



## Safety Data Sheet

acc. to OSHA HCS

Printing date 09/09/2020

Reviewed on 09/09/2020

### 1 Identification

· **Product identifier**

· **Product name:** DRO Mixture 1 1000 µg/mL in Hexane

· **Part number:** DRE-YA03010001HE

· **Application of the substance / the mixture** Reference material for laboratory use only

· **Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**

VHG

LGC Standards

276 Abby Road

Manchester, NH 03103

UNITED STATES OF AMERICA

Tel : +1 (603) 622-7660

Fax : +1 (603) 622-5180

Email : [lgcusa@lgcgroup.com](mailto:lgcusa@lgcgroup.com)

Web : [lgcstandards.com](http://lgcstandards.com)

· **Information department:**

Product safety department

eMail : [sds-request@lgcgroup.com](mailto:sds-request@lgcgroup.com)

· **Emergency telephone number:**

For Hazardous Materials or Dangerous Goods Incident  
Spill, Leak, Fire Exposure, or Accident

Call CHEMTREC:

USA & Canada 1-800-424-9300

Rest of the world +1 703-741-5970

### 2 Hazard(s) identification

· **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Repr. 2 H361 Suspected of damaging fertility or the unborn child.

STOT RE 2 H373 May cause damage to organs through prolonged or repeated exposure.

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.



GHS09 Environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.



GHS07

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Skin Irrit. 2      H315 Causes skin irritation.  
STOT SE 3      H336 May cause drowsiness or dizziness.

**· Label elements****· GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

**· Hazard pictograms**

GHS02   GHS07   GHS08   GHS09

**· Signal word Danger****· Hazard-determining components of labeling:**

n-Hexane  
Undecane  
Dodecane  
Tridecane  
Tetradecane  
Pentadecane  
Hexadecane  
Heptadecane  
Octadecane  
Icosane

**· Hazard statements**

H225 Highly flammable liquid and vapor.  
H315 Causes skin irritation.  
H361 Suspected of damaging fertility or the unborn child.  
H336 May cause drowsiness or dizziness.  
H373 May cause damage to organs through prolonged or repeated exposure.  
H304 May be fatal if swallowed and enters airways.  
H411 Toxic to aquatic life with long lasting effects.

**· Precautionary statements**

P210      Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P280      Wear protective gloves/protective clothing/eye protection/face protection.  
P301+P310      If swallowed: Immediately call a poison center/doctor.  
P303+P361+P353      If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P405      Store locked up.  
P501      Dispose of contents/container in accordance with local/regional/national/international regulations.

**· Classification system:****· NFPA ratings (scale 0 - 4)**

Health = 1  
Fire = 3  
Reactivity = 0

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**· HMIS-ratings (scale 0 - 4)**

HEALTH	1	Health = 1
FIRE	3	Fire = 3
REACTIVITY	0	Reactivity = 0

- **Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

### 3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Also contains substances at levels not considered to be hazardous.

**· Dangerous components:**

CAS: 110-54-3	n-Hexane	>95%
RTECS: MN 9275000	Flam. Liq. 2, H225; Repr. 2, H361; STOT RE 2, H373; Asp. Tox. I, H304; Aquatic Chronic 2, H411; Skin Irrit. 2, H315; STOT SE 3, H336	

### 4 First-aid measures

- **Description of first aid measures**
- **General information:**  
Immediately remove any clothing soiled by the product.  
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:**  
Immediately wash with water and soap and rinse thoroughly.  
If skin irritation continues, consult a doctor.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:**  
Rinse mouth. Do not induce vomiting.  
Immediately call a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

### 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

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- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture**  
During heating or in case of fire poisonous gases are produced.
- **Advice for firefighters**
- **Protective equipment:**  
Mouth respiratory protective device.  
Wear self-contained respiratory protective device.

