

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

Date of issue: 06/13/2019

Revision date: 06/13/2019

Version: 1.0

### SECTION 1: Identification

#### 1.1. Identification

Product form : Mixture  
 Product name : Rev VOA IS/Surrogate Mix  
 Product code : AL0-130780

#### 1.2. Recommended use and restrictions on use

No additional information available

#### 1.3. Supplier

Phenova  
 6390 Joyce Dr. Suite 100  
 Golden, CO 80403 - United States  
 T 1-866-942-2978 - F 1-866-283-0269

#### 1.4. Emergency telephone number

No additional information available

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Flammable liquids Category 2	H225	Highly flammable liquid and vapour
Acute toxicity (oral) Category 3	H301	Toxic if swallowed
Acute toxicity (dermal) Category 3	H311	Toxic in contact with skin
Carcinogenicity Category 1B	H350	May cause cancer
Specific target organ toxicity (single exposure) Category 1	H370	Causes damage to organs

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H225 - Highly flammable liquid and vapour  
 H301+H311 - Toxic if swallowed or in contact with skin  
 H350 - May cause cancer  
 H370 - Causes damage to organs

Precautionary statements (GHS-US) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
 P233 - Keep container tightly closed.  
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray.  
 P270 - Do not eat, drink or smoke when using this product.  
 P280 - Wear protective gloves/protective clothing/eye protection/face protection.  
 P301+P310 - If swallowed: Immediately call a poison center or doctor  
 P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower  
 P308+P313 - If exposed or concerned: Get medical advice/attention.  
 P361+P364 - Take off immediately all contaminated clothing and wash it before reuse.  
 P370+P378 - In case of fire: Use media other than water to extinguish.  
 P403+P235 - Store in a well-ventilated place. Keep cool.  
 P501 - Dispose of contents/container to hazardous or special waste collection point, in

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

accordance with local, regional, national and/or international regulation

### 2.3. Other hazards which do not result in classification

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	Conc.
methanol (Component)	(CAS-No.) 67-56-1	86
1-bromo-4-fluorobenzene (Component)	(CAS-No.) 460-00-4	2
Chlorobenzene-d5 (Component)	(CAS-No.) 3114-55-4	2
1,2-Dichloroethane-d4 (Component)	(CAS-No.) 17060-07-0	2
toluene-D8 (Component)	(CAS-No.) 2037-26-5	2
1,4-Dichlorobenzene-d4	(CAS-No.) 3855-82-1	2

Full text of hazard classes and H-statements : see section 16

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

- First-aid measures general : Never give anything by mouth to an unconscious person. IF exposed or concerned: Get medical advice/attention.
- First-aid measures after inhalation : Allow victim to breathe fresh air. Allow the victim to rest.
- First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
- First-aid measures after eye contact : Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.
- First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

### 4.2. Most important symptoms and effects (acute and delayed)

- Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.
- Symptoms/effects : Not expected to present a significant hazard under anticipated conditions of normal use.

### 4.3. Immediate medical attention and special treatment, if necessary

No additional information available

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.
- Unsuitable extinguishing media : Do not use a heavy water stream.

### 5.2. Specific hazards arising from the chemical

No additional information available

### 5.3. Special protective equipment and precautions for fire-fighters

- Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire-fighting water from entering environment.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

- Emergency procedures : Evacuate unnecessary personnel.

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

### 6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.  
Emergency procedures : Ventilate area.

### 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

Methods for cleaning up : Take up in absorbent material. Collect spillage.

### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapor.  
Hygiene measures : Gently wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep container tightly closed and in a well-ventilated place. Keep away from any flames or sparking source.  
Incompatible materials : Direct sunlight.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Rev VOA IS/Surrogate Mix		
ACGIH	Local name	Methanol
ACGIH	ACGIH TWA (ppm)	200 ppm
ACGIH	ACGIH STEL (ppm)	250 ppm
ACGIH	Remark (ACGIH)	Headache; eye dam; dizziness; nausea
ACGIH	Regulatory reference	ACGIH 2018
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	260 mg/m <sup>3</sup>
OSHA	OSHA PEL (TWA) (ppm)	200 ppm
OSHA	Regulatory reference (US-OSHA)	OSHA
1-bromo-4-fluorobenzene (460-00-4)		
Not applicable		
Chlorobenzene-d5 (3114-55-4)		
ACGIH	ACGIH TWA (ppm)	10 ppm (Chlorobenzene; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	350 mg/m <sup>3</sup>
OSHA	OSHA PEL (TWA) (ppm)	75 ppm
1,2-Dichloroethane-d4 (17060-07-0)		
ACGIH	ACGIH TWA (ppm)	10 ppm
toluene-D8 (2037-26-5)		
ACGIH	ACGIH TWA (ppm)	20 ppm (Toluene; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
methanol (67-56-1)		
ACGIH	Local name	Methanol
ACGIH	ACGIH TWA (ppm)	200 ppm (Methanol; USA; Time-weighted average exposure limit 8 h; TLV - Adopted Value)
ACGIH	ACGIH STEL (ppm)	250 ppm (Methanol; USA; Short time value; TLV - Adopted Value)
ACGIH	Remark (ACGIH)	Headache; eye dam; dizziness; nausea

