



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	RESTORE PLUS - ACID COOLING SYSTEM CLEANER
Other means of identification	
MSDS number	LT16551
Product code	CC2637 (55 gallon / 208 L Drum); CC2638 (1 gallon / 3.785 L)
Product use	Radiator cleaner for removing heavy rust and scale, oil contaminants and fuel contaminants.
Chemical family	Mixture of: Water; Surfactants; Acids; Sequesterant
Manufacturer	
Company name	Cummins Filtration
Address	1200 Fleetguard Road Cookeville, TN, U.S.A. 38506
Telephone	(931) 526 9551
Website	www.cumminsfiltration.com
E-Mail	fleetmaster.us@cummins.com
Supplier information	Refer to Manufacturer
Emergency phone number	Chemtrec 1-800-424-9300 (Within Continental U.S.); Chemtrec 703-527-3887 (Outside U.S.).

2. Hazard(s) Identification

Emergency overview	Clear amber liquid. Little or no odour. WARNING! May be harmful if inhaled or swallowed. May cause respiratory irritation. May cause severe irritation to the mouth, throat and stomach. Possible severe eye irritation and tissue damage. May cause skin irritation.
Potential health effects	
Routes of exposure	
Routes of entry skin & eye	YES
Routes of entry skin absorption	NO
Routes of entry inhalation	YES
Routes of entry ingestion	YES
Target organs	Eyes, skin, respiratory system, digestive system.
Chronic effects	Chronic skin contact with low concentrations may cause dermatitis.
Most important symptoms/effects, acute and delayed	Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include severe pain, tearing, redness, swelling and blurred vision. May cause irreversible eye damage. Severe respiratory irritant. Symptoms may include coughing, choking and wheezing. May cause severe irritation and corrosive damage in the mouth, throat and stomach. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding.
Potential environmental effects	Harmful to aquatic life with long lasting effects. Avoid release to the environment. See ECOLOGICAL INFORMATION, Section 12.

3. Composition/information on ingredients

Mixture

Chemical name	CAS #	Percent
Citric acid	77-92-9	10.0 - 25.0
Nonylphenol, ethoxylated	9016-45-9	5.0 - 10.0
Alcohols, C6-10, ethoxylated propoxylated	68987-81-5	1.0 - 5.0
Alcohols, C8-10, ethoxylated propoxylated	68603-25-8	1.0 - 5.0
Trisodium Hydroxyethylenediaminetriacetate	139-89-9	1.0 - 3.0
Phosphoric acid	7664-38-2	0.1 - 0.6

4. First Aid Measures

First aid procedures

Inhalation	IF INHALED: Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing stopped, begin artificial respiration. Get medical attention.
Skin contact	Immediately flush skin with running water for at least 15 minutes, while removing contaminated clothing. Get medical attention. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with running water for at least 20 minutes. Seek immediate medical attention/advice.
Ingestion	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to a person who is unconscious or is having convulsions Get medical attention immediately.

Notes to physician

Immediate medical attention is required. Causes serious eye damage. Provide general supportive measures and treat symptomatically.

General Information

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties

Not flammable by WHMIS criteria.

Extinguishing media

Suitable extinguishing media Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.

Unsuitable extinguishing media

None known.

Protection of firefighters
Specific hazards arising from the chemical

Contact with metals may release small amounts of flammable hydrogen gas. Vapours are heavier than air and collect in confined and low-lying areas. The pressure in sealed containers can increase under the influence of heat.

Protective equipment for firefighters

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

Fire fighting equipment/instructions

Move containers from fire area if safe to do so. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

Explosion data
Sensitivity to static discharge

Not expected to be sensitive to static discharge.



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Sensitivity to mechanical impact	Not expected to be sensitive to mechanical impact.
Hazardous combustion products	Carbon oxides; formaldehyde; Sulphur oxides; Nitrogen oxides (NOx); Other unidentified organic compounds
General fire hazards	Not classified as flammable.

6. Accidental Release Measures

Personal precautions	Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Wear appropriate protective equipment. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	Prevent product from entering drains, sewers, waterways and soil.
Methods and materials for containment and cleaning up	Ventilate the area. Remove all sources of ignition. Prevent further leakage or spillage if safe to do so. For spilled liquids: absorb spill with inert, non-combustible material such as sand, then place into suitable containers. Pick up and transfer to properly labelled containers. Contaminated absorbent material may pose the same hazards as the spilled product. Contact the proper local authorities.
Other information	Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling	Use only outdoors or in a well-ventilated area. Wear suitable protective equipment during handling. Avoid breathing mist or vapours. Avoid contact with skin, eyes and clothing. Keep away from extreme heat and direct flame. Keep away from incompatibles. Keep containers tightly closed when not in use. Wash thoroughly after handling. Empty containers retain residue (liquid and/or vapour) and can be dangerous.
Storage	Store in cool/well-ventilated place. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Inspect periodically for damage or leaks. Do not store near any incompatible materials (see Section 10).