### 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
Mount respiratory protective device.  
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**  
Inform respective authorities in case of seepage into water course or sewage system.  
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**  
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).  
Dispose contaminated material as waste according to item 13.  
Ensure adequate ventilation.
- **Reference to other sections**  
See Section 7 for information on safe handling.  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

**· PAC-1:**

CAS: 110-54-3	n-Hexane	260 ppm
CAS: 1120-21-4	Undecane	2.3 ppm
CAS: 112-40-3	Dodecane	1.7 ppm
CAS: 629-50-5	Tridecane	0.0073 ppm
CAS: 629-59-4	Tetradecane	3.1 ppm
CAS: 629-62-9	Pentadecane	1.3 ppm
CAS: 544-76-3	Hexadecane	35 mg/m <sup>3</sup>
CAS: 629-78-7	Heptadecane	4.3 ppm
CAS: 593-45-3	Octadecane	230 ppm
CAS: 124-18-5	Decane	6.6 ppm

**· PAC-2:**

CAS: 110-54-3	n-Hexane	2900 ppm
CAS: 1120-21-4	Undecane	26 ppm
CAS: 112-40-3	Dodecane	18 ppm
CAS: 629-50-5	Tridecane	0.08 ppm
CAS: 629-59-4	Tetradecane	34 ppm

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CAS: 629-62-9	Pentadecane	15 ppm
CAS: 544-76-3	Hexadecane	380 mg/m <sup>3</sup>
CAS: 629-78-7	Heptadecane	48 ppm
CAS: 593-45-3	Octadecane	385 ppm
CAS: 124-18-5	Decane	73 ppm
<b>· PAC-3:</b>		
CAS: 110-54-3	n-Hexane	8600 ppm
CAS: 1120-21-4	Undecane	150 ppm
CAS: 112-40-3	Dodecane	110 ppm
CAS: 629-50-5	Tridecane	2.3 ppm
CAS: 629-59-4	Tetradecane	200 ppm
CAS: 629-62-9	Pentadecane	87 ppm
CAS: 544-76-3	Hexadecane	2,800 mg/m <sup>3</sup>
CAS: 629-78-7	Heptadecane	290 ppm
CAS: 593-45-3	Octadecane	5,000 ppm
CAS: 124-18-5	Decane	440 ppm

### 7 Handling and storage

**· Handling:****· Precautions for safe handling**

Ensure good ventilation/exhaustion at the workplace.

Store in cool, dry place in tightly closed receptacles.

Open and handle receptacle with care.

Prevent formation of aerosols.

**· Information about protection against explosions and fires:**

Keep ignition sources away - Do not smoke.

Protect against electrostatic charges.

Keep respiratory protective device available.

**· Conditions for safe storage, including any incompatibilities****· Storage:****· Requirements to be met by storerooms and receptacles:**

Please refer to the manufacturers certificate for specific storage and transport temperature conditions.

Store only in the original receptacle unless other advice is given on the CoA.

Keep container in a well-ventilated place. Keep away from sources of ignition and heat.

**· Information about storage in one common storage facility: Store away from foodstuffs.****· Further information about storage conditions:**

Keep receptacle tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

**· Specific end use(s) No further relevant information available.**

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### 8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

**CAS: 110-54-3 n-Hexane**

PEL Long-term value: 1800 mg/m<sup>3</sup>, 500 ppm

REL Long-term value: 180 mg/m<sup>3</sup>, 50 ppm

TLV Long-term value: 176 mg/m<sup>3</sup>, 50 ppm  
Skin; BEI

· **Ingredients with biological limit values:**

**CAS: 110-54-3 n-Hexane**

BEI 0.4 mg/L

Medium: urine

Time: end of shift at end of workweek

Parameter: 2,5-Hexanedione without hydrolysis

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the skin.

Avoid contact with the eyes and skin.

· **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

· **Protection of hands:**

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374



Protective gloves

· **Material of gloves** Nitrile rubber, NBR

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**· Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

**· Eye protection:**

Tightly sealed goggles

### 9 Physical and chemical properties

**· Information on basic physical and chemical properties****· General Information****· Appearance:**

<b>Form:</b>	Liquid
<b>Color:</b>	Colorless
<b>Odor:</b>	Characteristic
<b>Odor threshold:</b>	Not determined.

