

SECTION 1: Identification**1.1. Identification**

Product form	: Substance
Trade name	: METHYL AMYL KETONE (MAK)
CAS No	: 110-43-0
Product code	: FTH0011
Formula	: C7H14O
Synonyms	: 2-heptanone / 2-ketoheptane / amylmethyl ketone / butylacetone / FEMA NUMBER 2544 / ketone C-7 / MAK / methyl amyl ketone / methyl pentyl ketone / methylamyl ketone / methyl-n-amylketone / methyl-normal-amyl ketone / n-amyl methyl ketone / normal-amylmethyl ketone / normal-pentyl methyl ketone / n-pentyl methyl ketone / pentyl methyl ketone
BIG no	: 11081

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	: Solvent Coating: component Food industry: Flavouring agent Odorant
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1.3. Details of the supplier of the safety data sheet

Endura Manufacturing Co. Ltd
12425 149 Street
Edmonton, T5L 2J6 - Canada
T 780-451-4242 - F 780-452-5079
info@endura.ca - www.endura.ca

1.4. Emergency telephone number

Emergency number	: In the event of an emergency involving dangerous goods: in Canada call CANUTEC at 613-996-6666 or *666 on a cellular phone. in the US call CHEMTREC at 800-424-9300 (Account Name for US is Polyglass Coatings)
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SECTION 2: Hazard(s) identification**2.1. Classification of the substance or mixture****GHS-US classification**

Flam. Liq. 3	H226 - Flammable liquid and vapour
Acute Tox. 4 (Oral)	H302 - Harmful if swallowed
Acute Tox. 4 (Inhalation:vapour)	H332 - Harmful if inhaled

Full text of H-phrases: see section 16

2.2. Label elements**GHS-US labeling**

Hazard pictograms (GHS-US) :



GHS02

GHS07

Signal word (GHS-US)	: Warning
Hazard statements (GHS-US)	: H226 - Flammable liquid and vapor H302+H332 - Harmful if swallowed or if inhaled H336 - May cause drowsiness or dizziness
Precautionary statements (GHS-US)	: P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking P233 - Keep container tightly closed P240 - Ground/bond container and receiving equipment P241 - Use explosion-proof electrical/ventilating/lighting equipment P242 - Use only non-sparking tools P243 - Take precautionary measures against static discharge P261 - Avoid breathing dust/fume/gas/mist/vapors/spray P264 - Wash thoroughly after handling P270 - Do not eat, drink or smoke when using this product P271 - Use only outdoors or in a well-ventilated area

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P312 - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell
P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P312 - Call a poison center or a doctor if you feel unwell
P330 - Rinse mouth
P370+P378 - In case of fire: Use dry chemical powder, alcohol-resistant foam, carbon dioxide (CO₂) to extinguish
P403+P235 - Store in a well-ventilated place. Keep cool
P501 - Dispose of contents/container in accordance with all local, regional, national and international regulations.

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name	Product identifier	%	GHS-US classification
heptan-2-one (Main constituent)	(CAS No) 110-43-0	100	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:vapour), H332

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Rinse with water. Soap may be used. Take victim to a doctor if irritation persists.

First-aid measures after eye contact : Rinse with water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First-aid measures after ingestion : Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Immediately call a poison center or doctor/physician. Call a poison center or a doctor if you feel unwell. Ingestion of large quantities: immediately to hospital.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Central nervous system depression. Headache. Nausea. Dizziness. Disturbances of consciousness. ON HEATING: Irritation of the respiratory tract. Irritation of the nasal mucous membranes.

Symptoms/injuries after skin contact : Tingling/irritation of the skin.

Symptoms/injuries after eye contact : Slight irritation.

Symptoms/injuries after ingestion : AFTER ABSORPTION OF HIGH QUANTITIES: Symptoms similar to those listed under inhalation.

Chronic symptoms : ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Alcohol-resistant foam. Dry chemical powder. Carbon dioxide.

Unsuitable extinguishing media : Do not use a heavy water stream.

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

5.2. Special hazards arising from the substance or mixture

- Fire hazard : DIRECT FIRE HAZARD. Flammable. Gas/vapour flammable with air within explosion limits. INDIRECT FIRE HAZARD. May build up electrostatic charges: risk of ignition. May be ignited by sparks. Reactions involving a fire hazard: see "Reactivity Hazard".
- Explosion hazard : DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard".
- Reactivity : Upon combustion: CO and CO₂ are formed. Decomposes slowly on exposure to air: peroxidation resulting in increased fire or explosion risk. This reaction is accelerated on exposure to temperature rise. Reacts violently with many compounds e.g.: with (strong) oxidizers, with (some) acids/bases and with amines with (increased) risk of fire/explosion.