8. Exposure Controls / Personal Protection

Occupational exposure limits

U.S. OSHA Exposure Limits (29 CFR 1910)

	Type	Value
Phosphoric acid (CAS 7664-38-2)	TWA	1 mg/m ³

US. ACGIH Threshold Limit Values

	Type	Value
Phosphoric acid (CAS 7664-38-2)	STEL	3 mg/m ³
	TWA	1 mg/m ³

Biological limit values

No biological exposure limits noted for the ingredient(s).

Engineering controls	Use only outdoors or in a well-ventilated area. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.
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Personal protective equipment

Eye / face protection Wear eye/face protection. Chemical splash goggles are recommended. A full face shield may also be necessary.

Skin protection Wear protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear sufficient clothing to prevent skin contact.

Respiratory protection If airborne concentrations are above the permissible exposure limit or are not known, use NIOSH-approved respirators. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

Hand protection Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

9. Physical and chemical properties

Appearance

Physical state Liquid.
Form Thin liquid.
Colour amber

Odour Little or no odour.

Odour threshold N/Av

pH 2.5 - 3.0

Melting point /freezing point N/Av

Initial boiling point and boiling range

104°C (220°F)

Flash point N/Av

N/Av

Evaporation rate N/Av

Flammability (solid, gas) Not applicable.

Lower flammability/explosive limit N/Av

Upper flammability/explosive limit N/Av

Vapour pressure N/Av

Vapour density > 1 (Air = 1)

Relative density 1.11 - 1.13

Solubility(ies)

Other solubility(ies) N/Av

Solubility (water) Complete

Partition coefficient (n-octanol/water) N/Av

Auto-ignition temperature N/Av

Decomposition temperature N/Av

Viscosity N/Av

Other information

Explosive properties Not explosive

Oxidizing properties None known.

Specific gravity 1.11 - 1.13

VOC N/Av

Volatilities % N/Av

Other physical/chemical data No additional information.

10. Stability and reactivity

Reactivity Not normally reactive. Contact with metals may release small amounts of flammable hydrogen gas.

Chemical stability Stable under the recommended storage and handling conditions prescribed.

Possibility of hazardous reactions No dangerous reaction known under conditions of normal use. Hazardous polymerization does not occur.



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Conditions to avoid	Direct sources of heat. Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.
Incompatible materials	Strong bases, strong oxidizing agents (e.g. Chlorides, peroxides), reducing agents (e.g. cyanides, metal hydrides).
Hazardous decomposition products	None known, refer to hazardous combustion products in Section 5.

11. Toxicological information

Toxicological data

Components	Species	Test Results
Citric acid		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg (No mortality)
<i>Inhalation</i>		
LC50	Rat	N/Av
<i>Oral</i>		
LD50	Rat	3000 mg/kg
Nonylphenol, ethoxylated		
Acute		
<i>Dermal</i>		
LD50	Rabbit	2080 - 2120 mg/kg
<i>Inhalation</i>		
LC50	Rat	N/Av
<i>Oral</i>		
LD50	Rat	1310 mg/kg
Alcohols, C6-10, ethoxylated propoxylated		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg (No mortality)
<i>Inhalation</i>		
LC50	Rat	> 50 mg/L (aerosol)
<i>Oral</i>		
LD50	Rat	2380 - 2745 mg/kg
Alcohols, C8-10, ethoxylated propoxylated		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 2000 mg/kg (No mortality)
<i>Inhalation</i>		
LC50	Rat	N/Av
<i>Oral</i>		
LD50	Rat	> 2000 mg/kg
Trisodium Hydroxyethylenediaminetriacetate		
Acute		
<i>Dermal</i>		
LD50	Rabbit	N/Av
<i>Inhalation</i>		
LC50	Rat	> 10 mg/L (aerosol)
<i>Oral</i>		
LD50	Rat	3200 mg/kg

Phosphoric acid		
Acute		
<i>Dermal</i>		
LD50	Rabbit	> 1260 mg/kg (85%); > 3160 mg/kg (75%)
<i>Inhalation</i>		
LC50	Rat	N/Av
<i>Oral</i>		
LD50	Rat	3500 mg/kg (85%); 4400 mg/kg (75%)

Acute effects Causes skin irritation. Causes serious eye damage. Severe respiratory irritant. May cause severe irritation and corrosive damage in the mouth, throat and stomach. See data above for individual ingredient acute toxicity data.

