



Material Safety Data Sheet

FOR INDUSTRIAL USE ONLY

Casco-Resin CR-5H

1. Product and company identification

Product name	Casco-Resin CR-5H
MSDS Number	000000000387
Product Type	Urea Formaldehyde Resin
Product use	Wood Adhesives, Composites, Laminates or Related Board Products
Manufacturer, Importer, Supplier	Momentive Specialty Chemicals Inc. 180 East Broad Street Columbus OH 43215 4information@momentive.com
Print date	05-JUN-2014
Telephone	For Emergency Medical Assistance Call Health & Safety Information Services, 1-866-303-6949 For Emergency Transportation Information CHEMTREC US Domestic (800) 424-9300 CHEMTREC International (703) 527-3887 CANUTEC CA Domestic (613) 996-6666 For additional health and safety or regulatory information, call 1 888 443 9466 .

Part of the CASCO® Brand of Adhesives and Resins from Momentive Specialty Chemicals

2. Hazards identification

Form	Liquid
Odor	slight formaldehyde
OSHA/HCS status	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	DANGER ! CAUSES DIGESTIVE TRACT BURNS. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY CAUSE RESPIRATORY TRACT AND EYE IRRITATION.

Potential acute health effects

Inhalation	Slightly irritating to the respiratory system. May cause sensitization by inhalation.
Ingestion	Corrosive to the digestive tract. Causes burns.
Skin	May cause irritation on prolonged or repeated contact. May cause sensitization by skin contact.

Eyes Slightly irritating to the eyes.

Potential chronic health effects

Chronic effects Some reports suggest that formaldehyde may cause respiratory sensitization, such as asthma, and that preexisting respiratory and skin disorders may be aggravated by exposure.

Carcinogenicity Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Target organs Review Section 2 and 11 for any additional assessments.

Over-exposure signs/symptoms

Inhalation Adverse symptoms may include the following: respiratory tract irritation, coughing, wheezing and breathing difficulties, asthma,

Ingestion Adverse symptoms may include the following: stomach pains, nausea or vomiting, unconsciousness, convulsion,

Skin Adverse symptoms may include the following: irritation, redness,

Eyes Adverse symptoms may include the following: irritation, watering, redness,

Medical conditions aggravated by over-exposure Pre-existing respiratory and skin disorders may be aggravated by over-exposure to this product.

See section 11 for more detailed information on health effects and symptoms.

3. Composition/Information on ingredients

<u>Ingredient name</u>	<u>CAS number</u>	<u>WT %</u>
Formaldehyde	50-00-0	1.0 - 5.0

*** Any applicable Canadian trade secret numbers will be listed in Section 15.*

4. First aid measures

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention immediately.

Skin contact Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. 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 get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. In the event of any complaints or symptoms, avoid further exposure.

Ingestion	Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Protection of first aid personnel	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
Notes to physician	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

See section 11 for more detailed information on health effects and symptoms.

5. Fire-fighting measures

Flammability of the product	In a fire or if heated, a pressure increase will occur and the container may burst.
<u>Extinguishing media</u>	
Suitable	Use an extinguishing agent suitable for the surrounding fire.
Not suitable	None known.
Special exposure hazards	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Hazardous combustion products	Decomposition products may include the following materials: carbon oxides,
Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7. Handling and storage

Handling Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. 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. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Solubility in water of urea resins can vary from infinite to insoluble depending on manufacturing procedure and age. Warm water helps in washing up resins with limited solubility.

8. Exposure controls/personal protection

<u>Ingredient name</u>	<u>Occupational exposure limits</u>
Formaldehyde	ACGIH TLV Ceiling 0.37 mg/m ³ 0.3 ppm
	OSHA PEL 8-hr TWA 0.75 ppm
	OSHA PEL STEL (15 mins) 2 ppm

Consult local authorities for acceptable exposure limits.

