

## NIOSH EMERGENCY RESPONSE CARD

## BIOTOXIN

**RICIN**

UN #: 3172 GUIDE 153  
 CAS #: 9009-86-3  
 Alternate CAS #: 9067-26-9  
 RTECS #: VJ2625000

Ricine  
 Ricinus lectin  
 Ricinus agglutinin  
 Ricinus toxin  
 Lectin isolated from seeds of the castor bean  
 (*Ricinus communis*) protein/polypeptide

Chemical Formula: N/A

Molecular mass: N/A

TYPES OF HAZARD/ HAZARD/ EXPOSURE	ACUTE HAZARDS/ CLINICAL SIGNS/ SYMPTOMS	PREVENTION/ PERSONAL PROTECTIVE EQUIPMENT	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	N/A	Avoid generating dust.	Foam, dry chemical powder, BCF (where regulations permit), carbon dioxide, water spray or fog - large fires only.
<b>EXPLOSION</b>	N/A	N/A	N/A
<b>ROUTE OF EXPOSURE</b>			
<b>Synopsis:</b>	<b>Extremely Toxic. May be Fatal.</b> <b>Ricin (and Abrin) cause toxicity by inhibition of protein synthesis.</b> <b>May cause severe allergic reactions.</b>	<b>AVOID ALL CONTACT.</b> <b>STRICT HYGIENE!</b> <b>May adhere to skin or clothing.</b>	<b>Seek medical attention immediately.</b>
<b>Inhalation:</b>	May cause severe lung damage and death in humans (based on reports of exposure in animals). Symptoms may include fever, cough, and pulmonary edema within 18-24 hours and respiratory distress and death within 36-72 hours. Repeated exposure in humans might lead to allergic/asthma-like symptoms including congestion of the nose and throat, itchiness of the eyes, hives, tightness of the chest, and in severe cases, wheezing.	Pressure demand, self-contained breathing apparatus (SCBA) (SCBA CBRN, if available) is recommended in response to non-routine emergency situations.  In other situations, two types of full facepiece, tight-fitting masks may be used: 1) Powered Air Purifying respirator (PAPR) with HEPA filters; or 2) Air Purifying respirator (APR) with P100 filters.  See <a href="#">CDC/NIOSH Interim Recommendations</a> for guidance on selection criteria.	Fresh air, rest. Half-upright position. If breathing is difficult, administer oxygen. Perform CPR if necessary.  Seek medical attention immediately.
<b>Skin:</b>	Risk of dermal toxicity is low. May be absorbed through irritated, damaged, or injured skin or through normal skin if aided by solvent carrier. Potential for allergic skin reaction; redness, blisters, pain.	Tychem® BR or Responder® CSM protective clothing. Eyes should be protected when possible.	Remove contaminated clothes. Rinse skin with plenty of water or shower (and soap if available).  Seek medical attention immediately.
<b>Eyes:</b>	Tearing, swelling of the eye-lids, pain, redness, corneal injury. Systemic toxicity and lethality reported in animals with	Full face-piece respirator provides eye protection.	Immediately flush with large amounts of tepid water for at least 15 minutes.

	isolated ocular exposures.		Seek medical attention immediately.
<b>Ingestion:</b>	<p>Symptoms are rapid in onset (generally less than a few hours) following ingestion.</p> <ul style="list-style-type: none"> <li>● Nausea, vomiting, abdominal pain and cramping.</li> <li>● Diarrhea</li> <li>● Gastrointestinal Bleeding</li> <li>● Low or no urinary output</li> <li>● Fever</li> <li>● Thirst</li> <li>● Sore Throat</li> <li>● Headache</li> <li>● Vascular collapse and shock</li> </ul>	Do not eat, drink, or smoke during work. Wash hands before eating.	May be fatal. However, the death rate even among symptomatic patients is generally low. Do not induce vomiting. Rinse mouth. Use slurry of activated charcoal. If individual is drowsy or unconscious, do not give anything by mouth. In the event of vomiting, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Early and aggressive IV fluid and electrolyte replacement. Seek medical attention immediately.

<b>OCCUPATIONAL EXPOSURE LIMITS (OELs)</b>	<p>OSHA PEL: N/A          NIOSH REL: N/A          ACGIH TLV: N/A          ChemWatch: Ceiling: 0.00006 (sensitizer) mg/m<sup>3</sup>          NIOSH IDLH: N/A</p>
<b>SAMPLING AND ANALYTICAL METHODS</b>	<p>NIOSH: N/A          OSHA: N/A          Contact Laboratory Response Network Lab for sampling information (see <a href="http://emergency.cdc.gov/agent/ricin/labtesting.asp">http://emergency.cdc.gov/agent/ricin/labtesting.asp</a>)</p>

<b>DECONTAMINATION</b>	<p>Limited data available regarding decontamination approaches.</p> <p><b>Patient/Victim:</b> Wash with soap and water. Work clothes should be laundered separately. Launder contaminated clothing before re-use. Do not take clothing home.</p> <p><b>Equipment:</b> If not disposable, personal protective equipment such as gloves, faceshields, and goggles should be decontaminated by thoroughly rinsing with soap and water, and then rinsing with water and allowing to air dry.</p> <p><b>Environment:</b> Check with EPA for any new cleanup developments. Surfaces can be cleaned with 0.1% or 0.5% solution of sodium hypochlorite (0.1% = 1 part household bleach to 49 parts of water; 0.5% = 1 part household bleach to 9 parts of water). No guidelines for contact time are available so post-cleaning surface sampling is recommended to check on effectiveness. Steam cleaning with a 0.1N solution of sodium hydroxide has been used for carpets. HEPA vacuums can be used as part of a clean up approach but other methods that can generate dust should be avoided.</p> <p><b>NOTE:</b> The use of proper personal protective equipment (PPE) is recommended for all workers exposed to dilute bleach and/or sodium hydroxide solutions used for decontamination. Cleanup workers are advised to wear respiratory protection (full-face respirator with combination acid gas/particulate filter for chlorine bleach, or particulate filter for sodium hydroxide) and gloves (butyl rubber, neoprene, nitrile, or polyethylene) as safeguards against chemical burns to the skin and airways.</p>
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<b>SPILLAGE DISPOSAL</b>	<p>Polyethylene or polypropylene container.</p> <p>Keep containers securely sealed when not in use.</p> <p>Store in a cool, dry, well-ventilated area and away from food stuff containers.</p>
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<b>PACKAGING &amp; LABELLING</b>	UN#: 3172 (GUIDE 153)
	Proper Shipping Name: N/A
	Hazard Class: 6.1(a)
	Packing Group: I
	<p>NFPA 704 Signal:</p> <p>Health - N/A          Flammability - N/A          Reactivity - N/A          Special - N/A</p>

<b>IMPORTANT DATA</b>	<p><b>PHYSICAL STATE; APPEARANCE:</b> White powder. NOTE that powder may be put into solution.</p> <p><b>PHYSICAL DANGERS:</b> Product is considered stable. Avoid contact with oxidizing agents.</p> <p><b>CHEMICAL DANGERS:</b> Hazardous polymerization will not occur.</p> <p><b>ROUTES OF EXPOSURE:</b> Can be absorbed by all routes of exposure.</p> <p><b>INHALATION RISK:</b> Pulmonary edema and potential death, irritation, and sensitization.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> Severe vomiting and diarrhea may result in severe dehydration (hypovolemic-shock) and multisystem organ failure: effects on GI tract, kidney, liver, and pancreas. Potentially fatal due to severe allergic reaction.</p> <p><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> Repeated inhalation exposures to sub-lethal levels may result in an allergic syndrome with congestion of nose and throat; itchy, watery eyes; hives; tightness of the chest; and in severe cases - wheezing.</p>					
<b>PHYSICAL PROPERTIES</b>	<p>Melting Point: N/A</p> <p>Boiling Point: decomposes (<i>See Additional Information.</i>)</p> <p>Vapor Pressure (20 °C): Negligible</p> <p>Density (20 °C): N/A</p> <p>Volatility: Negligible</p> <p>Specific gravity: N/A</p> <p>Aqueous solubility(20 °C): soluble</p> <p>Soluble: 10% NaCl solution estimated log <math>K_{ow}</math>: N/A</p> <p>Flashpoint: N/A</p> <p>Flammability: N/A</p>					
<b>ENVIRONMENTAL DATA</b>						
<b>ACUTE EXPOSURE GUIDELINES (AEGLS)</b>		10 min	30 min	1hr	4 hr	8 hr
	AEGL 1 (discomfort, non-disabling)	N/A	N/A	N/A	N/A	N/A
	AEGL 2 (irreversible or other serious, long-lasting effects or impaired ability to escape)	N/A	N/A	N/A	N/A	N/A
	AEGL 3 (life-threatening effects or death)	N/A	N/A	N/A	N/A	N/A
<b>NOTES</b>						
<p>Reported lethal dose estimates are based on animal experiments and vary depending on the route of exposure. Inhaled doses of 3 - 5 mcg/kg are lethal in mice; 20 - 40 mcg/kg have been shown to be lethal in nonhuman primates. Depending on species, oral exposures to ricin appear to be less toxic than are other routes of exposure and a toxic exposure in humans may involve mg/kg concentrations.</p>						
<b>ADDITIONAL INFORMATION</b>	<p>Ricin is detoxified in 10 mins at 176 °F (80 °C) and in 1 hr at 122 °F (50 °C); it is stable under ambient conditions.</p>					
<b>GLOSSARY OF ACRONYMS</b>	<p><b>APR</b> - Air-purifying Respirator  <b>CBRN</b> - Chemical, Biological, Radiological, Nuclear  <b>IDLH</b> - Immediately Dangerous to Life and Health  <b>REL</b> - Recommended Exposure Limit  <b>PEL</b> - Permissible Exposure Limit  <b>SCBA</b> - Self-Contained Breathing Apparatus</p>					
<b>IMPORTANT NOTICE:</b>	<p><b>RICIN (ERC9009-86-3)</b> The user should verify compliance of the cards with the relevant STATE or TERRITORY legislation before use. NIOSH, CDC 2003.</p>					

