Safety Data Sheet

HiTEC 4898AS Fuel Additive

MSDS no. H4898AS

HiTEC is a trademark owned by Afton Chemical Corporation or one of its subsidiaries.

1. Product and company identification

Product use Petrochemical industry: Fuel additive.

Date of issue/Revisions **15 November 2011**

In case of emergency - Chemical

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2. HAZARDS IDENTIFICATION

Notice to reader

Afton operates a world-wide system for hazard communication. Some hazards shown in Section 2 may apply to non-EU countries and may not result in classification and labeling in the EU. Please see Sections 3 and 15 for country specific classification information, and Section 11 for additional details.

Europe: The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Australia: HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

Primary hazards and critical effects : WARNING!
CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
ASPIRATION HAZARD IF SWALLOWED.

Physical/chemical hazards : COMBUSTIBLE. - United States and Canada
FLAMMABLE. - European Union
VAPOR MAY CAUSE FLASH FIRE.

Environmental hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

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

Health	1
Fire hazard	2
Reactivity	0

3. Composition/information on ingredients

Note: see section 8 for occupational exposure limits and section 11 for LC50/LD50 information.

Substance/Preparation : Preparation

Ingredient name	CAS no.	Conc. (% w/w)	EU Classification	WHMIS Regulated?
Long chain alkenyl heterocycle	Proprietary	30 - 60	Not classified.	Yes.
Solvent naphtha (petroleum), light aromatic	64742-95-6	30 - 60	R10 Xn; R65 Xi; R37 R66, R67 N; R51/53	No.**
Benzene, 1,2,4-trimethyl-	95-63-6	10 - 19.9	R10 Xn; R20 Xi; R36/37/38 N; R51/53	No.**
Benzene, 1,3,5-trimethyl-	108-67-8	5 - 9.9	R10 Xi; R37 N; R51/53	No.**
N-Propylbenzene	103-65-1	5 - 9.9	R10 Xn; R65 Xi; R37 N; R51/53	No.**
Xylene	1330-20-7	1 - 4.9	R10 Xn; R20/21 Xi; R38	No.**
Cumene	98-82-8	1 - 4.9	R10 Xn; R65 Xi; R37 N; R51/53	No.**
Benzene, 1,2,3-trimethyl-	526-73-8	1 - 4.9	R10	No.**
Kerosene	8008-20-6	1 - 4.9	Xn; R65	Yes.
Solvent naphtha (petroleum), heavy aromatic	64742-94-5	0.1 - 0.5	Xn; R65 R66, R67 N; R51/53	Yes.

Notice to reader

See Section 15 for information concerning WHMIS regulated ingredients marked as proprietary.
***These ingredients are components of a complex mixture and not additional ingredients in the controlled product.*

4. First aid measures

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : Do NOT induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. If affected person is fully conscious, give one glass of water to drink. Never give anything by mouth to an unconscious person. If breathing has stopped, trained personnel should begin artificial respiration immediately. Get immediate medical attention.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If breathing has stopped, trained personnel should begin artificial respiration immediately. Get medical attention immediately.

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.

5. Fire-fighting measures

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

Fire-fighting procedures : Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Fire/explosion hazards : COMBUSTIBLE. - United States and Canada FLAMMABLE. - European Union
VAPOR MAY CAUSE FLASH FIRE. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

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

Flash point : Closed cup: 46°C (114.8°F) [Pensky-Martens. Minimum]

6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Follow all fire-fighting procedures (section 5). Do not touch or walk through spilled material.

Environmental precautions and clean-up methods : If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Avoid contact of spilled material with soil and prevent runoff entering surface waterways.

Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling : Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.

Storage : Keep container in a well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure controls/personal protection

Engineering controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value.

Personal protective equipment

Respiratory system : Use appropriate respiratory protection if there is the potential to exceed the exposure limit(s).

Skin and body : Where contact is likely, wear chemical resistant gloves, a chemical resistant suit, and boots. Additional body garments should be used based upon the task being performed.

Hands : Hand Protection: Wear chemical resistant gloves. Nitrile gloves of minimum thickness 0.4 mm have an expected breakthrough time of 30 minutes or less when in frequent contact with the product. Due to variable exposure conditions the user must consider that the practical use of a chemical-protective glove in practice may be much shorter than the permeation time above. Manufacturer's directions for use, especially about the minimum thickness and the minimum breakthrough time, must be observed. This information does not replace suitability tests by the end user since glove protection varies depending on the conditions under which the product is used.

Eyes : Safety goggles are considered minimum protection. Goggles with a face shield may be necessary depending on quantity of material and conditions of use.