Recommended If this product contains ingredients with exposure limits, personal,

monitoring procedures	workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.
Engineering measures	Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Respiratory	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eyes	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

Form	Liquid
Flash point	Not applicable.
Auto-ignition temperature	Not applicable.
Flammable limits	
Lower:	Not applicable.
Upper:	Not applicable.
Color	Opaque, white
Odor	slight formaldehyde
pH	7.4 - 7.9 @ 21 °C(70 °F)
Boiling point	Approx. 102 °C(216 °F)
Freezing Point	See storage section
Relative density	1.2700 - 1.2900
Vapor pressure	Approx. 22 mm Hg @ 25 °C(77 °F)
Odor threshold	Not available
Viscosity	Dynamic- 400 - 640 cPs Brookfield

Solubility	Soluble
Partition coefficient: n-octanol/water	Not available
Evaporation rate	Approx. 0.3 (n-Butyl acetate=1)
Vapor density	Not available
Typical % solids	62.50 % (m)

10. Stability and reactivity

Stability	Hazardous polymerization may occur under certain conditions of storage or use.
Materials to avoid	Reactive or incompatible with the following materials: oxidizing materials, acids,
Hazardous decomposition products	Decomposition products may include the following materials: carbon monoxide, carbon dioxide, aldehydes (including formaldehyde), hydrogen cyanide particulate matter, other organic compounds,

11. Toxicological information

Acute toxicity

Product name

Casco-Resin CR-5H

LD50 Oral	Rat	> 2,001 mg/kg Estimated.
LC50 Inhalation	Rat	> 2501 ppm/1 h Estimated.
LD50 Dermal	Rabbit	> 2,001 mg/kg Estimated.

Acute toxicity

Ingredient name

Formaldehyde

LD50 Oral	Rat	800 mg/kg
LC50 Inhalation	Rat	0.578 mg/l 250 ppm/2 h
LD50 Dermal	Rabbit	270 mg/kg

Other Toxicological Information

Carcinogenicity

Conclusion/Summary

The National Toxicology Program (NTP) has listed formaldehyde as "reasonably anticipated to be a human carcinogen". The International Agency for Research on Cancer (IARC) has concluded that formaldehyde is "carcinogenic to humans". U.S. OSHA regulates formaldehyde as a potential human carcinogen. See the OSHA Formaldehyde Workplace Standard at 29 CFR 1920.1048 (the "OSHA Standard"). Safe handling and use instructions are provided in this MSDS and in the OSHA Standard. OSHA has identified 0.5 ppm, calculated as an eight-hour time-weighted average ("TWA") concentration, as the "Action Level". Please review and understand the guidance contained in this MSDS, and refer to the OSHA Standard for regulatory requirements that might be applicable to your operation and use. Many studies and other evaluations have been performed concerning formaldehyde's potential to cause cancer. To review some of these studies and for further information go to www.osha.gov/SLTC/formaldehyde; <http://monographs.iarc.fr>; <http://ntp-server.niehs.nih.gov>; <http://epa.gov/iris/subst/0419.htm>; and other authoritative websites.

Classification

Ingredient name

Formaldehyde

ACGIH	Suspected human carcinogen.
IARC	IARC Group 1, carcinogenic to humans
NTP	Possible
OSHA	OSHA cancer potential
EU	Limited evidence of a carcinogenic effect.

12. Ecological information**Environmental effects**

No known significant effects or critical hazards.

Aquatic ecotoxicity**Ingredient name**

Formaldehyde

Fresh water	Acute LC50 1.41 mg/l/4 d	Rainbow trout,donaldson trout
Fresh water	Acute LC50 1.51 mg/l/4 d	Bluegill

Biodegradability**Conclusion/Summary**

Biodegradation is expected to be very slow.

Other adverse effects

The material is a soil mobile liquid initially which will solidify on aging.

Bioaccumulation is negligible.

13. Disposal considerations**Waste disposal**

The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. Transport information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International transport regulations

Regulatory information	UN/NA number	Proper shipping name	Classes/*PG	Reportable Quantity (RQ)
CFR	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Formaldehyde)	Class 9 III	Formaldehyde
TDG		Non-regulated		
IMO/MDG	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. contains (Formaldehyde)	Class 9 III	Formaldehyde

*PG : Packing group

15. Regulatory information

US regulations

HCS Classification

Corrosive material, Sensitizing material, Carcinogen

U.S. Federal regulations

SARA 311/312 Classification Immediate (acute) health hazard, Delayed (chronic) health hazard, reactive

SARA 313 - Supplier Notification

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.

Formaldehyde - 50-00-0 (2.50%),

SARA 302 Extremely Hazardous Substances The following components are listed:

Formaldehyde,

State regulations

Massachusetts RTK Substances The following components are listed: Formaldehyde,

New Jersey RTK Hazardous Substances The following components are listed: Formaldehyde,

Pennsylvania RTK Hazardous Substances The following components are listed: Formaldehyde,

California Prop. 65: WARNING: This product contains a chemical known to the State of California to cause cancer. Formaldehyde - 50-00-0,

Canada

WHMIS (Canada)

Class D-1A: Material causing immediate and serious toxic effects (Very toxic).

