PRODUCT NAME(S): Battle Jacket® CCU 90-120 Federal Green Resin

SECTION 1 – IDENTIFICATION

Manufacturer's Info:
Rhino Linings Corporation
9747 Businesspark Avenue
San Diego, CA 92131

Information phone: (858) 450 0441
Emergency contact: CHEMTREC (800) 424 9300

Product name: **Battle Jacket® CCU 90-120 Federal Green Resin**

SECTION 2 – HAZARD(S) IDENTIFICATION

OSHA Hazard Communication Standard:
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

GHS-Label Elements: **Signal Word:** DANGER

Pictogram(s):

GHS 05 GHS 08 GHS 07

Classification of the substance or mixture:

Hazard Class	Category	Hazard Statement Codes	Hazard Statements
Acute Toxicity, Oral	5	H303	May be harmful if swallowed
Acute Toxicity, Dermal	5	H313	May be harmful in contact with skin
Skin corrosion / irritation	1B	H314	Causes severe skin burns and eye damage
Serious eye damage / Eye irritation	1	H318	Causes serious eye damage.
Skin Sensitization	1B	H317	May cause an allergic skin reaction
Carcinogenicity	2	H351	Suspected of causing cancer by inhalation
Specific target organ toxicity, repeated exposure	2	H373	May cause damage to kidney and liver through prolonged or repeated exposure May cause damage to lungs/respiratory system through prolonged or repeated exposure by inhalation

Precautionary Statements:

Prevention:	P201	Obtain special instruction before use.
	P202	Do not handle until all safety precautions have been read and understood.
	P281	Use personal protective equipment as required.
	P260	Do not breathe mist, vapors, spray.
	P264	Wash exposed area with plenty of water and soap thoroughly after handling.
	P272	Contaminated work clothing should not be allowed out of the workplace.
Response:	P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P310	Immediately call a POISON CENTER or doctor/physician.
	P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
	P308 + P313	IF exposed or concerned: Get medical advice/attention.
	P314	Get medical advice/attention if you feel unwell.
	P363	Wash contaminated clothing before reuse.
Storage:	P405	Store locked up.
Disposal:	P501	Dispose of contents/container to hazardous or special waste collection point in accordance with local/regional/national/international regulations.

Hazards not otherwise classified: Not known.

Note: Negative effects of the components classified as possible carcinogen to humans are minimized since they are dispersed in a liquid as opposed to an inhalable fine powder form. However, precautions should be taken to avoid breathing mists created by heating, mixing or spraying and dust from cutting or grinding of cured product containing these components.

SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Components	CAS #	EC #	Concentration, %
Polyether Polyol	9082-00-2	618-655-1	60 – 90
Diethylene Glycol	111-46-6	203-872-2	5 – 10
Tris (2-chloro-1-methylethyl) phosphate	13674-84-5	237-158-7	5 – 10
Confidential Component 1	Trade Secret	Trade Secret	5 – 10
Confidential Component 2	Trade Secret	Trade Secret	0.5 – 5
Confidential Component 3	Trade Secret	Trade Secret	0.5 – 5
Zeolites	1318-02-1	930-915-9	0.5 – 5
Titanium Dioxide	13463-67-7	236-675-5	0.1 – 1
Carbon Black	1333-86-4	215-609-9	0.1 – 1

SECTION 4 – FIRST-AID MEASURES

Description of First Aid measures:

Inhalation: Remove exposed person to fresh air and keep at rest in a position comfortable for breathing.
If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Immediate medical attention required. Call a poison center or physician. In case of inhalation of decomposition products in a fire, symptoms may be delayed.

Skin: Wash material off of the skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes immediately and wash them before reuse. Immediate medical attention required. Call a poison center or physician.

Eye: Rinse cautiously with water for several minutes, especially under the eyelids. Remove contact lenses, if present and easy to do. Continue rinsing for at least 15 minutes. Do not rub eyes in order to prevent cornea injury. Immediate medical attention required. Call a poison center or physician.

Ingestion: Move to fresh air and keep at rest in a position comfortable for breathing. Remove dentures if any.
If the exposed person is conscious, rinse mouth with water and then give plenty of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Do not induce vomiting unless directed to do so by medical personnel.
If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required. Call a poison center or physician.

Most important symptoms/effects, acute and delayed: See Section 11 for more details.

General advice for First Aid responders: No action should be taken involving any personal risk or without suitable training. If potential for exposure exist refer to Section 8 for specific personal protective equipment. Show this SDS to physician.

Note to physician: Specific antidotes or neutralizers do not exist. Treatment should be supportive and based on the judgment of the physician in response to the reaction of the patient. Recommended medical monitoring for at least 24hours.

SECTION 5 – FIRE-FIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray, alcohol-resistant foam, dry chemical or carbon dioxide fire extinguishers.
Unsuitable extinguishing media: Direct water stream may cause frothing, splattering of burning material and spreading of fire.

Specific hazards arising from the chemical: Material may be ignited only if preheated to high temperatures (such in fire conditions). Fire in vicinity poses risk of pressure build-up and rupture. Containers at risk from fire should be cooled with water and, if possible, removed from the danger area. Hazardous combustion products: carbon and nitrogen oxides, oxides of metals present in mixture, amines, hydrogen cyanide, lower molecular weight organic molecules.