5.3. Advice for firefighters

- Precautionary measures fire : Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: seal off low-lying areas. Exposure to fire/heat: have neighbourhood close doors and windows.
- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Protective clothing. See "Material-Handling" to select protective clothing.
- Emergency procedures : Mark the danger area. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Wash contaminated clothes. In case of reactivity hazard: consider evacuation.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

- For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Provide equipment/receptacles with earthing. Do not use compressed air for pumping over spills. Heating: dilute combustible gas/vapour with water curtain.
- Methods for cleaning up : Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite or powdered limestone. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Observe normal hygiene standards. Keep container tightly closed. Before use: check for peroxides and eliminate them. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Remove contaminated clothes. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Prohibitions on mixed storage	: KEEP SUBSTANCE AWAY FROM: oxidizing agents. reducing agents. (strong) acids. (strong) bases. amines.
Storage area	: Store in a cool area. Store in a dark area. Ventilation at floor level. Fireproof storeroom. Provide for a tub to collect spills. Provide the tank with earthing. Meet the legal requirements.
Special rules on packaging	: SPECIAL REQUIREMENTS: hermetical. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
Packaging materials	: SUITABLE MATERIAL: aluminium. carbon steel. glass.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

METHYL AMYL KETONE (MAK) (110-43-0)		
ACGIH	ACGIH TWA (ppm)	50 ppm (Methyl n-amyl ketone; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
ACGIH	Remark (ACGIH)	Eye & skin irr
OSHA	OSHA PEL (TWA) (mg/m ³)	465 mg/m ³
OSHA	OSHA PEL (TWA) (ppm)	100 ppm

8.2. Exposure controls

Materials for protective clothing	: GIVE EXCELLENT RESISTANCE: No data available. GIVE GOOD RESISTANCE: butyl rubber. PVA. GIVE LESS RESISTANCE: No data available. GIVE POOR RESISTANCE: No data available.
Hand protection	: Gloves.
Eye protection	: Safety glasses.
Skin and body protection	: Protective clothing.
Respiratory protection	: Insufficient ventilation: wear respiratory protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid.
Color	: Colourless to light yellow
Odor	: Irritating/pungent odour Fruity odour
Odor threshold	: 0.18 - 0.19 ppm 0.84 - 0.89 mg/m ³
pH	: No data available
Melting point	: < -20 °C (1013 hPa)
Freezing point	: No data available
Boiling point	: 148 °C (977-982.3 hPa) 298 °F (977-982.3 hPa)
Flash point	: 41 °C (1014.1 hPa) 106 °F (1014.1 hPa)
Relative evaporation rate (butyl acetate=1)	: 0.34
Flammability (solid, gas)	: No data available
Explosion limits	: 1.1 - 7.9 vol % 47 - 261 g/m ³
Explosive properties	: No data available
Oxidizing properties	: No data available
Vapor pressure	: 3.4 hPa (20 °C)
Vapor pressure at 50 °C	: 9.18 hPa (25 °C)
Relative density	: 0.814 (20 °C)
Relative vapor density at 20 °C	: 3.9
Relative density of saturated gas/air mixture	: 1.0 (20 °C)
Specific gravity / density	: 814 kg/m ³ (20 °C)
Molecular mass	: 114.19 g/mol

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Solubility	: Poorly soluble in water. Soluble in ethanol. Soluble in ether. Water: 0.421 g/100ml (20 °C, poorly soluble)
Log Pow	: 2.26 (Experimental value; EU Method A.8: Partition Coefficient; 30 °C; 2.26; Experimental value; EU Method A.8: Partition Coefficient; 30 °C)
Auto-ignition temperature	: 358 °C (996.3-1006.3 hPa) 676 °F
Decomposition temperature	: No data available
Viscosity	: No data available
Viscosity, kinematic	: 0.979 mm ² /s (20 °C; OECD 114: Viscosity of Liquids)
Viscosity, dynamic	: 0.00077 Pa.s (20 °C)

9.2. Other information

Saturation concentration	: 6.6 g/m ³
VOC content (Regulatory - Less water and exempt solvents)	: 100 % :
Other properties	: Gas/vapour heavier than air at 20°C. Clear. Slightly volatile. May generate electrostatic charges.

SECTION 10: Stability and reactivity

10.1. Reactivity

Upon combustion: CO and CO₂ are formed. Decomposes slowly on exposure to air: peroxidation resulting in increased fire or explosion risk. This reaction is accelerated on exposure to temperature rise. Reacts violently with many compounds e.g.: with (strong) oxidizers, with (some) acids/bases and with amines with (increased) risk of fire/explosion.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat. No flames, No sparks. Eliminate all sources of ignition.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Likely routes of exposure	: Inhalation; Ingestion.; Skin and eyes contact.
Acute toxicity	: Oral: Harmful if swallowed. Inhalation:vapour: Harmful if inhaled.