Occupational exposure limits

Ingredient name	OEL United States	OEL Canada	OEL Europe	OEL Australia
1) Benzene, 1,2,4-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	(Canada). TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
2) Benzene, 1,3,5-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	(Canada). TWA: 25 ppm	**EH40 (UK) (Europe).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
3) Xylene	**ACGIH (United States, 1996).** TWA: 100 ppm STEL: 150 ppm **OSHA (United States).** TWA: 100 ppm	(Canada). TWA: 100 STEL: 150	**EH40 (UK) (Europe, 2002). Absorbed through skin.** TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s).	**NOHSC (Australia, 2003).** STEL: 80 ppm 15 minute(s).
4) Cumene	**ACGIH (United States, 1994). Absorbed through skin.** TWA: 50 ppm **OSHA (United States, 1989). Absorbed through skin.** TWA: 50 ppm	(Canada). Absorbed through skin. TWA: 50 ppm	**EH40 (UK) (Europe). Absorbed through skin.** TWA: 25 ppm 8 hour(s). **EH40 (UK) (Europe, 2002). Absorbed through skin.** TWA: 125 mg/m³ 8 hour(s). STEL: 250 mg/m³ 15 minute(s).	**NOHSC (Australia, 2003). Absorbed through skin.** TWA: 25 ppm 8 hour(s). STEL: 75 ppm 15 minute(s).
5) Benzene, 1,2,3-trimethyl-	**ACGIH (United States, 1999).** TWA: 25 ppm	(Canada). TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm	**ACGIH (United States, 1999).** TWA: 25 ppm
6) Kerosene	**ACGIH TLV (United States). Absorbed**	(Canada). Notes: Canadian exposure	**ACGIH TLV (United States). Absorbed**	**ACGIH TLV (United States). Absorbed**

through skin.	limit applies to straight run Kerosene in Ontario	through skin.	through skin.
TWA: 200 mg/m³ 8 hour(s).	TWA: 35 ppm 8 hour(s).	TWA: 200 mg/m³ 8 hour(s).	TWA: 200 mg/m³ 8 hour(s).

9. Physical and chemical properties

Physical state and Appearance : Liquid.

Color : Brown. [Dark]

Odor : Aromatic. [Slight]

Density : Not determined.

Specific gravity : 0.9233 @ 15.6°C

Solubility : Insoluble in the following materials: cold water.

Viscosity : 9.9 cSt at 40°C

Auto-ignition temperature : Not determined.

Flash point : Closed cup: 46°C (114.8°F) [Pensky-Martens. Minimum]

10. Stability and reactivity

Stability : The product is stable.

Materials to avoid : Strong oxidizing and reducing agents.

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

11. Toxicological information

Routes of entry : Skin, Eyes, Ingestion, and Inhalation.

Target organs : Contains material which may cause damage to the following organs: blood, kidneys, lungs, liver, gastrointestinal tract, upper respiratory tract, skin, eyes, bone marrow, central nervous system (CNS).

Acute effects

Inhalation : Irritating to respiratory system.

Ingestion : Aspiration hazard if swallowed. Can enter lungs and cause damage. Does not meet EU R65 classification criteria.

Ingestion may cause gastrointestinal irritation and diarrhea.

Skin contact : Irritating to skin.

Does not meet EU R38 classification criteria.

Eye contact : Irritating to eyes.

Does not meet EU R41 or R36 classification criteria.

Adverse effects : - Adverse symptoms may include the following:: In the presence of slight maternal toxicity, fetotoxic effects have been observed in the offspring of rats exposed by inhalation to Solvent Naphtha (petroleum) light aromatic.
- Adverse symptoms may include the following:: This product contains trimethylbenzene. Literature data indicate that long-term inhalation exposure causes blood effects in laboratory animals.
- Adverse symptoms may include the following:: Central nervous system, liver, kidneys, and blood effects by inhalation and heart beat irregularity (arrythmia) and heart beat - increase. High exposures to xylene in some animal studies, often at levels toxic to the mother, affected embryo/fetal development. The significance of this finding to humans is not known. Xylene vapour has caused occupational skin sensitization in humans.
- Adverse symptoms may include the following:: Bone marrow depression, kidneys, liver, and spleen injury

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA	EU
Xylene	A4	-	-	-	-	-	-
Kerosene	A3	3	-	-	-	-	-