Special Protective Equipment and Precautions for fire-fighters: Wear NIOSH or OSHA approved self-contained breathing apparatus in positive pressure mode with full face piece and full protective gear. Isolate the scene by removing all persons from the incident area. No action should be taken involving any personal risk or without suitable training. Spilled product will cause very slippery walking surfaces.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Keep unnecessary and unprotected personnel from entering. Ensure adequate ventilation/exhaust extraction. Avoid breathing vapors or mist during clean up. Use protective equipment as described in Section 8. Do not touch or walk through spilled material; spilled material may cause a slipping hazard.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Inform the relevant authorities if the product has caused environmental pollution. Water polluting material. Toxic to the environment. See Section 12.

Methods and materials for containment and cleaning up: Remove mechanically; cover the remainder with non-combustible absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth). Following absorption, transfer into properly labeled chemical waste containers. If necessary, repeat application of absorbent material until all liquid has been removed from the surface. Wash the spill site with soap and water. Cover container and remove from work to a well-ventilated area. Properly dispose of the waste material and any contaminated equipment (i.e., broom or brush) in accordance with existing federal, state and local regulations.
For major spills: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Wash spillages into an effluent treatment plant or contain and collect with an absorbent material as described in the previous paragraph.
For minor spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly with soap and water to remove residual contamination. Never return spills to original containers for re-use.

Residues from spill cleanup may continue to be regulated under provisions of RCRA and require storage and disposal as hazardous waste. For major spills, see Section 1 for the Emergency contact; for further disposal measures, see Section 13.

SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling: Protect chemical from atmospheric moisture. Avoid prolonged exposure to heat and air. Keep away from sources of ignition. Do not reseal if contamination is suspected.
Use adequate ventilation to keep airborne levels below the exposure limits. Do not breathe vapors and mists. Wear respiratory protection if material is heated, mixed, sprayed or used in a confined space. Avoid contact with skin and eyes. Wear appropriate eye and skin protection. Wash hands thoroughly after handling. Hands and/or face should be washed before eating, drinking and smoking and at the end of the shift. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilities: Store in original or approved alternative container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink.
Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Protect it against physical damage and moisture. Normal temperature and pressures do not affect the material. Keep liquid away from heat, sparks and flame. Do not cut, drill, grind, weld or perform similar operations on or near containers. Use appropriate containment to avoid environmental contamination. Segregate from acids and acid forming substances.

Storage stability: Stable under normal conditions.
Storage temperature: 60 - 90°F (16 – 32°C)

Employee education and training in the safe use and handling of this product are required under the OSHA Hazard Communication Standard 29 CFR 1910.1200. Employees and consumers should be warned of health risks associated with product use.
See Section 8 for additional information on hygiene measures.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters/Occupational exposure limit values: Not available for mixture. Results for components are listed in Section 15.

Appropriate engineering controls: Good local and general ventilation should be sufficient to control worker exposure to airborne contaminants below recommended exposure limits. Local exhaust may be required in some areas.

Personal protective equipment:

Eye/face protection:

When directly handling liquid product, eye protection is required. Examples of eye protection include safety glasses and goggles or full face shield when there is a greater risk of splash. Contact lenses should not be worn when working with chemicals.

Skin/body protection:

Avoid contact with skin. Impervious gloves (nitrile butyl rubber, neoprene and PVC) should be worn always when working with this product. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact. Dispose contaminated gloves after use in accordance with good laboratory practices. Body should be covered with appropriate clothing (apron, arm covers or full body suit) depending on the task being performed and the risks involved. Protective clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH. Wash contaminated clothing before reuse. Store work clothing separately. Appropriate footwear should be also selected based on the task being performed and the risks involved.

Respiratory protection:

Use local or general ventilation to control exposures below applicable exposure limits. When ventilation is inadequate, use either an atmosphere supplying respirator or NIOSH or OSHA approved air-purifying respirator for organic vapors. Respirator

must be properly fitted and its selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Additional Protective Measures: Educate and train employees in safe handling of this product. Follow all label instructions. As a general hygiene practice, wash hands and face after use. Emergency eyewash fountains and safety shower should be in close proximity as a matter of good practice.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Green Liquid
Odor:	Mild
Odor threshold:	Not available
pH:	8 – 10
Melting point/ freezing point:	Not available
Initial boiling point and boiling range:	>200°C
Flash point:	>200°C
Evaporation rate:	Not applicable
Flammability (solid, gas):	Not applicable
Upper/ lower flammability or explosive limits:	Not applicable
Vapor pressure:	Negligible
Vapor density:	Not available
Relative density:	1.00-1.05 @ 25°C (77°F)
Solubility (water):	Very slightly soluble
Partition coefficient n-octanol/water:	Not available
Auto-ignition temperature:	>250°C
Decomposition temperature:	Not available
Viscosity:	Not available

SECTION 10 – STABILITY AND REACTIVITY

Reactivity: Product will not undergo hazardous polymerization. Corrosive effects to metal are not anticipated. Based on its structural properties the product is not classified as oxidizing. Does not form flammable gases in the presence of water.

Chemical stability: Stable under recommended storage conditions. Product is hygroscopic; contamination with moisture will negatively affect product performance. Avoid unintended contact with isocyanates; the reaction will generate heat.