Senitization Not expected to be a skin or respiratory sensitizer.

Chronic effects Chronic skin contact with low concentrations may cause dermatitis.

Carcinogenicity Not known to be carcinogenic. No components are listed as carcinogens by ACGIH, IARC, OSHA or NTP.

Skin corrosion/irritation May cause moderate skin irritation.

Serious eye damage/irritation Causes eye damage.

Mutagenicity Contains no ingredient above reportable levels that is known to cause mutations in reproductive (germ) and/or non-reproductive cells (somatic).

Reproductive effects Not expected to cause reproductive effects.

Teratogenicity Not expected to be a teratogen.

Most important symptoms/effects, acute and delayed Causes skin irritation. Contact may cause redness, swelling and a painful sensation. Direct eye contact may produce severe irritation with possible eye damage. Symptoms may include severe pain, tearing, redness, swelling and blurred vision. May cause irreversible eye damage. Severe respiratory irritant. Symptoms may include coughing, choking and wheezing. May cause severe irritation and corrosive damage in the mouth, throat and stomach. Symptoms may include abdominal pain, vomiting, burns, perforations and bleeding.

Further information None known or reported by the manufacturer.

12. Ecological information

Ecotoxicity data:				
Components	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Citric acid	77-92-9	1516 mg/L (Bluegill sunfish)	N/Av	None.
Nonylphenol, ethoxylated	9016-45-9	1.3 mg/L (Bluegill sunfish)	N/Av	None.
Alcohols, C6-10, ethoxylated propoxylated	68987-81-5	4.2 - 11 mg/L (Rainbow trout) (Read-across)	N/Av	None.
Alcohols, C8-10, ethoxylated propoxylated	68603-25-8	4.2 - 11 mg/L (Rainbow trout) (Read-across)	N/Av	None.
Trisodium Hydroxyethylenediaminetriacetate	139-89-9	331 mg/L (Bluegill sunfish)	> 25.7 mg/L/35 days (Zebra fish)	None.
Phosphoric acid	7664-38-2	75.1 mg/L (Japanese ricefish)	N/Av	None.

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Components	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Citric acid	77-92-9	1535 mg/L/24hr (Daphnia magna)	N/Av	None.
Nonylphenol, ethoxylated	9016-45-9	4.8 mg/L (Daphnia magna)	N/Av	None.
Alcohols, C6-10, ethoxylated propoxylated	68987-81-5	2.4 - 13.5 mg/L (Daphnia magna) (Read-across)	N/Av	None.
Alcohols, C8-10, ethoxylated propoxylated	68603-25-8	2.4 - 13.5 mg/L (Daphnia magna) (Read-across)	N/Av	None.
Trisodium Hydroxyethylenediaminetriacetate	139-89-9	192 mg/L (Daphnia magna)	25 mg/L	None.
Phosphoric acid	7664-38-2	376 mg/L (Daphnia magna)	N/Av	None.

Components	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Citric acid	77-92-9	> 18 000 mg/L (Green algae) (Read-across)	N/Av	None.
Nonylphenol, ethoxylated	9016-45-9	N/Av	N/Av	None.
Alcohols, C6-10, ethoxylated propoxylated	68987-81-5	14 - 45 mg/L/72hr (Green algae) (Read-across)	10 mg/L/72hr	None.
Alcohols, C8-10, ethoxylated propoxylated	68603-25-8	14 - 45 mg/L/72hr (Green algae) (Read-across)	10 mg/L/72hr (Read-across)	None.
Trisodium Hydroxyethylenediaminetriacetate	139-89-9	12.06 mg/L/72hr (Green algae)	N/Av	None.
Phosphoric acid	7664-38-2	32 mg/L/72hr (Green algae)	N/Av	None.

Ecotoxicity

Harmful to aquatic life with long lasting effects. The product contains the following substances which are hazardous for the environment: Nonylphenol, ethoxylated; Alcohols, C6-10, ethoxylated propoxylated; Alcohols, C8-10, ethoxylated propoxylated. See above for individual ingredient ecotoxicity data.

Environmental effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters.

Aquatic toxicity

None expected.

Persistence and degradability

No data is available on the product itself. Contains the following chemicals which are not readily biodegradable: Trisodium Hydroxyethylenediaminetriacetate; Phosphoric acid. The following ingredients are considered to be readily biodegradable: Citric acid; Alcohols, C6-10, ethoxylated propoxylated; Alcohols, C8-10, ethoxylated propoxylated.