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

methanol (67-56-1)		
ACGIH	Regulatory reference	ACGIH 2018
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	260 mg/m <sup>3</sup>
OSHA	OSHA PEL (TWA) (ppm)	200 ppm
OSHA	Regulatory reference (US-OSHA)	OSHA
1,4-Dichlorobenzene-d4 (3855-82-1)		
ACGIH	ACGIH TWA (ppm)	10 ppm
OSHA	OSHA PEL (TWA) (mg/m <sup>3</sup> )	450 mg/m <sup>3</sup>
OSHA	OSHA PEL (TWA) (ppm)	75 ppm
OSHA	OSHA PEL (STEL) (mg/m <sup>3</sup> )	675 mg/m <sup>3</sup>
OSHA	OSHA PEL (STEL) (ppm)	110 ppm

### 8.2. Appropriate engineering controls

Appropriate engineering controls : Either local exhaust or general room ventilation is usually required.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

Avoid all unnecessary exposure. Gloves. Protective clothing. Protective goggles. Safety glasses.

#### Hand protection:

Wear chemically resistant protective gloves. Wear suitable gloves resistant to chemical penetration

#### Eye protection:

Chemical goggles or safety glasses. Safety glasses

#### Skin and body protection:

Wear chemically protective gloves, lab coat or apron to prevent prolonged or repeated skin contact

#### Respiratory protection:

Wear appropriate mask

#### Personal protective equipment symbol(s):



#### Other information:

Do not eat, drink or smoke during use.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
	: Colorless
	: characteristic
Odor threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

Flammability (solid, gas)	: Non flammable.
Vapor pressure	: No data available
Relative vapor density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosion limits	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No additional information available

### 10.2. Chemical stability

Not established.

### 10.3. Possibility of hazardous reactions

Not established.

### 10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

### 10.5. Incompatible materials

No additional information available

### 10.6. Hazardous decomposition products

No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Not classified

Rev VOA IS/Surrogate Mix	
ATE US (oral)	114.636 mg/kg body weight
ATE US (dermal)	347.97 mg/kg body weight
1-bromo-4-fluorobenzene (460-00-4)	
LD50 oral rat	2248 mg/kg body weight (Rat, Literature study, Oral)
LD50 dermal rat	> 2000 mg/kg body weight (Rat, Literature study, Dermal)
LC50 inhalation rat (mg/l)	18 mg/l (Equivalent or similar to OECD 403, 4 h, Rat, Male, Experimental value, Inhalation (vapours), 14 day(s))
ATE US (oral)	2248 mg/kg body weight
ATE US (gases)	4500 ppmV/4h
ATE US (vapors)	18 mg/l/4h
ATE US (dust, mist)	1.5 mg/l/4h
Chlorobenzene-d5 (3114-55-4)	
LD50 oral rat	> 1427 mg/kg (Rat; Equivalent or similar to OECD 401; Experimental value; >2000 mg/kg bodyweight; Rat)
LD50 dermal rat	> 2000 mg/kg (Rat; Literature study)
LD50 dermal rabbit	> 2200 mg/kg (Rabbit; Literature study)
LC50 inhalation rat (mg/l)	17 mg/l/4h (Rat)
LC50 inhalation rat (ppm)	3630 ppm/4h (Rat)
ATE US (oral)	500 mg/kg body weight

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

<b>Chlorobenzene-d5 (3114-55-4)</b>	
ATE US (gases)	3630 ppmV/4h
ATE US (vapors)	17 mg/l/4h
ATE US (dust, mist)	17 mg/l/4h

<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
LD50 oral rat	670 mg/kg (Rat)
LD50 dermal rabbit	2800 mg/kg (Rabbit, Literature study, Dermal)
LC50 inhalation rat (ppm)	1000 ppm
ATE US (oral)	670 mg/kg body weight
ATE US (dermal)	2800 mg/kg body weight