Class D-2A: Material causing other toxic effects (Very toxic).

Class D-2B: Material causing other toxic effects (Toxic).

Class E: Corrosive material

Canadian lists

Canadian NPRI: The following components are listed: Formaldehyde,

International regulations

Chemical inventories

Europe inventory All components are listed or exempted.

Australia inventory (AICS) All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (ENCS) Not determined.

Japan inventory (ISHL) Not determined.

Korea inventory (KECI) All components are listed or exempted.

New Zealand Inventory (NZIoC) Not determined.

Philippines inventory (PICCS) All components are listed or exempted.

Canada inventory All components are listed or exempted.

United States inventory (TSCA 8b) All components are listed or exempted.

16. Other information

Hazardous Material Information System III (U.S.A.)

Health : 1

Flammability: 0

Physical hazards : 0

Chronic : *

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS®

materials may be purchased exclusively from J. J. Keller (800) 327-6868.
The customer is responsible for determining the PPE code for this material.

Prepared by	Product Safety & Regulatory Compliance Group, (614)225-4778
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Notice to reader

The information provided herein was believed by Momentive Specialty Chemicals ("Momentive") to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. All products supplied by Momentive are subject to Momentive's terms and conditions of sale. MOMENTIVE MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY MOMENTIVE, except that the product shall conform to Momentive's specifications. Nothing contained herein constitutes an offer for the sale of any product.

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Material Safety Data Sheet

FOR INDUSTRIAL USE ONLY

Cascoset FM-96A

1. Product and company identification

Product name : Cascoset FM-96A
MSDS Number : 000000103953
Material uses : Resins.
Product type : Catalyst
Validation date : 12/02/2014
Print date : 08/26/2015

Manufacturer, Importer, Supplier Hexion Inc.
180 East Broad Street
Columbus, Ohio
43215 USA

Contact person 4information@momentive.com

Telephone For additional health and safety or regulatory information, call 1 888 443 9466.

Emergency telephone number

For Emergency Medical Assistance
Call Health & Safety Information Services, 1-866-303-6949

For Emergency Transportation Information
CHEMTREC US Domestic (800) 424-9300
CHEMTREC International (703) 527-3887
CANUTEC CA Domestic (613) 996-6666

Part of the CASCO® Brand of Adhesives and Resins from Momentive Specialty Chemicals

2. Hazards identification

-Emergency overview

Physical state : Powder
Color : Tan.
Odor : Slight ammonia

Signal word : **DANGER!**
Hazard statements : COMBUSTIBLE DUST WHEN FINELY DIVIDED AND SUSPENDED IN AIR. FINE DUST CLOUDS MAY FORM EXPLOSIVE MIXTURES. PRODUCT CAN EXPLODE IF DUST CLOUD IS FORMED AND IGNITED. MINIMIZE AIRBORNE DUST. PREVENT DUST ACCUMULATION. ELIMINATE ALL FIRE/IGNITION SOURCES INCLUDING STATIC DISCHARGES NEAR PRODUCT/PACKAGE.

REFER TO HANDLING SECTION 7 OF THE MSDS FOR MORE INFORMATION. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER, BASED ON ANIMAL DATA.

- Precautionary measures** :
- Do not handle until all safety precautions have been read and understood. Obtain special instructions before use. Do not breathe dust. Do not ingest. Use only with adequate ventilation. Do not eat, drink or smoke when using this product. Avoid contact with eyes, skin and clothing. Keep away from heat, sparks and flame. Keep container tightly closed. Use personal protective equipment as required. Prevent dust accumulation. Wash thoroughly after handling.

Potential acute health effects

- Inhalation** : Irritating to respiratory system. May cause sensitization by inhalation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : Harmful if swallowed.
- Skin** : Slightly irritating to the skin. May cause sensitization by skin contact.
- Eyes** : Irritating to eyes.