Conditions to avoid: Unintentional contact with moisture, excessive heat, open flame and sparks. Avoid mist formation.
Incompatible materials: Strong oxidizing agents. Water, alcohols, amines, bases, acids, copper, aluminum and zinc alloys.

Hazardous decomposition products: Depend upon temperature, air supply and presence of other materials. Can include, but are not limited to carbon and nitrogen oxides, oxides of metals present in mixture, amines, hydrogen cyanide, lower molecular weight organic molecules.

SECTION 11 – TOXICOLOGICAL INFORMATION

Likely Routes of Exposure: Skin and Eye Contact, Inhalation and Ingestion.
Symptoms of exposure:
Acute toxicity:
Oral: May be harmful if swallowed. Adverse symptoms may include abdominal pain, nausea, vomiting, and diarrhea.
Dermal: May be harmful in contact with skin. Adverse symptoms may include irritation and redness.
Inhalation: Inhalation is unlikely due to the low vapor pressure. However, if handled at elevated temperatures, it may give off-gas, vapor or mist that is very irritating to the respiratory system. Adverse symptoms may include nausea, headache, difficulties with breathing.
Skin corrosion / irritation:
Corrosive! Damages skin if not removed immediately. A more severe response may be expected if skin is abraded (scratched or cut).
Serious eye damage / eye irritation:
May cause serious eye damage. Adverse symptoms may include tearing, redness, swelling and burning. Dispersed pigment may cause abrasion of the cornea.
Specific target organ toxicity, single exposure:
Not classified. This product contains components that may cause respiratory irritation after single exposure; however their amount is not sufficient for product classification.
- Confidential Component 2, CAS #: Trade Secret: may cause respiratory irritation.
- Confidential Component 3, CAS #: Trade Secret: may cause respiratory irritation.

Aspiration hazard:
Not an aspiration hazard.

Chronic toxicity:

Respiratory and Skin Sensitizer:

This product contains a component that is reported to be a skin or respiratory sensitizer.

- Confidential Component 1, CAS #: Trade secret: skin sensitizer.

Germ cell mutagenicity:

Risk to humans is not expected from exposure to this product.

Carcinogenicity:

This product contains components reported to be possibly carcinogenic to humans by IARC.

- Titanium dioxide, CAS #: 13463-67-7: IARC: Group 2B (Possibly Carcinogenic to Humans)
- Carbon Black, CAS #: 1333-86-4: IARC: Group 2B (Possibly Carcinogenic to Humans):
- Zeolites, CAS #: 1318-02-1: IARC: Group 3 (Not Classifiable as to its Carcinogenicity to Humans)

Negative effects of the components classified as possible carcinogen to humans are minimized since they are dispersed in a liquid as opposed to an inhalable fine powder form. However, precautions should be taken to avoid breathing mists created by heating, mixing or spraying and dust from cutting or grinding of cured product containing these components.

Reproductive toxicity:

Risk to humans is not expected from exposure to this product.

Specific target organ toxicity, repeated exposure:

Liver, kidney, respiratory system/lungs.

Medical conditions aggravated by overexposure:

Liver, kidney, respiratory system/lungs and skin disorders if product is handled without adequate protection.

Toxicity test results: Not available for mixture. Results for components:

Components	Test Results
Polyether Polyol, CAS #: 9082-00-2	Non-hazardous Acute Toxicity Oral LD50 (Rat): >5,000 mg/kg; may cause mild gastrointestinal effects including nausea and diarrhea. Dermal LD50 (Rabbit): >2,000 mg/kg Inhalation LC50 (Rat), 1hr: >200 mg/L; not expected to cause any significant respiratory tract effects. Skin corrosion/irritation (Rabbit): may cause slight irritation, but not expected to cause serious damage. Serious eye damage/eye irritation (Rabbit): may cause irritation (redness), but not expected to cause serious damage. STOT, SE: risk to humans is not expected from exposure to this product. Aspiration hazard: No Chronic toxicity Sensitization, skin and respiratory: Not sensitizer Germ cell mutagenicity: Risk to humans is not expected from exposure to this product. Carcinogenicity: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, NTP, OSHA and ACGIH. Reproductive toxicity: Risk to humans is not expected from exposure to this product. STOT, RE: No known or reported target organs from repeated exposure.
Diethylene Glycol, CAS #: 111-46-6	Acute Toxicity Oral LD50 (Rat): 1,120 mg/kg; moderately toxic after single ingestion Dermal LD50 (Rabbit): 11,890 mg/kg Inhalation LC50 (Rat), 4hr: >4.6 mg/L; not expected to cause any significant respiratory tract effects. Skin corrosion/irritation (Human), 24hrs: not irritating (Patch test) Serious eye damage/eye irritation (Rabbit): not irritating STOT, SE: No data available. Aspiration hazard: No Chronic toxicity Sensitization, skin and respiratory (Guinea pig): Not skin sensitizer (GPMT) Germ cell mutagenicity: negative in vitro and in vivo test Carcinogenicity (Rat, Oral), 108 weeks: NOAEL: 1,210 mg/kg bwt; No evidence of carcinogenicity. Reproductive toxicity: Fertility (Rat, Oral) two generation study: NOAEL: 2,200 mg/kg bwt; Fetal Development (Rabit, Oral), 30days: NOAEL: 1,000 mg/kg bwt; No reproductive effects. Has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals. Other animal studies have not reproduced birth defects even at much higher doses that caused severe maternal toxicity. STOT, RE (Rat, Oral), 4weeks/daily: NOAEL: 10,000 mg/kg - Kidney damage; Category 2
Tris (2-chloro-1-methylethyl) phosphate, CAS #: 13674-84-5	Acute Toxicity Oral LD50 (Rat), 24hrs: >1,101 mg/kg (OECD Test Guideline 401) Dermal LD50 (Rabbit), 24 hrs: >2,000 mg/kg Inhalation LC50 (Rat), 4hrs : >7 mg/L; Skin corrosion/irritation (Rabbit), 24hrs: Non-irritating (OECD Test Guideline 404) Serious eye damage/eye irritation (Rabbit), 72hrs: Non-irritating (OECD Test Guideline 405) Aspiration Hazard: No Chronic toxicity Skin Sensitization (Mouse): negative (OECD Test Guideline 429) Reproductive Toxicity: Teratogenicity: Rat Dietary study; NOEL = 1000 mg/kg/day Carcinogenicity: Not observed
Confidential Component 1, CAS #: Trade Secret	Acute Toxicity Oral LD50 (Rat): 300-2,000 mg/kg (OECD Test Guideline 401) Dermal LD50: (Rat): >2,000 mg/kg (OECD Guideline 402) Inhalation LC50 (Rat), 4hr: > 5.0 mg/L (OECD Guideline 403); Skin corrosion/irritation (Rabbit), 24hrs: Corrosive (OECD Test Guideline 404) Serious eye damage/eye irritation (Rabbit), 24hrs: Corrosive (OECD Test Guideline 405) STOT, SE: no data available. Aspiration hazard: no data available. Chronic Toxicity Respiratory or skin sensitization (Guinea pig): skin sensitizer (OECD Guideline 406)