<b>toluene-D8 (2037-26-5)</b>	
LD50 oral rat	> 2000 mg/kg (Rat)
LD50 dermal rat	> 20 mg/kg (Rat)
LD50 dermal rabbit	> 5000 mg/kg (Rabbit)
LC50 inhalation rat (mg/l)	> 20 mg/l/4h (Rat)

<b>methanol (67-56-1)</b>	
LD50 oral rat	> 5000 mg/kg (Rat; BASF test; Literature study; 1187-2769 mg/kg bodyweight; Rat; Weight of evidence)
LD50 dermal rabbit	15800 mg/kg (Rabbit; Literature study)
LC50 inhalation rat (mg/l)	85 mg/l/4h (Rat; Literature study)
LC50 inhalation rat (ppm)	64000 ppm/4h (Rat; Literature study)
ATE US (oral)	100 mg/kg body weight
ATE US (dermal)	300 mg/kg body weight
ATE US (gases)	700 ppmV/4h
ATE US (vapors)	3 mg/l/4h
ATE US (dust, mist)	0.5 mg/l/4h

<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
LD50 oral rat	500 mg/kg
LD50 dermal rat	> 6000 mg/kg (Rat, Dermal)
LD50 dermal rabbit	> 2000 mg/kg (Rabbit, Dermal)
LC50 inhalation rat (mg/l)	> 5 mg/l (4 h, Rat, Inhalation)
ATE US (oral)	500 mg/kg body weight

Skin corrosion/irritation : Not classified  
Serious eye damage/irritation : Not classified  
Respiratory or skin sensitization : Not classified  
Germ cell mutagenicity : Not classified  
Based on available data, the classification criteria are not met  
Carcinogenicity : May cause cancer.

<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
National Toxicology Program (NTP) Status	Reasonably anticipated to be Human Carcinogen

<b>toluene-D8 (2037-26-5)</b>	
IARC group	3 - Not classifiable

Reproductive toxicity : Not classified  
Based on available data, the classification criteria are not met  
Specific target organ toxicity – single exposure : Causes damage to organs.

Specific target organ toxicity – repeated exposure : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

Symptoms/effects : Not expected to present a significant hazard under anticipated conditions of normal use.

### SECTION 12: Ecological information

#### 12.1. Toxicity

<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
LC50 fish 1	130 mg/l (96 h, Pisces)
<b>Chlorobenzene-d5 (3114-55-4)</b>	
LC50 fish 1	4.5 mg/l (EPA 660/3 - 75/009, 96 h, Lepomis macrochirus, Static system, Fresh water, Experimental value)
EC50 Daphnia 1	26 mg/l (Equivalent or similar to OECD 202, 48 h, Daphnia magna, Static system, Fresh water, Experimental value)
LC50 fish 2	4.7 mg/l (LC50; 96 h)
EC50 Daphnia 2	0.59 mg/l (EC50; OECD 202: Daphnia sp. Acute Immobilisation Test; 48 h; Daphnia magna; Static system; Fresh water; Experimental value)
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
LC50 fish 1	225 mg/l (96 h; Oncorhynchus mykiss (rainbow trout))
EC50 Daphnia 1	540 mg/l (24 h; Daphnia magna)
<b>toluene-D8 (2037-26-5)</b>	
LC50 fish 1	24 mg/l (LC50; 96 h)
EC50 Daphnia 2	11.5 - 19.6 mg/l (EC50; 48 h)
<b>methanol (67-56-1)</b>	
LC50 fish 1	15400 mg/l (LC50; EPA 660/3 - 75/009; 96 h; Lepomis macrochirus; Flow-through system; Fresh water; Experimental value)
EC50 Daphnia 1	> 10000 mg/l (EC50; DIN 38412-11; 48 h; Daphnia magna; Static system; Fresh water; Experimental value)
LC50 fish 2	10800 mg/l (LC50; 96 h; Salmo gairdneri)
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
LC50 fish 1	1.12 mg/l (96 h, Salmo gairdneri, Flow-through system)
EC50 Daphnia 1	0.7 mg/l (48 h, Daphnia magna, Measured concentration)

