information

Labels Required: FLAMMABLE SOLID

HAZCHEM: 1Z

Land Transport UNDG:

Class or division:	4.1	Subsidiary risk:	None
UN No:	2213	UN packing group:	III
Shipping Name:	PARAFORMALDEHYDE		

Air Transport IATA:

ICAO/IATA Class:	4.1	ICAO/IATA Subrisk:	None
UN/ID Number:	2213	Packing Group:	III
Special provisions:	None		

Shipping Name: PARAFORMALDEHYDE

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: IMDG

XV. Regulatory Information

REGULATIONS FOR INGREDIENTS

Paraformaldehyde (CAS: 30525-89-4) is found on the following regulatory lists:

“New Zealand Hazardous Substances and New Organisms (HSNO) Act – Classification of Chemicals”, “New Zealand Hazardous Substances and New Organisms (HSNO) Act – Classification of Chemicals – Classification Data”, “New Zealand Hazardous Substances and New Organisms (HSNO) Act – Dangerous Goods”, “New Zealand Inventory of Chemicals (NZIoC)”, “OECD Representative List of High Production Volume (HPV) Chemicals”.

No data for RP50/51 HARDENER (CW: 6605-92)

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XVI. Other Information

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

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