Safety Data Sheet

HiTEC® 4733 Fuel Additive

SDS no. H4733

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Section 1. Identification

GHS product identifier : HiTEC® 4733 Fuel Additive

Product use : Petrochemical industry: Fuel additive.

In case of emergency - Chemical

0800-70-77-022 (Brazil)
01-800-681-9531 (Mexico)
+1-703-527-3887 (International)
+1-703-741-5979 (Spanish language)
+1-800-424-9300 (US & Canada)

Manufacturer / Supplier

Afton Chemical Corporation
500 Spring St.
Richmond, VA 23219
USA

Afton Chemical Canada Corporation
5045 South Service Road
Suite 101
Burlington, ON L7L 5Y7
905-631-5470

Non-Emergency Telephone: +1-804-788-5800

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture :
SKIN CORROSION - Category 1B
SERIOUS EYE DAMAGE - Category 1
SKIN SENSITIZATION - Category 1
TOXIC TO REPRODUCTION (Unborn child) - Category 1B
TOXIC TO REPRODUCTION (Fertility) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements :
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May damage the unborn child. Suspected of damaging fertility.
Causes damage to organs through prolonged or repeated exposure. (liver)

Precautionary statements

Section 2. Hazards identification

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves, protective clothing and eye or face protection. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace.

Response : IF exposed or concerned: Get medical advice or attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. IF ON SKIN: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice or attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

Storage : Store locked up. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Additional hazards : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	CAS number	Conc. (% w/w)	US GHS Classification
2,6-di-tert-butylphenol 2,4,6-tri-tert-butylphenol	128-39-2 732-26-3	≥75 - ≤85 ≥10 - ≤12	SKIN IRRITATION - Category 2 ACUTE TOXICITY (oral) - Category 4 SKIN SENSITIZATION - Category 1B TOXIC TO REPRODUCTION (Unborn child) - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver) - Category 1
2-tert-butylphenol	88-18-6	≥5 - ≤10	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION - Category 1B SERIOUS EYE DAMAGE - Category 1
2,4-di-tert-butylphenol	96-76-4	≥3 - ≤5	COMBUSTIBLE DUSTS SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1
phenol	108-95-2	≥0.5 - <1	ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 3 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 GERM CELL MUTAGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

Section 3. Composition/information on ingredients

4-tert-butylphenol	98-54-4	≥0.5 - <1	SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 TOXIC TO REPRODUCTION (Fertility) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

Any concentration shown as a range is to protect confidentiality or is due to batch variation. If specific chemical identify is withheld, it is to protect confidentiality.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. 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. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. If inhaled, remove to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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. If not breathing, give artificial respiration. If breathing is difficult, administer oxygen.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. Continue to rinse for at least 15 minutes.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Section 4. First aid measures

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
stomach pains
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : 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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : In case of fire, use water spray (fog), foam, dry chemical or CO_2.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : 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.

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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : 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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

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

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.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. 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.

Advice on general occupational hygiene : 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : 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. 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. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
phenol	**ACGIH TLV (United States, 3/2019).** **Absorbed through skin.** TWA: 5 ppm 8 hours. TWA: 19 mg/m³ 8 hours. **OSHA PEL (United States, 5/2018).** **Absorbed through skin.** TWA: 5 ppm 8 hours. TWA: 19 mg/m³ 8 hours.

Appropriate engineering controls : 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.

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.

Individual protection measures

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.

Eye/face protection : 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : 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.

Body protection : 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.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : White to yellowish. [Light]

Odor : Phenolic.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : 224°C (435.2°F)

Flash point : Closed cup: 93.4°C (200.1°F) [Pensky-Martens. Minimum]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Density : 0.934 g/cm^3

Relative density : Not available.

Solubility : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Kinematic (40°C (104°F)): 0.063 cm^2/s (6.3 cSt)
Not available.

Explosive properties : Not available.

Oxidizing properties : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : High temperatures, sparks and open flames.