**· pH-value:** Not determined.**· Change in condition**

<b>Melting point/Melting range:</b>	-95 °C (-139 °F)
<b>Boiling point/Boiling range:</b>	69 °C (156.2 °F)

**· Flash point:** -26 °C (-14.8 °F)**· Flammability (solid, gaseous):** Not determined.**· Ignition temperature:** 240 °C (464 °F)**· Decomposition temperature:** Not determined.**· Auto igniting:** Product is not selfigniting.**· Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.**· Explosion limits:**

<b>Lower:</b>	1.2 Vol %
<b>Upper:</b>	7.4 Vol %

**· Vapor pressure at 20 °C (68 °F):** 160 hPa (120 mm Hg)**· Density at 20 °C (68 °F):** 0.66 g/cm<sup>3</sup> (5.5077 lbs/gal)**· Relative density** Not determined.**· Vapor density** Not determined.**· Evaporation rate** Not determined.**· Solubility in / Miscibility with****Water at 20 °C (68 °F):** 0.1 g/l

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· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity:**

**Dynamic:** Not determined.

**Kinematic:** Not determined.

· **Other information** No further relevant information available.

### 10 Stability and reactivity

· **Reactivity**

Stable under normal conditions.

No further relevant information available.

· **Chemical stability** Stable under normal conditions.

· **Thermal decomposition / conditions to be avoided:**

Formation of toxic gases is possible during heating or in case of fire.

· **Possibility of hazardous reactions** May form flammable/explosive vapour-air mixture.

· **Conditions to avoid**

Sources of ignition

Heat.

· **Incompatible materials:** Strong oxidizing agents.

· **Hazardous decomposition products:** Formation of toxic gases is possible during heating or in case of fire.

### 11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

**CAS: 110-54-3 n-Hexane**

Oral	LD50	5,000 mg/kg (rat)
Dermal	LD50	3,000 mg/kg (rat)

· **Primary irritant effect:**

· **on the skin:** Irritant to skin and mucous membranes.

· **on the eye:** Based on available data, the classification criteria are not met.

· **Sensitization:** Based on available data, the classification criteria are not met.

· **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:

Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

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**· NTP (National Toxicology Program)**

None of the ingredients is listed.

**· OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

**12 Ecological information****· Toxicity****· Aquatic toxicity:****CAS: 110-54-3 n-Hexane**

EC50/48 h 2.1 mg/l (daphnia)

LC50/96 h 2.5 mg/l (fish)

**· Persistence and degradability** No further relevant information available.**· Behavior in environmental systems:****· Bioaccumulative potential** No further relevant information available.**· Mobility in soil** No further relevant information available.**· Ecotoxicological effects:****· Remark:** Toxic for fish**· Additional ecological information:****· General notes:**

Water hazard class 2 (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

Also poisonous for fish and plankton in water bodies.

Toxic for aquatic organisms

**· Results of PBT and vPvB assessment****· PBT:** Not applicable.**· vPvB:** Not applicable.**· Other adverse effects** No further relevant information available.**13 Disposal considerations****· Waste treatment methods****· Recommendation:**

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

**· Uncleaned packagings:****· Recommendation:** Dispose in accordance with national regulations.

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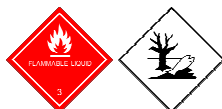
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### 14 Transport information

· UN-Number	UN1208
· DOT, ADR, IMDG, IATA	Hexanes mixture
· DOT	1208 HEXANES mixture, ENVIRONMENTALLY HAZARDOUS
· ADR	HEXANES mixture, MARINE POLLUTANT
· IMDG	HEXANES mixture
· IATA	

· Transport hazard class(es)

· DOT



· Class	3 Flammable liquids
· Label	3

· ADR, IMDG



· Class	3 Flammable liquids
· Label	3

· IATA



· Class	3 Flammable liquids
· Label	3

· Packing group

· DOT, ADR, IMDG, IATA II

· Environmental hazards: Product contains environmentally hazardous substances: n-Hexane

· Marine pollutant: Yes (DOT)  
Symbol (fish and tree)

· Special marking (ADR): Symbol (fish and tree)

· Special precautions for user Warning: Flammable liquids

· Danger code (Kemler): 33

· EMS Number: F-E,S-D

· Stowage Category E

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- |  |   |
|--|---|
| · <b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b> | Not applicable.   |
| · <b>Transport/Additional information:</b>                                       |   |
| · <b>DOT</b>   |   |
| · <b>Remarks:</b>  | Special marking with the symbol (fish and tree).  |
| · <b>ADR</b>   |   |
| · <b>Excepted quantities (EQ)</b>  | Code: E2<br>Maximum net quantity per inner packaging: 30 ml<br>Maximum net quantity per outer packaging: 500 ml |
| · <b>UN "Model Regulation":</b>  | UN 1208 HEXANES MIXTURE, 3, II, ENVIRONMENTALLY HAZARDOUS   |

### 15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

**· Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

**· Section 313 (Specific toxic chemical listings):**

CAS: 110-54-3 | n-Hexane

**· TSCA (Toxic Substances Control Act):**

All components have the value ACTIVE.

**· Hazardous Air Pollutants**

CAS: 110-54-3 | n-Hexane

**· Proposition 65****· Chemicals known to cause cancer:**

None of the ingredients is listed.

**· Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

**· Chemicals known to cause reproductive toxicity for males:**

CAS: 110-54-3 | n-Hexane

**· Chemicals known to cause developmental toxicity:**

None of the ingredients is listed.

**· Carcinogenic categories****· EPA (Environmental Protection Agency)**

CAS: 110-54-3 | n-Hexane

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**· TLV (Threshold Limit Value established by ACGIH)**

None of the ingredients is listed.

**· NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

**· Hazard pictograms**

GHS02 GHS07 GHS08 GHS09

**· Signal word** *Danger***· Hazard-determining components of labeling:**

*n*-Hexane  
Undecane  
Dodecane  
Tridecane  
Tetradecane  
Pentadecane  
Hexadecane  
Heptadecane  
Octadecane  
Icosane

**· Hazard statements**

H225 Highly flammable liquid and vapor.  
H315 Causes skin irritation.  
H361 Suspected of damaging fertility or the unborn child.  
H336 May cause drowsiness or dizziness.  
H373 May cause damage to organs through prolonged or repeated exposure.  
H304 May be fatal if swallowed and enters airways.  
H411 Toxic to aquatic life with long lasting effects.

**· Precautionary statements**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P301+P310 If swallowed: Immediately call a poison center/doctor.  
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P405 Store locked up.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**· Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.**16 Other information**

The information in this Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) This document is intended only as a guide to the appropriate precautionary handling of the material by a person

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trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, we cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. We warrant that the chemical meets the specifications set forth on the label. We (LGC/VHG/ARMI) disclaim any other warranties, expressed or implied with regard to the product supplied hereunder, its merchantability or its fitness for a particular purpose. The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. Read all precautionary information.

• **Date of preparation / last revision** 09/09/2020 / -

• **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flam. Liq. 2: Flammable liquids – Category 2

Skin Irrit. 2: Skin corrosion/irritation – Category 2

Repr. 2: Reproductive toxicity – Category 2

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2

Asp. Tox. 1: Aspiration hazard – Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

• **Sources**

Tables 3.1 and 3.2 from Annex 6 of EC 1272/2008, EC 1907/2006, EH40/2005 as amended 2011, Registry of Toxic Effects of Chemical Substances (RTECS), The Dictionary of Substances and their Effects, 1st Edition, IUCLID.

• **Data compared to the previous version altered.** All sections have been updated.