	Germ cell mutagenicity: Not mutagenic in bacteria, mammalian cell culture and test with mammals. Carcinogenicity: Negative in animal experiments. No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, NTP, OSHA and ACGIH. Reproductive toxicity: Data from an oral 90-day study in rats according to OECD TG 408 did not reveal any adverse effects on the male and female reproductive organs. Did not show any teratogenic or embryofetotoxic effects in a gavage study with rats performed in accordance with OECD TG 414 (2001) up to and including the highest tested dose level of 250 mg/kg bw/day. The NOAEL for maternal toxicity was 50 mg/kg bw/day, effects at 250 mg/kg bw/day were reduced food consumption and reduced body weight gain. The NOAEL for developmental toxicity is 250 mg/kg bw/day. STOT, RE: From two 14-day inhalative exposure studies with rats no NOAEL could be determined. At the first study's LOAEL of 18 mg/m^3 , degeneration/necrosis in the olfactory epithelium of the nose were observed. Trachea, larynx and lungs were affected at 200 mg/m^3 and above (degeneration/ necrosis, hyperplasia, squamous metaplasia). At the LOAEL of the follow-up study, i.e. at 2.2 mg/m^3, reversible minimal to mild degeneration of respiratory nasal mucosa in the anterior dorsal nose was observed. In a subchronic drinking water study according to OECD TG 408, the administration of 150 mg/kg bw/day led to reduced absolute and relative kidney weights in male and female rats (histopathology being indicative for tubular nephrosis), while 59 mg/kg bw/day (males) and 62 mg/kg bw/day (females) were determined as a NOAEL.
Confidential Component 2, CAS #: Trade Secret	Acute Toxicity: Oral LD50 (Rat): >2,000 mg/kg (OECD Test Guideline 423); Nausea, Vomiting, Constipation. Dermal LD50 (Rat): No data available. Inhalation LC50: No data available. Skin corrosion/irritation (Rabbit), 4hrs: Causes skin irritation. Serious eye damage/eye irritation (Rabbit): Causes serious eye irritation. STOT, SE: May cause respiratory irritation. Aspiration hazard: No. Chronic toxicity: Sensitization, skin and respiratory (Guinea pig): Does not cause skin sensitization. (OECD Test Guideline 406, GPMT) Germ cell mutagenicity (Mouse): negative (lymphocyte); (Rat): negative (micronucleus test) Carcinogenicity: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, NTP, OSHA and ACGIH. Reproductive toxicity: No data available STOT, RE: No data available.
Confidential Component 3, CAS #: Trade Secret	Acute Toxicity Oral LD50 (Rat): 5,625 mg/kg Dermal LD50 (Rabbit): > 3160 mg/kg Inhalation LC50 (Rat), 1hr: No data available. Skin corrosion/irritation (Rabbit): Causes skin irritation. Serious eye damage/eye irritation (Rabbit): Causes eye irritation. STOT, SE: May cause respiratory irritation. Aspiration hazard: No. Chronic toxicity Sensitization, skin and respiratory: Not sensitizer. Germ cell mutagenicity: No data available. Carcinogenicity: No data available. Reproductive toxicity: No data available. STOT, RE: No data available.
Zeolites, CAS #: 1318-02-1	Acute Toxicity Oral LD50 (Rat): >5,110 mg/kg (OECD Guideline 401); May cause gastrointestinal tract irritation. Dermal LD50 (Rabbit): Not data available Inhalation LC50 (Rat)(dust/aerosol), 4hrs : >5.3 mg/L. Slightly irritant. Skin corrosion/irritation (Rabbit): Slightly irritant. May cause dehidratation. Serious eye damage/eye irritation (Rabbit): Slightly irritant. May cause abrasion or mechanical irritation. STOT, SE: risk to humans is not expected from exposure to this product. Aspiration hazard: No Chronic toxicity Sensitization, skin and respiratory: Not sensitizer (Guinea pig maximization test) Germ cell mutagenicity: Risk to humans is not expected from exposure to this product. Carcinogenicity: IARC: Group 3 (Not Classifiable as to its Carcinogenicity to Humans) Reproductive toxicity: No adverse effects in rats and rabbits or their offspring following administration in the drinking water during pregnancy. STOT, RE: Effects on kidney were observed in rats and dogs administered high dose levels in their feed for one month. Effect on blood, chronic pneumonitis and acute bronchopneumonia were observed in dogs. Long-term inhalation by rats and dogs produced inflammation in the lungs associated with accumulation of particulate.
Titanium Dioxide, CAS #: 13463-67-7	Acute toxicity Oral LD50 (Rat): >5,000 mg/kg; a very insoluble compound. The studies in several species, including man, show neither significant absorption nor tissue storage following ingestion of titanium dioxide. Inhalation LC50 (Rat): >6.82 mg/L Skin corrosion/irritation (Rabbit): Slight or no skin irritation. Not dermally absorbed by humans. Serious eye damage/eye irritation (Rabbit): Slight or no eye irritation. Chronic Toxicity Sensitization (Mouse): Not sensitizing on laboratory animals. Germ cell mutagenicity: Non genotoxic. Carcinogenicity: IARC: Group 2B: Possibly carcinogenic to humans; No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by NTP, ACGIH and OSHA. Titanium dioxide is a frequently used compound in lung clearance studies, where a biologically inert substance is required, however inhalation of high concentrations of fine or ultrafine titanium dioxide particles has been shown to result in pulmonary inflammation, fibrosis, and lung tumors in rats. The same inhalation effects were not observed in mice and hamsters and may be a rat-specific threshold phenomenon, dependent upon lung overloading at high exposure concentrations and possibly of little relevance to humans. Epidemiological data suggest that there is no carcinogenic effect associated with workplace exposure to titanium dioxide dust. STOT, RE: Inhalation: Lung fibrosis; potential occupational carcinogen
Carbon Black, CAS #: 1333-86-4	Acute Toxicity Oral LD50 (Rat): >8,000 mg/kg; Carbon Black is inert, insoluble and is not expected to present an ingestion hazard Skin corrosion/irritation (Rabbit): non- irritating, index score 0.6/8 (4 = severe edema) Eye irritation (Rabbit): non-irritating, Draize score 10-17/110 (100 maximally irritating) Chronic toxicity: Germ cell mutagenicity: In Vitro: not suitable to be tested in bacterial (Ames test) and other in-vitro systems because of its insolubility. When