Potential chronic health effects

- Chronic effects** : Contains material that can cause target organ damage. Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Carcinogenicity** : Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Target organs** : Contains material which causes damage to the following organs:
lungs
the nervous system
upper respiratory tract
skin
eye, lens or cornea

Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma
- Ingestion** : No specific data.
- Skin** : Adverse symptoms may include the following:
irritation
redness

- Eyes** : Adverse symptoms may include the following:
 pain or irritation
 watering
 redness
- Medical conditions aggravated by over-exposure** : Pre-existing respiratory and skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

Name	CAS number	% by weight
Kaolinite (H4Al2Si2O9)	1318-74-7	>=30 - <50
Wood Flour	-	>=10 - <30
Ammonium Chloride	12125-02-9	>=1 - <5
Ammonium Sulfate	7783-20-2	>=1 - <5
Tricalcium Phosphate	7758-87-4	>=1 - <5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first aid personnel** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5. Fire-fighting measures

- Flammability of the product** : Combustible solid that burns. Fine dust clouds may form explosive mixtures with air.

Extinguishing media

- Suitable** : Use water spray or mist, dry chemical, foam or CO2.
- Not suitable** : Do not use water jet.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
nitrogen oxides
sulfur oxides
halogenated compounds
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Special remarks on explosion hazards** : Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions). The ATEX Directive defines combustible powders as less than 500 microns in diameter. When processed with flammable liquids/vapors/mists, ignitable (hybrid) mixtures may be formed with combustible dusts. Ignitable mixtures will increase the rate of explosion pressure rise and the MIE will be lower than the pure dust in air mixture. The Lower Explosive Limit (LEL) of the vapor/dust mixture will be lower than the individual LELs for the vapors/mists or dusts. See NFPA 77 for additional guidance.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Minimize airborne dust and eliminate all fire/ignition sources. Clean up spill as soon as possible using procedures described below. Avoid breathing dust or mist. Shut off all ignition sources. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8 of SDS).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

- Small spill** : Move containers from spill area. Do not use air hoses for cleaning. Minimize dry sweeping to avoid generation of dust clouds. Vacuum dust-accumulating surfaces and remove to a chemical disposal area. Use spark-proof tools and explosion-proof equipment. Vacuums with explosion-proof motors should be used. Dispose of via a licensed waste disposal contractor.
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid creating dusty conditions and prevent wind dispersal. Do not use air hoses for cleaning. Minimize dry sweeping to avoid generation of dust clouds. Vacuum dust-accumulating surfaces and remove to a chemical disposal area. Use spark-proof tools and explosion-proof equipment. Vacuums with

explosion-proof motors should be used. Dispose of via a licensed waste disposal contractor. Note: see section 1 of SDS for emergency contact information and section 13 of SDS for waste disposal.

7. Handling and storage

Handling

- : Put on appropriate personal protective equipment (see section 8 of SDS). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing dust. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

COMBUSTIBLE DUST HANDLING PROCEDURES:

Combustible dusts at sufficient concentrations can form explosive mixtures with air. High dust concentrations should be avoided. Follow US NFPA Standard 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids," UK HSE Guidance HSG 103, approved Codes of Practice (ACOPS) established for Explosive Atmospheres under the ATEX Directive 1999/92/EC for worker protection and ATEX Directive 94/9/EC that regulates equipment and protection systems used in potentially explosive atmospheres or other national guidance on safe handling of combustible dusts. Train workers in the recognition and prevention of hazards associated with combustible dust in the plant.

Minimize airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame. Establish good housekeeping practices. Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds. Use continuous suction at points of dust generation to capture and minimize the accumulation of dusts. Particular attention should be given to overhead and hidden horizontal surfaces to minimize the probability of a "secondary" explosion. According to NFPA Standard 654, dust layers 1/32 in. (0.8 mm) thick can be sufficient to warrant immediate cleaning of the area.

Control sources of static electricity. This product or the package itself can accumulate static charges, and static discharge can be a source of ignition. Solids handling systems must be designed in accordance with applicable NFPA standards (including 654 and 77) and other national guidance. Do not empty directly into flammable solvents or in the presence of flammable vapors. The operator, the packaging container and all equipment must be

grounded with electrical bonding and grounding systems. Plastic bags and plastics cannot be grounded, and antistatic bags do not completely protect against development of static charges.