METHYL AMYL KETONE (MAK) (110-43-0)	
LD50 oral rat	1670 mg/kg (Rat; Experimental value; 1600 mg/kg bodyweight; Rat)
LD50 dermal rat	10300 mg/kg (Rat; Experimental value; OECD 402: Acute Dermal Toxicity; >2000 mg/kg bodyweight; Rat)
LC50 inhalation rat (mg/l)	14 mg/l/4h (Rat; Experimental value; >16.7 mg/l/4h; Rat)
ATE US (oral)	1670.000 mg/kg body weight
ATE US (dermal)	10300.000 mg/kg body weight
ATE US (vapors)	14.000 mg/l/4h
ATE US (dust, mist)	14.000 mg/l/4h

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: EXPOSURE TO HIGH CONCENTRATIONS: Central nervous system depression. Headache. Nausea. Dizziness. Disturbances of consciousness. ON HEATING: Irritation of the respiratory tract. Irritation of the nasal mucous membranes.
Symptoms/injuries after skin contact	: Tingling/irritation of the skin.
Symptoms/injuries after eye contact	: Slight irritation.
Symptoms/injuries after ingestion	: AFTER ABSORPTION OF HIGH QUANTITIES: Symptoms similar to those listed under inhalation.
Chronic symptoms	: ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008. Not classified as dangerous for the environment according to the criteria of Directive 67/548/EEC.
Ecology - air	: Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009). Not included in the list of fluorinated greenhouse gases (Regulation (EC) No 842/2006). TA-Luft Klasse 5.2.5.
Ecology - water	: Slightly harmful to fishes (LC50(96h) 100-1000 mg/l). Harmful to algae.

METHYL AMYL KETONE (MAK) (110-43-0)

LC50 fish 1	131 mg/l (LC50; EPA OPP 72-1; 96 h; Pimephales promelas; Flow-through system; Fresh water; Experimental value)
EC50 Daphnia 2	> 90.1 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna; Semi-static system; Fresh water; Experimental value)
Threshold limit algae 2	98.2 mg/l (EC50; OECD 201: Alga, Growth Inhibition Test; 72 h; Pseudokirchneriella subcapitata; Static system; Fresh water; Experimental value)

12.2. Persistence and degradability

METHYL AMYL KETONE (MAK) (110-43-0)

Persistence and degradability	Readily biodegradable in water. Highly mobile in soil.
BOD (% of ThOD)	0.44

12.3. Bioaccumulative potential

METHYL AMYL KETONE (MAK) (110-43-0)

Log Pow	2.26 (Experimental value; EU Method A.8: Partition Coefficient; 30 °C; 2.26; Experimental value; EU Method A.8: Partition Coefficient; 30 °C)
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).

12.4. Mobility in soil

METHYL AMYL KETONE (MAK) (110-43-0)

Surface tension	0.0591 N/m (21.6 °C)
Log Koc	log Koc,EU Method C.19; 1.45; Experimental value

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Incinerate under surveillance with energy recovery. Do not discharge into surface water.
Additional information	: Do not reuse empty containers. . Handle empty containers with care because residual vapors are flammable.

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1110 n-Amyl methyl ketone, 3, III

UN-No.(DOT) : UN1110

Proper Shipping Name (DOT) : n-Amyl methyl ketone

Transport hazard class(es) (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120

Hazard labels (DOT) : 3 - Flammable liquid



Packing group (DOT) : III - Minor Danger

DOT Packaging Non Bulk (49 CFR 173.xxx) : 203

DOT Packaging Bulk (49 CFR 173.xxx) : 242

DOT Special Provisions (49 CFR 172.102) : B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).
T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3)

TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

DOT Packaging Exceptions (49 CFR 173.xxx) : 150

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Other information : No supplementary information available.

TDG

Transport document description : UN1110 n-AMYL METHYL KETONE (n-AMYL METHYL KETONE), 3, III

UN-No. (TDG) : UN1110

TDG Proper Shipping Name : n-AMYL METHYL KETONE

TDG Primary Hazard Classes : 3 - Class 3 - Flammable Liquids

Packing group : III - Minor Danger

Explosive Limit and Limited Quantity Index : 5

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 60

Transport by sea

UN-No. (IMDG) : 1110

Proper Shipping Name (IMDG) : n-AMYL METHYL KETONE

Class (IMDG) : 3 - Flammable liquids

Packing group (IMDG) : III - substances presenting low danger

EmS-No. (1) : F-E

EmS-No. (2) : S-D

Air transport

No additional information available

METHYL AMYL KETONE (MAK)

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 15: Regulatory information

15.1. US Federal regulations

METHYL AMYL KETONE (MAK) (110-43-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

No additional information available

EU-Regulations

No additional information available

National regulations

No additional information available

15.3. US State regulations

METHYL AMYL KETONE (MAK) (110-43-0)

State or local regulations

U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

Full text of H-phrases:

Acute Tox. 4 (Inhalation:vapour)	Acute toxicity (inhalation:vapour) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Flam. Liq. 3	Flammable liquids Category 3
H226	Flammable liquid and vapor
H302	Harmful if swallowed
H332	Harmful if inhaled

SDS US Endura

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