	tested, however, results for carbon black showed no mutagenic effects. Organic solvent extracts of carbon black can, however, contain traces of polycyclic aromatic hydrocarbons (PAHs). A study to examine the bioavailability of these PAHs showed that PAHs are very tightly bound to carbon black and not bioavailable. / In Vivo - In an experimental investigation, mutational changes in the hprt gene were reported in alveolar epithelial cells in the rat following inhalation exposure to carbon black. This observation is believed to be rat specific and a consequence of "lung overload" which led to chronic inflammation and release of oxygen species. This is thus considered to be a secondary genotoxic effect and thus carbon black itself would not be considered to be mutagenic. Carcinogenicity: IARC: Group 2B: Tumor development in rats caused by lung overload. No epidemiological evidence for lung tumors in humans. Lung tumors in rats are the result of exposure under "lung overload" conditions. The development of lung tumors in rats is specific to this species. Mouse and hamster do not develop lung tumors under similar test conditions. The European CLP guidance on classification and labelling states, that „lung overload" in animals is listed under mechanism not relevant to humans and that no classification is necessary if the mechanism is not relevant to humans. ACGIH: Group A4 - Not classifiable as a human carcinogen. NIOSH: 1978 criteria document on carbon black recommends that only carbon blacks with PAH contaminant levels greater than 0.1% require the measurement of PAHs in air. As some PAHs are possible human carcinogens, NIOSH recommends an exposure limit of 0.1 mg/m³ for PAHs in air, measured as the cyclohexane-extractable fraction. Not listed as a human carcinogen by NTP and OSHA. Inhalation (Rat/Mouse), 2 years, Target organ: lungs; Effect: inflammation, fibrosis, tumors; Oral (Rat), 2 years: no tumors; Oral (Mouse), 2 years: no tumors; Dermal (Mouse), 1.5 years: no skin tumors; Inhalation (Mouse/hamster), 1-2 years Target organ: lungs: no tumors; Inhalation (Rat), 2 years Target organ: lungs: inflammation, fibrosis, tumors. Reproductive toxicity: No experimental studies are available. However, based on toxicokinetic data, carbon black is deposited in the lungs and based on its specific physicochemical properties (insolubility, low absorption potential), it is not likely to distribute in the body to reach reproductive organs, embryo and/or fetus under in vivo conditions. Therefore, no adverse effects to fertility/reproduction or to fetal development are expected. STOT, RE: Inhalation (Rat), 90 days, Target organ: lungs, NOAEL = 1.1 mg/m³ (respirable)-Effect: inflammation, hyperplasia, fibrosis; Prolonged or repeated inhalation of dust may cause pulmonary fibrosis or emphysema. Inhalation studies with the rat showed lung effects. These effects are believed to be the effects of "lung overload" and specific to the species.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: Not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment. Do not release into natural waters.