- Storage** :
- Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10 of SDS) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep away from heat, hot surfaces, sparks and flame. 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. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient	Exposure limits
Kaolinite (H4Al2Si2O9)	<p>ACGIH TLV Time Weighted Average (TWA) 10 mg/m3 (inhalable particulate , Particles (Insoluble or Poorly Soluble) Not Otherwise Specified)</p> <p>OSHA PEL Time Weighted Average (TWA) 5 mg/m3 (respirable particulate)</p> <p>OSHA PEL Time Weighted Average (TWA) 15 mg/m3 (total dust)</p>
Wood Flour	<p>ACGIH TLV Time Weighted Average (TWA) 0.5 mg/m3</p> <p>ACGIH TLV Time Weighted Average (TWA) 1 mg/m3 (inhalable fraction , All other species (wood))</p> <p>OSHA PEL Time Weighted Average (TWA) 5 mg/m3 (respirable)</p> <p>OSHA PEL Time Weighted Average (TWA) 15 mg/m3 (total dust)</p>
Ammonium Chloride	<p>ACGIH TLV (1994-09-01) Time Weighted Average (TWA) 10 mg/m3 (Fume)</p> <p>ACGIH TLV (1994-09-01) Pollutant concentration that should not be exceeded during working hours and which workers are believed to be exposed during a period of 15 minutes maximum, without experiencing: a) irritation. b) chronic or irreversible tissue damage. c) dependent toxic effects of exposure rate. d) Narcosis of sufficient magnitude to increase susceptibility to accidents. e) The reduction of ability to get to safety by their own means. 20 mg/m3 (Fume)</p>

<p>Ammonium Sulfate</p>	<p>ACGIH TLV Time Weighted Average (TWA) 10 mg/m³ (inhalable particulate , Particles (Insoluble or Poorly Soluble) Not Otherwise Specified)</p> <p>OSHA PEL 1989 Vacated Time Weighted Average (TWA) 5 mg/m³ (respirable particulate , Particles (Insoluble or Poorly Soluble) Not Otherwise Specified)</p> <p>OSHA PEL 1989 Vacated Time Weighted Average (TWA) 15 mg/m³ (total dust , Particles (Insoluble or Poorly Soluble) Not Otherwise Specified)</p>
<p>Tricalcium Phosphate</p>	<p>OSHA PEL Time Weighted Average (TWA) 5 mg/m³ (respirable particulate)</p> <p>OSHA PEL Time Weighted Average (TWA) 15 mg/m³ (total dust)</p>

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
- Engineering measures** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

- Respiratory** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a

- risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles. If operating conditions cause high dust concentrations to be produced, use dust goggles.
 - Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. For PPE selection see National Fire Protection Association (NFPA) 2113, Standard on Selection, Care, Use and Maintenance of Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire.
 - Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state** : Powder
- Color** : Tan.
- Odor** : Slight ammonia
- Odor threshold** : Not available
- pH** : Not applicable.
- Melting point/freezing point** : Not applicable.
- Initial boiling point and boiling range** : Not applicable.
- Flash point** : Not applicable.
- Evaporation rate** : Not applicable.
- Flammability (solid, gas)** : Not available
- Burning time** : Not available
- Burning rate** : Not available
- Upper/lower flammability or explosive limits** : **Lower:** Not applicable.
Upper: Not applicable.
- Vapor pressure** : Not applicable.
- Vapor density** : Not available

- Relative density** : 0.4 - 0.7
- Solubility(ies)** : Not available
- Solubility in water** : Not available
- Partition coefficient: n-octanol/water** : Not available
- Auto-ignition temperature** : Not available
- Decomposition temperature** : Not available
- Viscosity** : **Dynamic:** Not available
Kinematic: Not available

9.2 Other information

No additional information.

10. Stability and reactivity

- Reactivity** : Stable under normal conditions.
- Chemical stability** : The product is stable.
- Conditions to avoid** : Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame).
Take precautionary measures against electrostatic discharges.
To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material.
Prevent dust accumulation.
See Section 7 Handling.
- Incompatible materials** : Reactive or incompatible with the following materials:
oxidizing materials
- Hazardous decomposition products** : Decomposition products may include the following materials:, carbon monoxide, carbon dioxide, aldehydes (including formaldehyde), oxides of nitrogen, particulate matter, other organic compounds Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ammonium Chloride				
	LD50 Oral	Rat	1,650 mg/kg	-
Ammonium Sulfate				
	LD50 Oral	Rat	2,840 mg/kg	-
	LD50 Dermal	Rat	> 2,000 mg/kg	-

Conclusion/Summary : Not available

Chronic toxicity

Conclusion/Summary : Not available

Irritation/Corrosion

Conclusion/Summary

Skin : Not available
Eyes : Not available
Respiratory : Not available

Sensitization

Conclusion/Summary

Skin : Not available
Respiratory : Not available

Carcinogenicity

Conclusion/Summary : Not available

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Wood Flour	A1, Wood dustsA2, Wood dustsA4, Wood dusts					