Bioaccumulation / accumulation

No data is available on the product itself. See the following data for ingredient information.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Citric acid (CAS 77-92-9)	- 1.72	3
Nonylphenol, ethoxylated (CAS 9016-45-9)	3.7	< 0.2 to < 1.4
Alcohols, C6-10, ethoxylated propoxylated (CAS 68987-81-5)	3.01	N/Av
Alcohols, C8-10, ethoxylated propoxylated (CAS 68603-25-8)	3.15 - 4.57	N/Av
Trisodium Hydroxyethylenediaminetriacetate (CAS 139-89-9)	- 11.36 (calculated)	N/Av
Phosphoric acid (CAS 7664-38-2)	- 0.77	N/Av

Mobility in soil The product itself has not been tested.

13. Disposal consideration

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of in accordance with local regulations.

Waste from residues / unused products Dispose in accordance with all applicable federal, provincial, state and local regulations.

Contaminated packaging Empty containers should be taken for local recycling or waste disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

TDG

Not regulated as dangerous goods

ICAO/IATA

Not regulated as dangerous goods

IMDG

Not regulated as dangerous goods

General information Appropriate advice on safety must accompany the package. This product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code. See Section 12 for more environmental information.

15. Regulatory information

Canadian regulations This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

WHMIS status Controlled

WHMIS classification Class D2B (Materials Causing Other Toxic Effects, Toxic Material)

WHMIS labeling





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International Inventories

TSCA: All listed ingredients appear on the Toxic Substances Control Act (TSCA) inventory.

Components listed below are present on the following International Inventory lists:

<u>Ingredients</u>	<u>CAS #</u>	<u>European EINECS</u>	<u>Australia AICS</u>	<u>Philippines PICCS</u>	<u>Japan ENCS</u>	<u>Korea KECI/KECL</u>	<u>China IECSC</u>	<u>NewZealand IOC</u>
Citric acid	77-92-9	201-069-1	Present	Present	(2)-1318	KE-20831	Present	HSR003138
Nonylphenol, ethoxylated	9016-45-9	500-024-6	Present	Present	(7)-172	KE-26244	Present	HSR003054; HSNO Approval: HSR006598, HSR006618 (dilution)
Alcohols, C6-10, ethoxylated propoxylated	68987-81-5	Polymer	Present		(7)-97	KE-13420	Present	May be used as a component in a product covered by a group standard, but is not approved for use as a chemical in its own right.
Alcohols, C8-10, ethoxylated propoxylated	68603-25-8	Polymer	Present	Present	(7)-97	KE-13422	Present	HSR003962
Trisodium Hydroxyethylenediaminetri acetate	139-89-9	205-381-9	Present	Present	(2)-1268	KE-02967	Present	HSR004041
Phosphoric acid	7664-38-2	231-633-2	Present	Present	(1)-422	KE-27427	Present	HSR001545, HSR001571 (dilution)

16. Other information, including date of preparation or last revision

NFPA Rating	0 - Minimal 1 - Slight 2 - Moderate 3 - Serious
	: <i>Health:</i> 2 <i>Flammability:</i> 0 <i>Instability:</i> 1 <i>Special Hazards:</i> None.
HMIS Rating	: * - Chronic hazard 0 - Minimal 1 - Slight 2 - Moderate 3 - Serious
	<i>Health:</i> *2 <i>Flammability:</i> 0 <i>Reactivity:</i> 1
Issue date	05/27/2015
Version #	1
Legend	ACGIH: American Conference of Governmental Industrial Hygienists AICS: Australian Inventory of Chemical Substances CAS: Chemical Abstract Services CSA: Canadian Standards Association EC50: Effective Concentration 50%. EINECS: European Inventory of Existing Commercial chemical Substances ENCS: Existing and New Chemical Substances HSDB: Hazardous Substances Data Bank IARC: International Agency for Research on Cancer IBC: Intermediate Bulk Container IECSC: Inventory of Existing Chemical Substances IMDG: International Maritime Dangerous Goods IOC: Inventory of Chemicals KECI: Korean Existing Chemicals Inventory KECL: Korean Existing Chemicals List LC: Lethal Concentration LD: Lethal Dose N/Ap: Not Applicable N/Av: Not Available NIOSH: National Institute of Occupational Safety and Health NOEC: No observable effect concentration NTP: National Toxicology Program

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OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PEL: Permissible exposure limit
PICCS: Philippine Inventory of Chemicals and Chemical Substances
RTECS: Registry of Toxic Effects of Chemical Substances
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TLV: Threshold Limit Values
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

Bibliography

1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2015.
2. International Agency for Research on Cancer Monographs, searched 2015.
3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2015 (Chempendium, HSDB and RTECs).
4. Material Safety Data Sheets from manufacturer.
5. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2015.

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