Persistence and degradability: Not readily biodegradable by OECD criteria. In contact with water the substance will hydrolyze slowly.

Bioaccumulative potential: No significant accumulation in organisms is expected.

Mobility in soil: Not expected.

Other adverse effects: Not known.

Ecotoxicity test results: Not available for the mixture. Results for components:

Components	Test Results
Polyether Polyol, CAS #: 9082-00-2	Acute Toxicity: Fish: LC 50, 96hrs: >100 mg/L (based on available data and comparison to similar compounds)
Diethylene Glycol, CAS #: 111-46-6	Acute Toxicity Fish: LC50 (fathead minnow), 96hrs: 75,200mg/L (flow-through test) Aquatic invertebrates: EC50 (Daphnia magna), 24hrs: >10,000 mg/L (static test) Aquatic plants: EC50 (green algae), 96hrs: 6,500 - 13,000 mg/L (growth rate inhibition) (similar substance) Ecological Data Biodegradability (Activated sludge, aerobic), 28days: 90-100% - Readily biodegradable (OECD Test Guideline 301B) Bioaccumulative potential: log Pow: -1.98 Mobility in soil: No data available.
Tris (2-chloro-1-methylethyl) phosphate , CAS #: 13674-84-5	Acute Toxicity Fish: LC50 (fathead minnow), 96hrs: 51mg/L (OECD 203, static) Aquatic invertebrates: EC50 (Daphnia magna), 48hrs: 131 mg/L (OECD Test Guideline 202) Aquatic Plants:EC50 (algae), 72hrs: 82 mg/L (growth rate), (OECD Test Guideline 201) Microorganisms: EC50 (bacteria), 3hrs: 784 mg/L (ISO 8192) Chronic toxicity Aquatic invertebrates (Daphnia magna), 21 days NOEC: 32 mg/L Aquatic Plants ErC10 (algae), 72hrs: 42 mg/L (growth rate), (OECD Test Guideline 201) Ecological Data Biodegradation, 28days: 14 % - Not readily biodegradable (OECD Guideline 301C)
Confidential Component 1, CAS #: Trade Secret	Acute toxicity Fish: LC50 (golden orfe/), 96hrs: >100 mg/L (Directive 84/449/EEC, C.1) Aquatic invertebrates: EC50 (Daphnia magna), 48hrs: 10-100 mg/L (OECD Guideline 202, part 1, static) Aquatic plants: EC50 (green algae), 72hrs: >50 mg/L (growth rate) (Directive 88/302/EEC, part C, p. 89 /EC50) Microorganisms: EC10 (bacterium), 18hrs: >1,000 mg/L (DIN 38412 Part 8) Ecological Data Biodegradation: DOC reduction, 28days: 8% (Directive 92/69/EEC, C.4-A (aerobic)) DOC reduction 42% (OECD 303A; ISO 11733; 92/69 EEC,V, C.10 (aerobic), activated sludge) Poorly biodegradable. Moderately/partially eliminated from water. Bioaccumulation: Not expected, based on n-octanol/water distribution coefficient (log Pow) Adsorbable organically-bound halogen (AOX): This product does not contain organically-bound halogen. Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
Confidential Component 2, CAS #: Trade Secret	Acute Toxicity: Acute Aquatic Toxicity Score: Low based on LC50 values > 100 mg/L. Fish, 96hrs: LC50: > 100 mg/L (ESIS 2000) Aquatic Invertebrates (Daphnia magna), 48hrs: > 100 mg/L (ESIS 2000) Aquatic Plants (algae), 72hrs: EC50: > 100 mg/L (ESIS 2000) Chronic toxicity: Chronic Aquatic Toxicity Score: Medium based on GHS criteria for chronic aquatic toxicity. There were no data identified on the chronic aquatic toxicity of aluminum hydroxide. The globally harmonized system (GHS) Categorization of poorly soluble substances for which no chronic or acute toxicity data exist are classified as chronic aquatic toxicity category 4, a "safety net"