Mutagenicity

Conclusion/Summary : Not available

Teratogenicity

Conclusion/Summary : Not available

Reproductive toxicity

Conclusion/Summary : Not available

SECTION 12: Ecological information

12.1 Toxicity

Ecotoxicity : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
Kaolinite (H4Al2Si2O9)			
	Acute LC50 1,125,000 µg/l Fresh water	Aquatic invertebrates. Water flea	48 h
Ammonium Sulfate			
	Acute LC50 6.6 mg/l Fresh water	Fish - Rainbow trout,donaldson trout	96 h
	Acute LC50 > 20 mg/l Fresh water	Fish - Fathead minnow	96 h

Conclusion/Summary : Not available

12.2 Persistence and degradability

- Conclusion/Summary** : Not available
- Partition coefficient: n-octanol/water** : Not available
- Other adverse effects** : No known significant effects or critical hazards.

13. Disposal considerations

- Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

The data provided in this section is for information only and may not be specific to your package size or mode of transport. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

International transport regulations

Regulatory information	UN/NA number	Proper shipping name	Classes/*PG	Reportable Quantity (RQ)
CFR		Non-regulated		
TDG		Non-regulated		
IMO/IMDG		Non-regulated		
IATA (Cargo)		Non-regulated		

*PG : Packing group

15. Regulatory information

United States

- HCS Classification** : Irritating material
Sensitizing material
Carcinogen
Target organ effects
- U.S. Federal regulations** : **United States - TSCA 12(b) - Chemical export notification:** None required.
United States - TSCA 5(a)2 - Final significant new use rules: Not listed
United States - TSCA 5(a)2 - Proposed significant new use rules: Not listed
United States - TSCA 5(e) - Substances consent order: Not listed
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Immediate (acute) health hazard, Delayed (chronic) health hazard

SARA 313

		Product name	CAS number
Form R - Reporting requirements	:	Ammonium chloride ((NH ₄)Cl)	12125-02-9
	:	Sulfuric acid ammonium salt (1:2)	7783-20-2
Supplier notification	:	Ammonium chloride ((NH ₄)Cl)	12125-02-9
	:	Sulfuric acid ammonium salt (1:2)	7783-20-2

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

- United States inventory (TSCA 8b)** : All components are listed or exempted.
: All components are listed or exempted.

Canada

- WHMIS (Canada)** : Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Canadian lists

- Canadian NPRI** : The following components are listed: Ammonium chloride ((NH₄)Cl)
Sulfuric acid ammonium salt (1:2)

- CEPA Toxic substances** : None required.

- Canada inventory** : All components are listed or exempted.
: At least one component is not listed in DSL but all such components are listed in NDSL.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

- International lists** : **Australia inventory (AICS):** Not determined.

- China inventory (IECSC):** Not determined.
- Japan inventory:** Not determined.
- Korea inventory:** Not determined.
- New Zealand Inventory (NZIoC):** Not determined.
- Philippines inventory (PICCS):** Not determined.
- United States inventory (TSCA 8b):** All components are listed or exempted.
- Australia inventory (AICS):** Not determined.
- Japan inventory:** Not determined.
- China inventory (IECSC):** All components are listed or exempted.
- Korea inventory:** Not determined.
- New Zealand Inventory (NZIoC):** Not determined.
- Philippines inventory (PICCS):** Not determined.
- United States inventory (TSCA 8b):** All components are listed or exempted.

16. Other information

Label requirements : COMBUSTIBLE DUST WHEN FINELY DIVIDED AND SUSPENDED IN AIR. FINE DUST CLOUDS MAY FORM EXPLOSIVE MIXTURES. PRODUCT CAN EXPLODE IF DUST CLOUD IS FORMED AND IGNITED. MINIMIZE AIRBORNE DUST. PREVENT DUST ACCUMULATION. ELIMINATE ALL FIRE/IGNITION SOURCES INCLUDING STATIC DISCHARGES NEAR PRODUCT/PACKAGE. REFER TO HANDLING SECTION 7 OF THE MSDS FOR MORE INFORMATION. CAUSES RESPIRATORY TRACT AND EYE IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. POSSIBLE CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER, BASED ON ANIMAL DATA.

Hazardous Material Information System III (U.S.A.) :

Health	*	2
Flammability		1
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868. The customer is responsible for determining the PPE code for this material.

- Other special considerations** : Part of the CASCO® Brand of Adhesives and Resins from Momentive Specialty Chemicals
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