Toxicity data

Product/ingredient name	Result	Species	Dose	Exposure

Solvent naphtha (petroleum), light aromatic	LD50 Oral	Rat	8400 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LD50 Oral	Rat	2900 mg/kg	-
Benzene, 1,2,4-trimethyl-	LD50 Dermal	Rabbit	3160 mg/kg	-
	LD50 Oral	Rat	3400 to 6000 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LC50 Inhalation Vapor	Rat	18000 mg/m³	4 hours
Benzene, 1,3,5-trimethyl-	LC50 Inhalation Vapor	Rat	24000 mg/m³	4 hours
N-Propylbenzene	LD50 Oral	Rat	6040 mg/kg	-
Xylene	LD50 Dermal	Rabbit	>14100 mg/kg	-
	LD50 Oral	Rat	4300 mg/kg	-
	LC50 Inhalation Vapor	Rat	5000 to 8500 ppm	4 hours
Cumene	LD50 Dermal	Rabbit	10578 mg/kg	-
	LD50 Oral	Mouse	12750 mg/kg	-
	LD50 Oral	Rat	1400 mg/kg	-
	LC50 Inhalation Vapor	Rat	8000 ppm	4 hours
Kerosene	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rabbit	2835 mg/kg	-
	LDLo Oral	Human	500 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat	>5000 mg/m³	4 hours

Other information : Not available.

12. Ecological information

Environmental hazards : Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Based on calculation.

Environmental fate : This product contains components which may be persistent in the environment.

13. Disposal considerations

Waste handling and disposal : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	NA1993	Combustible liquids, n.o.s. (Xylene, Petroleum distillates)	Combustible liquid.	III		-
TDG Classification	UN1993	Flammable liquid, n.o.s. (Xylene, Petroleum distillates)	3	III		-
ADR/RID Class	UN1993	Flammable liquid, n.o.s. (Xylene, Petroleum distillates)	3	III		**Hazard identification number** 30 **Special provisions** 640 (E) **Tunnel code** (D/E)
IMDG Class	UN1993	Flammable liquid, n.o.s. (Xylene, Petroleum distillates)	3	III		-Marine pollutant
IATA-DGR Class	UN1993	Flammable liquid, n.o.s. (Xylene, Petroleum distillates)	3	III		-

ADG Class	UN1993	Flammable liquid, n.o.s. (Xylene, Petroleum distillates)	3	III		-

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.

15. Regulatory information

EU regulations

Hazard symbol(s) :

Irritant, Dangerous for the environment

Risk phrases : R10- Flammable.
R37- Irritating to respiratory system.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapors may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S16- Keep away from sources of ignition - No smoking.
S23- Do not breathe vapor.
S57- Use appropriate containment to avoid environmental contamination.

US regulations

SARA 313 toxic chemical notification and release reporting (w/w%) :

Benzene, 1,2,4-trimethyl-	10 - 19.9
Xylene	1 - 4.9
Cumene	1 - 4.9

SARA 311/312 Hazardous Categorization : **SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: Fire hazard, Delayed (chronic) health hazard, Immediate (acute) health hazard

RQ (Reportable quantity) : CERCLA: Hazardous substances.: Xylene: 100 lbs. (45.4 kg); CUMENE: 5000 lbs. (2270 kg); Ethylbenzene: 1000 lbs. (454 kg); Naphthalene: 100 lbs. (45.4 kg); STYRENE: 1000 lbs. (454 kg); Toluene: 1000 lbs. (454 kg); Benzene: 10 lbs. (4.54 kg); P-XYLENE: 100 lbs. (45.4 kg); DODECYLBENZENESULFONIC ACID: 1000 lbs. (454 kg); METHANOL: 5000 lbs. (2270 kg);

State - California Prop. 65 : This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute:
Ethylbenzene
Naphthalene
Toluene
Benzene

Canadian regulations

WHMIS (Classification) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2B: Material causing other toxic effects (Toxic).

HMIRC Registry Number : 8372

Claim granted. : Claim filed: November 15, 2011

International Inventory Status

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

Canada inventory : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

Japan inventory (ENCS) : At least one component is not listed.

Australia inventory (AICS) : At least one component is not listed.

Korea inventory (KECI) : At least one component is not listed.

China inventory (IECSC) : At least one component is not listed.

Philippines inventory (PICCS) : At least one component is not listed.

16. Other information

PREPARATION INFORMATION

Validated by HS&E Department (Tel: +1 804 788 5800) on 11/15/2011.

Date of printing : 11/15/2011.

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.

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Full text of R-phrases appearing in section 3: :
R10- Flammable.
R20- Harmful by inhalation.
R20/21- Harmful by inhalation and in contact with skin.
R65- Harmful: may cause lung damage if swallowed.
R37- Irritating to respiratory system.
R38- Irritating to skin.
R37/38- Irritating to respiratory system and skin.
R36/37/38- Irritating to eyes, respiratory system and skin.
R66- Repeated exposure may cause skin dryness or cracking.
R67- Vapors may cause drowsiness and dizziness.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

* * * END OF MSDS * * *