	category. The Green Screen assigns these chemicals a rating of "moderate." Ecological data: Persistence and degradability: Not readily biodegradable. Persistence Score: Very high based on the chemical being an inorganic compound and not having any identifiable biodegradation pathways at normal environmental conditions. As an oxidized inorganic compound, aluminum trihydroxide is not expected to biodegrade, oxidize further in air, or undergo hydrolysis at environmental conditions. No degradation process for aluminum trihydroxide could be identified at typical environmental conditions (US EPA 2008). Bioaccumulative potential: Not expected to be bioaccumulative (U.S. EPA 2008). Bioaccumulation Score: Low based on a BCF value < 100. Aluminum hydroxide has a predicted BCF of 3.2 (U.S. EPA 2008). Mobility in soil: Not expected.
Confidential Component 3, CAS #: Trade Secret	Acute toxicity Fish: LC50 (Zebra fish), 96hrs (OECD Test Guideline 203): 100-1,000 mg/L Aquatic invertebrates: No data available Aquatic plants: No data available Ecological Data Persistence and degradability: Inorganic substance. Does not cause biological oxygen consumption. Bioaccumulative potential: No data available. Mobility in soil: No data available. May contribute to eutrophication in static waters, therefore should not be released into surface waters. Can be eliminated from water by abiotic process, eg. adsorption on activated sludge.
Zeolites, CAS #: 1318-02-1	Acute Toxicity: Fish (fathead minnow), 96hrs: LC50: >680 mg/L (EPA 72-1, static). The details of the toxic effect relate to the nominal concentration. The LC50 is higher than the solubility limit. Aquatic invertebrates (Daphnia magna), 24hrs: EC50: 2,808 mg/L (OECD Test Guideline 202, part 1, static) Aquatic plants (Green algae), 96hrs: EC50: >328 mg/L (OECD Test Guideline 201, static). The details of the toxic effect relate to the nominal concentration. Tested above maximum solubility. The product has low solubility in the test medium. An eluate has been tested. Microorganisms (Bacteria), 16hrs: EC50: 950 mg/L (Growth inhibition) (DIN 38412, Part 8). The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An eluate has been tested. Chronic toxicity: Fish (fathead minnow), 30days: NOEC: ≥86.7 mg/L (OPP 72-5, EPA-Guideline, Flow through). The statement of the toxic effect relates to the analytically determined concentration. Aquatic invertebrates (Daphnia magna), 21days: NOEC: 32 mg/L (OECD Test Guideline 211, semi-static). The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An eluate has been tested. Ecological Data: Biodegradability: Not readily biodegradable. The product is virtually insoluble in water and can thus be separated from water mechanically in suitable effluent treatment plants. It cannot be eliminated from water by biological purification processes. Mobility in soil: Transport between environmental compartments: Study scientifically not justified.
Titanium Dioxide, CAS #: 13463-67-7	Aquatic toxicity: Fish LC0 (orfe, freshwater fish), 48h: >1,000 mg/L. Ecological Data: Persistence and degradability: Methods for the determination of biodegradability are not applicable to inorganic substances. Bioaccumulative potential: The product is practically insoluble in water and not biodegradable. Mobility in soil: No data available. PBT and vPvB assessment is not required for inorganic substances. Titanium dioxide is a stable compound that is insoluble in water and therefore would not be expected to be present in drinking water. Based on the lack of absorption as well as no identified toxicological effects of concern in animal testing, there are also no risk concerns for non-target terrestrial organisms resulting from the use of titanium dioxide as an inert ingredient.
Carbon Black, CAS #: 1333-86-4	Acute toxicity Fish: LC50 (Zebra fish), 96hrs (OECD Test Guideline 203): >1,000 mg/L Aquatic invertebrates: EC50 (Daphnia magna), 24hrs (OECD Test Guideline 202): >5,600 mg/L Aquatic plants: EC50 (Algae), 72hrs (OECD Test Guideline 201): >10,000mg/L; NOEC 50: >10,000 mg/L Ecological Data Activated sludge, EC0, 3hrs (TTC test, DEV L3): 800 mg/L Persistence and degradability: Effects are not expected due to its stability and insolubility in water or organic solvents. Carbon black is inert elemental carbon and cannot be further biodegraded by microorganisms, hydrolysis, photo-degradation in air or in surface water. Bioaccumulative potential: No significant accumulation in organisms is expected. Not expected to occur in air or water in relevant amounts due to stability, insolubility and low vapor pressure. The deposition in soil or sediments is the most possible fate in the environment.

SECTION 13 – DISPOSAL CONSIDERATIONS

Product Disposal: The generation of waste should be avoided or minimized wherever possible. If product becomes a waste, it does not meet criteria of hazardous waste as defined in 40 CFR 261, Subpart C and D. Do not discharge into sewer system. Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose waste in compliance with local, state and federal regulations via licensed waste disposal contractor.

Container disposal: Even after emptying, container may retain residues. Empty containers should be completely drained and safely stored until appropriately reconditioned or disposed through licensed contractor in accordance with government regulation.
This material and its container must be disposed of in a safe way.

SECTION 14 – TRANSPORT INFORMATION

Land transport, U.S. DOT: Non-regulated
Sea transport, IMDG: Non-regulated
Air transport, IATA/ICAO: Non-regulated

SECTION 15 – REGULATORY INFORMATION

U.S. Regulations:
OSHA HCS: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29CFR 1910.1200.

TSCA Regulations:

All components of this product are listed or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

EPCRA Section 302 (40 CFR Part 355) (Emergency Response Planning, Extremely Hazardous Substance):

No components are subject to the reporting.

EPCRA Section 304 (40 CFR Part 355) (Emergency Release Notification Requirements):

No components are subject to the reporting.

EPCRA Sections 311 & 312 (Hazardous Chemical Inventory Reporting, Hazard Categories):

Acute Health Hazard, Chronic Health Hazard

EPCRA Section 313 (40 CFR Part 372) (Toxic Chemical Release Inventory Reporting):

No components are subject to the reporting.