Incompatible materials : Strong oxidizing and reducing agents.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Section 11. Toxicological information

Product/ingredient name	Test	Result	Species	Dose	Exposure	Remarks
2,6-di-tert-butylphenol	None available.	LD50 Dermal	Rabbit	>10000 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	>5000 mg/kg	-	-
2,4,6-tri-tert-butylphenol	402 Acute Dermal Toxicity	LD50 Dermal	Rat	>2000 mg/kg	-	-
	-	LD50 Oral	Rat	1670 mg/kg	-	-
2-tert-butylphenol	403 Acute Inhalation Toxicity	LC50 Inhalation Dusts and mists	Rat	1070 mg/m³	4 hours	-
	402 Acute Dermal Toxicity	LD50 Dermal	Rat	705 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	789 mg/kg	-	-
2,4-di-tert-butylphenol	None available.	LD50 Dermal	Rabbit	>2000 mg/kg	-	Based on data for a similar substance.
	401 Acute Oral Toxicity	LD50 Oral	Rat	>2000 mg/kg	-	-
phenol	402 Acute Dermal Toxicity	LD50 Dermal	Rat	660 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	650 mg/kg	-	-
4-tert-butylphenol	403 Acute Inhalation Toxicity	LC50 Inhalation Vapor	Rat	>5.6 mg/l	4 hours	-
	402 Acute Dermal Toxicity	LD50 Dermal	Rabbit	16000 mg/kg	-	-
	401 Acute Oral Toxicity	LD50 Oral	Rat	>2000 mg/kg	-	-

Conclusion/Summary : Not available.

Irritation/Corrosion

Product/ingredient name	Test	Species	Result	Remarks
2,6-di-tert-butylphenol	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant	Not H315 at <35%. On basis of test data
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Not an Irritant	-
2,4,6-tri-tert-butylphenol	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Not an Irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Not an Irritant	-
2-tert-butylphenol	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Visible necrosis	-
	None available.	Rabbit	Eyes - Visible necrosis	-
2,4-di-tert-butylphenol	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Visible necrosis	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Irritant	-
phenol	None available.	Rabbit	Skin - Visible necrosis	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Visible necrosis	-
4-tert-butylphenol	404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Irritant	-
	405 Acute Eye Irritation/Corrosion	Rabbit	Eyes - Severe irritant	-

Conclusion/Summary

Skin : Causes severe skin burns.

Section 11. Toxicological information

Eyes : Causes serious eye damage.

Respiratory : Not available.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result	Remarks
2,6-di-tert-butylphenol	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-
2,4,6-tri-tert-butylphenol	429 Skin Sensitization: Local Lymph Node Assay	skin	Mouse	Sensitizing	-
2-tert-butylphenol	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-
2,4-di-tert-butylphenol	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-
phenol	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-
4-tert-butylphenol	406 Skin Sensitization	skin	Guinea pig	Not sensitizing	-

Conclusion/Summary

Skin : May cause an allergic skin reaction.

Respiratory : Not available.

Mutagenicity

Product/ingredient name	Test	Experiment	Result	Remarks
2,6-di-tert-butylphenol	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
2,4,6-tri-tert-butylphenol	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	476 *In vitro* Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
2-tert-butylphenol	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative	-
	473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Equivocal	WOE does not support classification
2,4-di-tert-butylphenol	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	476 *In vitro* Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-
	473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Equivocal	WOE does not support classification
phenol	473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Positive	WOE does not support classification
	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Negative	-
	476 *In vitro* Mammalian Cell Gene Mutation Test	Experiment: In vitro Subject: Mammalian-Animal	Equivocal	-
	487 *In vitro* Micronucleus	Experiment: In vitro	Equivocal	-

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	Test	Subject: Mammalian-Animal		
	474 Mammalian Erythrocyte Micronucleus Test	Experiment: In vivo Subject: Mammalian-Animal	Equivocal	-
4-tert-butylphenol	471 Bacterial Reverse Mutation Test	Experiment: In vitro Subject: Bacteria	Negative	-
	473 *In vitro* Mammalian Chromosomal Aberration Test	Experiment: In vitro Subject: Mammalian-Animal	Negative	-

Conclusion/Summary : Not available.

Carcinogenicity **Result**

Product/ingredient name	Test	Species	Exposure	Result	Remarks
2,4,6-tri-tert-butylphenol	None available.	Rat	24 months	Negative - Oral - NOAEL	-
phenol	451 Carcinogenicity Studies	Rat	103 weeks; 7 days per week	Negative - Oral - NOAEL	-

Conclusion/Summary : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
phenol	-	3	-

Reproductive toxicity

Product/ingredient name	Test	Route of exposure	Species	Maternal toxicity	Fertility	Development toxin	Remarks
2,6-di-tert-butylphenol	421 Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Equivocal	WOE does not support classification
2,4,6-tri-tert-butylphenol	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Positive	-
2-tert-butylphenol	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Negative	Based on data for a similar substance.
2,4-di-tert-butylphenol	None available.	Oral	Rat	Positive	Negative	Negative	-
	421 Reproduction/ Developmental Toxicity Screening Test	Oral	Rat	Positive	Negative	Equivocal	WOE does not support classification
phenol	416 Two-Generation Reproduction Toxicity Study	Oral	Rat	Negative	Negative	Negative	-
4-tert-butylphenol	416 Two-Generation Reproduction Toxicity Study	Oral	Rat	Positive	Positive	Positive	-
	422 Combined	Oral	Rat	Positive	Negative	Negative	-

Section 11. Toxicological information

	Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test						

Conclusion/Summary : May damage the unborn child. Suspected of damaging fertility.

Teratogenicity

Product/ingredient name	Test	Species	Result	Remarks
2-tert-butylphenol	414 Prenatal Developmental Toxicity Study	Rat	Equivocal - Oral	WOE does not support classification
2,4-di-tert-butylphenol	414 Prenatal Developmental Toxicity Study	Rabbit	Negative - Oral	-
phenol	414 Prenatal Developmental Toxicity Study	Rat	Positive - Oral	-
	414 Prenatal Developmental Toxicity Study	Rat	Positive - Oral	-
4-tert-butylphenol	414 Prenatal Developmental Toxicity Study	Rat	Negative - Oral	-

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
4-tert-butylphenol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
2,4,6-tri-tert-butylphenol	Category 1	-	liver
phenol	Category 2	-	-

Information on the likely routes of exposure : Skin, Eyes, Ingestion, and Inhalation

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Section 11. Toxicological information

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
stomach pains
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Species	Dose	Exposure	Result	Remarks
2,6-di-tert-butylphenol	408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Rat	270 mg/kg	-	Sub-chronic NOAEL Oral	-
	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	100 mg/kg	-	Sub-acute NOAEL Oral	-
2,4,6-tri-tert-butylphenol	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	3 mg/kg	-	Sub-acute NOAEL Oral	-
2-tert-butylphenol	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	100 mg/kg	-	Sub-acute NOAEL Oral	-
2,4-di-tert-butylphenol	407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Rat	100 mg/kg	-	Sub-acute NOAEL Oral	-
phenol	451 Carcinogenicity Studies	Rat	450 mg/kg	-	Chronic NOAEL Oral	-
	Not available.	Rabbit	130 mg/kg	-	Chronic NOAEL Dermal	-
	412 Repeated Dose Inhalation Toxicity: 28-day or 14-day Study	Rat	96 mg/m³	28 days	Sub-acute NOAEL Inhalation Vapor	-
4-tert-butylphenol	422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat	60 mg/kg	-	Sub-acute NOAEL Oral	-

Section 11. Toxicological information

Conclusion/Summary : Not available.

General : Causes damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : May damage the unborn child.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : Suspected of damaging fertility.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure	Remarks
2,6-di-tert-butylphenol	Acute EC50 1.2 mg/l	Algae - Pseudokirchneriella subcapitata	96 hours	-
	Acute EC50 0.45 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute EC50 >1000 mg/l	Micro-organism	3 hours	-
	Acute LC50 1.4 mg/l	Fish - Pimephales promelas	96 hours	-
	Chronic NOEC 0.64 mg/l	Algae - Pseudokirchneriella subcapitata	96 hours	-
	Chronic NOEC 0.035 mg/l	Daphnia - Daphnia magna	21 days	-
2,4,6-tri-tert-butylphenol	Acute EC50 >0.04 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute EC50 >0.072 mg/l	Daphnia - Daphnia magna	48 hours	No effects at saturation.
	Acute EL50 >1000 mg/l	Micro-organism	3 hours	-
	Acute LC50 0.0609 mg/l	Fish - Pimephales promelas	96 hours	-
	Chronic NOEC 0.04 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Chronic NOEC 0.36 mg/l	Daphnia - Daphnia magna	21 days	-
2-tert-butylphenol	Acute EC50 >10 mg/l	Micro-organism	3 hours	Based on data for a similar substance.
	Acute EL50 6.5 mg/l	Algae - Desmodesmus subspicatus	72 hours	-
	Acute EL50 3.4 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute LC50 2.682 mg/l	Fish	96 hours	QSAR resutlt
	Chronic EL10 2 mg/l	Algae - Desmodesmus subspicatus	72 hours	-
	Chronic NOEL 0.32 mg/l	Daphnia - Daphnia magna	21 days	Based on data for a similar substance.
2,4-di-tert-butylphenol	Acute EC50 0.37 mg/l	Algae - Desmodesmus subspicatus	72 hours	-
	Acute EC50 >10 mg/l	Micro-organism	3 hours	-
	Acute EL50 0.5 mg/l	Daphnia - Daphnia magna	48 hours	-
	Acute LC50 1.4 mg/l	Fish - Pimephales promelas	96 hours	Based on data for a similar substance.

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	Chronic EC10 0.15 mg/l	Algae - Desmodesmus subspicatus	72 hours	-
	Chronic NOEC 0.1 mg/l	Daphnia - Daphnia magna	21 days	-
phenol	Acute EC50 3.1 mg/l	Daphnia - Ceriodaphnia dubia	48 hours	-
	Acute EL50 61.1 mg/l	Algae - Pseudokirchneriella subcapitata	96 hours	-
	Acute IC50 766 mg/l	Micro-organism	3 hours	-
	Acute LC50 8.9 mg/l	Fish - Oncorhynchus mykiss	96 hours	-
	Chronic NOEC 1.5 mg/l Fresh water	Daphnia - Daphnia magna	21 days	-
	Chronic NOEC 0.63 mg/l Fresh water	Fish - Notopterus notopterus	30 days	-
	Chronic NOEL 0.16 mg/l	Daphnia - Daphnia magna	16 days	-
	Chronic NOEL 0.077 mg/l	Fish - Cirrhina mrigala	60 days	-
4-tert-butylphenol	Acute EC50 3900 µg/l Fresh water	Daphnia - Daphnia magna	48 hours	-
	Acute EC50 >10 mg/l	Micro-organism	3 hours	-
	Acute EL50 14 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Acute LC50 5140 µg/l Fresh water	Fish - Pimephales promelas	96 hours	-
	Chronic EL10 2.9 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Chronic NOEL 0.32 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours	-
	Chronic NOEL 0.73 mg/l	Daphnia - Daphnia magna	21 days	-
	Chronic NOEL 0.1 mg/l	Fish - Pimephales promelas	128 days	-

Conclusion/Summary : Very toxic to aquatic life with long lasting effects.

Persistence and degradability

Product/ingredient name	Test	Result	Remarks
2,6-di-tert-butylphenol	OECD ECHA 302C Inherent Biodegradability: Modified MITI Test (II)	12 to 24 % - Not readily - 28 days	-
2,4,6-tri-tert-butylphenol	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	13 % - Not readily - 28 days	-
2-tert-butylphenol	OECD 302B Inherent Biodegradability: Zahn-Wellens/ EMPA Test	96 % - Inherent - 28 days	-
2,4-di-tert-butylphenol	OECD 302C Inherent Biodegradability: Modified MITI Test (II)	0 % - Not readily - 28 days	-
phenol	OECD 301C Ready Biodegradability - Modified MITI Test (I)	62 % - Readily - 4.17 days	-

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4-tert-butylphenol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	60 % - Readily - 28 days	-

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
2,6-di-tert-butylphenol	4.5	-	high
2,4,6-tri-tert-butylphenol	7.1	13803.84	high
2-tert-butylphenol	3.31	78	low
2,4-di-tert-butylphenol	4.8	251.19	low
phenol	1.47	647	high
4-tert-butylphenol	3	44 to 48	low

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	UN3145	UN3145	UN3145	UN3145
UN proper shipping name	Alkylphenols, liquid, n. o.s.	Alkylphenols, liquid, n. o.s.	Alkylphenols, liquid, n. o.s. Marine pollutant	Alkylphenols, liquid, n. o.s.
Transport hazard class(es)	8 	8 	8 	8 
Packing group	II	II	II	II
Environmental hazards	Yes.	Yes.	Yes.	Yes.

Notice to reader

The above transport information is provided to assist in the proper classification of this product and may not be suitable for all shipping conditions.

Additional information

DOT : Marine pollutant: 2,6-di-tert-butylphenol

IMDG : Marine pollutant

Section 14. Transport information

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations :

United States - TSCA 12(b) - Chemical export notification

List name	Status	Name on list	Ref. number
United States - TSCA 12(b) - Chemical export notification	Annual notification	2,4,6-tri-tert-butylphenol	

CERCLA Reportable quantity : CERCLA: Hazardous substances.: phenol: 1000 lbs. (454 kg);

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
phenol	≥0.5 - <1	Yes.	500 / 10000	-	1000	-

SARA 311/312

Classification : SKIN CORROSION - Category 1B
SERIOUS EYE DAMAGE - Category 1
SKIN SENSITIZATION - Category 1
TOXIC TO REPRODUCTION (Unborn child) - Category 1B
TOXIC TO REPRODUCTION (Fertility) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver) - Category 1

Composition/information on ingredients

Name	%	Classification
2,6-di-tert-butylphenol	≥75 - ≤85	SKIN IRRITATION - Category 2
2,4,6-tri-tert-butylphenol	≥10 - ≤12	ACUTE TOXICITY (oral) - Category 4 SKIN SENSITIZATION - Category 1B TOXIC TO REPRODUCTION (Unborn child) - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver) - Category 1
2-tert-butylphenol	≥5 - ≤10	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION - Category 1B SERIOUS EYE DAMAGE - Category 1
2,4-di-tert-butylphenol	≥3 - ≤5	COMBUSTIBLE DUSTS SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1
phenol	≥0.5 - <1	ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 3 ACUTE TOXICITY (inhalation) - Category 3 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 GERM CELL MUTAGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
4-tert-butylphenol	≥0.5 - <1	SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 TOXIC TO REPRODUCTION (Fertility) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE)

Section 15. Regulatory information

		(Respiratory tract irritation) - Category 3

SARA 313

No SARA 313 chemicals are present above the reporting threshold.

State - California Prop. 65

Not listed.

Canadian regulations **%**

Canada Significant New Activity Notice	:	Phenol, 2,4,6-tris(1,1-dimethylethyl)-	Canada - Canadian significant new activity notice substances

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : The following components are listed: phenol, 2,4,6-tris(1,1-dimethylethyl)-; 2,4,6-tri-tert-butylphenol

International Inventory Status

Australia	:	All components are listed or exempted.
Canada	:	All components are listed or exempted.
China	:	All components are listed or exempted.
Japan	:	All components are listed or exempted. Banned/Restricted list: Japan - Chemical Substances Control Law (CSCL)
Republic of Korea	:	All components are listed or exempted.
New Zealand	:	All components are listed or exempted.
Philippines	:	All components are listed or exempted.
Taiwan	:	All components are listed or exempted.
United States Active	:	All components are active or exempted.
Europe	:	For information on compliance with regulation (EC) No. 1907/2006 (REACH) and amendments please contact your Afton representative.

Section 16. Other information

History

Date of issue/Date of revision : 10/27/2020

Prepared by : EHS Department (Tel: +1 804 788 5800)

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations
WOE = Weight of Evidence

Indicates information that has changed from previously issued version.

Notice to reader

This information and these recommendations are offered in good faith and believed to be correct as of the date hereof. Information and recommendations are supplied upon the condition that the recipients will make their own decision as to safety and suitability for their purposes. No representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or of any other nature, are made with respect to the product or the information and recommendations. Afton makes no representation as to completeness or accuracy. In no event will Afton be responsible for damages of any nature whatsoever resulting from the use or reliance upon the information and recommendations.