#### 12.2. Persistence and degradability

<b>Rev VOA IS/Surrogate Mix</b>	
Persistence and degradability	Not established.
<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
Persistence and degradability	Biodegradability in water: no data available.
<b>Chlorobenzene-d5 (3114-55-4)</b>	
Persistence and degradability	Not readily biodegradable in water. Non degradable in the soil. Low potential for adsorption in soil.
Biochemical oxygen demand (BOD)	0.03 g O <sub>2</sub> /g substance
Chemical oxygen demand (COD)	0.41 g O <sub>2</sub> /g substance
ThOD	2.06 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.0145
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
Persistence and degradability	Not readily biodegradable in the soil. Not readily biodegradable in water.
Biochemical oxygen demand (BOD)	0.0014 g O <sub>2</sub> /g substance
Chemical oxygen demand (COD)	1.025 g O <sub>2</sub> /g substance
ThOD	0.98 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.001 (Calculated value)
<b>toluene-D8 (2037-26-5)</b>	
Persistence and degradability	Readily biodegradable in water. Biodegradable in the soil.
Biochemical oxygen demand (BOD)	2.15 g O <sub>2</sub> /g substance

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

<b>toluene-D8 (2037-26-5)</b>	
Chemical oxygen demand (COD)	2.52 g O <sub>2</sub> /g substance
ThOD	3.13 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.69
<b>methanol (67-56-1)</b>	
Persistence and degradability	Readily biodegradable in water. Biodegradable in the soil. Highly mobile in soil.
Biochemical oxygen demand (BOD)	0.6 - 1.12 g O <sub>2</sub> /g substance
Chemical oxygen demand (COD)	1.42 g O <sub>2</sub> /g substance
ThOD	1.5 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.8 (Literature study)
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
Persistence and degradability	Non degradable in the soil. Readily biodegradable in water.
ThOD	1.52 g O <sub>2</sub> /g substance
BOD (% of ThOD)	0.65 (Calculated value)

### 12.3. Bioaccumulative potential

<b>Rev VOA IS/Surrogate Mix</b>	
Bioaccumulative potential	Not established.
<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
Log Pow	3.08 (Experimental value)
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).
<b>Chlorobenzene-d5 (3114-55-4)</b>	
BCF fish 1	447 (BCF)
BCF fish 2	3.9 - 40 (BCF)
Log Pow	2.8 - 2.98
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
BCF fish 1	2 (336 h, <i>Lepomis macrochirus</i> )
Log Pow	1.45 - 1.48 (Experimental value)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).
<b>toluene-D8 (2037-26-5)</b>	
BCF fish 1	13.2 (BCF)
BCF other aquatic organisms 1	380 (BCF; 24 h; <i>Chlorella</i> sp.)
BCF other aquatic organisms 2	4.2 (BCF)
Log Pow	2.11 - 2.8
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).
<b>methanol (67-56-1)</b>	
BCF fish 1	< 10 (BCF; 72 h; <i>Leuciscus idus</i> )
Log Pow	-0.77 (Experimental value; Other)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
BCF fish 1	214 - 720 ( <i>Salmo gairdneri</i> , Chronic)
Log Pow	3.39 - 3.62 (Experimental value)

### 12.4. Mobility in soil

<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
Surface tension	0.0344 N/m
<b>Chlorobenzene-d5 (3114-55-4)</b>	
Surface tension	0.033 N/m (25 °C)
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
Surface tension	0.032 N/m (20 °C)



# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

<b>methanol (67-56-1)</b>	
Surface tension	0.023 N/m (20 °C)
Log Koc	Koc,PCKOCWIN v1.66; 1; Calculated value
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
Surface tension	0.03 N/m (55 °C)

### 12.5. Other adverse effects

<b>Rev VOA IS/Surrogate Mix</b>	
<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
<b>Chlorobenzene-d5 (3114-55-4)</b>	
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
<b>toluene-D8 (2037-26-5)</b>	
<b>methanol (67-56-1)</b>	
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	

Other information : Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose in a safe manner in accordance with local/national regulations.  
Ecology - waste materials : Avoid release to the environment.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1992 Flammable liquids, toxic, n.o.s. (methanol ; ; ), 3 (6.1), II  
UN-No.(DOT) : UN1992  
Proper Shipping Name (DOT) : Flammable liquids, toxic, n.o.s.  
methanol ; ;  
Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120  
Packing group (DOT) : II - Medium Danger  
Subsidiary risk (DOT) : 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132  
Hazard labels (DOT) : 3 - Flammable liquid  
6.1 - Poison



DOT Packaging Non Bulk (49 CFR 173.xxx) : 202  
DOT Packaging Bulk (49 CFR 173.xxx) : 243  
DOT Symbols : G - Identifies PSN requiring a technical name

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

DOT Special Provisions (49 CFR 172.102)	: IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1). 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. T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3) TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively. TP13 - Self-contained breathing apparatus must be provided when this hazardous material is transported by sea.
DOT Packaging Exceptions (49 CFR 173.xxx)	: 150
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: 60 L
DOT Vessel Stowage Location	: B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"
Emergency Response Guide (ERG) Number	: 131
Other information	: No supplementary information available.

### Transportation of Dangerous Goods

Not applicable

### Transport by sea

Transport document description (IMDG)	: UN 1992 FLAMMABLE LIQUID, TOXIC, N.O.S., 3 (6.1), II
UN-No. (IMDG)	: 1992
Proper Shipping Name (IMDG)	: FLAMMABLE LIQUID, TOXIC, N.O.S.
Class (IMDG)	: 3 - Flammable liquids
Packing group (IMDG)	: II - substances presenting medium danger
Subsidiary risks (IMDG)	: 6.1 - Toxic substances

### Air transport

Transport document description (IATA)	: UN 1992 Flammable liquid, toxic, n.o.s., 3 (6.1), II
UN-No. (IATA)	: 1992
Proper Shipping Name (IATA)	: Flammable liquid, toxic, n.o.s.
Class (IATA)	: 3 - Flammable Liquids
Packing group (IATA)	: II - Medium Danger
Subsidiary risks (IATA)	: 6.1 - Toxic substances

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### 1-bromo-4-fluorobenzene (460-00-4)

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

EPA TSCA Regulatory Flag      SP - SP - indicates a substance that is identified in a proposed Significant New Use Rule.

#### Chlorobenzene-d5 (3114-55-4)

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
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# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
Not listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard
<b>toluene-D8 (2037-26-5)</b>	
Not listed on the United States TSCA (Toxic Substances Control Act) inventory	
<b>methanol (67-56-1)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
Listed on EPA Hazardous Air Pollutant (HAPS)	
CERCLA RQ	5000 lb
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Subject to reporting requirements of United States SARA Section 313	
Listed on EPA Hazardous Air Pollutant (HAPS)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Delayed (chronic) health hazard

### 15.2. International regulations

#### CANADA

<b>1-bromo-4-fluorobenzene (460-00-4)</b>	
Listed on the Canadian NDSL (Non-Domestic Substances List)	
<b>Chlorobenzene-d5 (3114-55-4)</b>	
Not listed on the Canadian DSL (Domestic Substances List)/NDSL (Non-Domestic Substances List)	
<b>1,2-Dichloroethane-d4 (17060-07-0)</b>	
Not listed on the Canadian DSL (Domestic Substances List)/NDSL (Non-Domestic Substances List)	
<b>toluene-D8 (2037-26-5)</b>	
Not listed on the Canadian DSL (Domestic Substances List)/NDSL (Non-Domestic Substances List)	
<b>methanol (67-56-1)</b>	
Listed on the Canadian DSL (Domestic Substances List)	
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
Listed on the Canadian DSL (Domestic Substances List)	

#### EU-Regulations

No additional information available

#### National regulations

<b>methanol (67-56-1)</b>	
Listed on EPA Hazardous Air Pollutant (HAPS)	
<b>1,4-Dichlorobenzene-d4 (3855-82-1)</b>	
Listed on IARC (International Agency for Research on Cancer) Listed as carcinogen on NTP (National Toxicology Program) Listed on EPA Hazardous Air Pollutant (HAPS)	

### 15.3. US State regulations

<b>1,2-Dichloroethane-d4 (17060-07-0)</b>					
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)	Maximum allowable dose level (MADL)
Yes	No	No	No		

# Rev VOA IS/Surrogate Mix

## Safety Data Sheet

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

methanol (67-56-1)					
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)	Maximum allowable dose level (MADL)
No	Yes	No	No		47000 µg/day (inhalation); 23,000 µg/day (oral)
1,4-Dichlorobenzene-d4 (3855-82-1)					
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No significant risk level (NSRL)	Maximum allowable dose level (MADL)
Yes	No	No	No		

### SECTION 16: Other information

Revision date : 06/13/2019

Data sources : REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 December 2008 on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

Other information : None.

Full text of H-phrases:

H225	Highly flammable liquid and vapour
H301	Toxic if swallowed
H311	Toxic in contact with skin
H350	May cause cancer
H370	Causes damage to organs

Phenova US SDS REV

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