CERCLA Sections 102-103 (40 CFR Part 302) (Hazardous Substances Release Notification):

No components are subject to the reporting.

Clean Air Act:

- Ozone Depleting Substances (ODS): This product does not contain and is not manufactured with ozone depleting substances.
- Hazardous Air Pollutants, OSHA, Section 112(b), Table Z-1: The following components are listed:

Substance		Regulatory Limits			Recommended Limits	
		OSHA PEL		Cal/OSHA PEL	NIOSH REL	ACGIH® 2015 TLV®
		ppm	mg/m^3	8-hour TWA, mg/m^3	Up to 10-hour TWA, mg/m^3	8-hour TWA, mg/m^3
Hydrated Aluminum Silicate (Kaolin), CAS #: 1332-58-7	Total dust	-	15	-	10	-
	Respirable fraction	-	5	2 *	5	2 *
Aluminum Oxide, CAS #: 1344-28-1	Total dust	-	15	10	-	-
	Respirable fraction	-	5	5	-	-
Titanium Dioxide, CAS #: 13463-67-7	Total dust	-	15	10 (as PNOR)	2.4 mg/m^3 (fine) 0.3 mg/m^3 (ultrafine), Ca See Appendix A & C	10
Iron Oxide, CAS #: 1309-37-1		-	10 (fume)	5 (fume)	5 (dust and fume)	5 (resp.)
Carbon Black, CAS #: 1333-86-4		-	3.5	3.5	3.5 mg/m^3 (without PAHs); when PAHs are present, NIOSH considers carbon black to be a potential occupational carcinogen.	3 mg/m^3 (IHL)

ppm-parts per million; *- no asbestos and <1% Crystalline Silica; Ca - Potential occupational carcinogens; Appendix A, C and D refers to Appendixes of HAP List, Section 112(b) of Clean Air Act
* - Chemicals listed as Hazardous Air Pollutants (HAPs) that are not listed in Section 3 are present only as impurities at quantities below 0.1%, not relevant for GHS classification.

NIOSH IDLH: Titanium dioxide, CAS #: 13463-67-7: 5,000 mg/m^3, Ca
Carbon Black, CAS #: 1333-86-4 in the presence of PAHs: 1,750 mg/m^3 / TWA: 0.1 mg PAH s/m^3

Clean Water Act:

- Section 307(a) (Toxic pollutants): No components are listed.
- Section 311(b)(2): Table 116.4A (Hazardous chemicals) / Table 117.3 (RQ): No components are listed.

NFPA rating: Health: 2 Fire: 1 Reactivity: 1 Special: 0
HMIS rating: Health: 2* Flammability: 1 Physical hazard: 1

State Regulations:

California Prop. 65 Components:

This product contains chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

- Titanium dioxide (airborne, unbound particles of respirable size), CAS #: 13463-67-7
  - causes cancer; Date listed: September 2, 2011
- Carbon Black (airborne, unbound particles of respirable size), CAS #: 1333-86-4
  - causes cancer; Date listed: February 21, 2003

Instruction: for regulatory information on components of this mixture, check the appropriate state websites.

International Regulations/Inventories:

Canada: All ingredients of this product are listed or are exempt from the DSL.
WHMIS Classification (Controlled Products Regulations): Class D2B: Material causing other toxic effects
WHMIS Label Information:

CARBON BLACK: May cause discomfort to the respiratory tract, skin and eyes. The International Agency for Research on Cancer has classified carbon black as possibly carcinogenic to humans based on laboratory animal inhalation studies.
Avoid breathing dust and prolonged contact with skin and eyes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye protection. In case of contact: Wash skin thoroughly with soap and water. Flush eyes with plenty of water. See Material Safety Data Sheet for important additional information.

SECTION 16 – OTHER INFORMATION

LEGEND

GHS	Globally Harmonized System
CAS	Chemical Abstracts Services
EC	European Community
EPA	Environmental Protection Agency
OSHA	Occupational Safety and Health Administration

ACGIH	American Conference of Governmental Industrial Hygienists
NIOSH	National Institute of Occupational Safety and Health
PEL	Permissible Exposure Limits
TLV	Threshold Limit Value
REL	Recommended Exposure Limit
TWA	Time-Weighted Average
STEL	Short-term exposure limit
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
COD / BOD	Chemical Oxygen Demand / Biological Oxygen Demand
STOT, SE	Specific Target Organ Toxicity following Single Exposure
STOT, RE	Specific Target Organ Toxicity following Repeated Exposure
DOT	Department of Transportation
IMDG	International maritime dangerous goods code
IATA, ICAO	International Air Transport Association, International Civil Aviation Organization
TSCA	Toxic Substances Control Act
EPCRA	Emergency Planning and Community Right-to-Know Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
RQ	Reportable Quantity
EHS	Extremely Hazardous Substances
DSL	Domestic Substance List
WHMIS	Workplace Hazardous Materials Information System

Latest revision date: August 11, 2016
Date of the previous revision: October 22, 2015 – Preparation of SDS in accordance to the GHS requirements

Disclaimer: The data set forth in this sheet are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. Rhino Linings Corporation makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof.