

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

SECTION 1. IDENTIFICATION

Product name : JEFFCAT® DM-70

Manufacturer or supplier's details

Company name of supplier : Huntsman International LLC
Address : P.O. Box 4980

The Woodlands,
TX 77387
United States of America

Telephone : TechInfo: (281) 719-7780

E-mail address of person responsible for the SDS : MSDS@huntsman.com

Emergency telephone number : Chemtrec: (800) 424-9300 or (703) 527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Component of a Polyurethane System.

SECTION 2. HAZARDS IDENTIFICATION**GHS Classification**

Flammable liquids : Category 3
Acute toxicity (Dermal) : Category 4
Skin corrosion : Category 1C
Serious eye damage : Category 1
Skin sensitisation : Category 1
Acute aquatic toxicity : Category 3
Chronic aquatic toxicity : Category 3

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H226 Flammable liquid and vapour.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
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/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
2,2'-dimorpholinyl-diethyl ether	6425-39-4	60 - 100
1,4-dimethylpiperazine	106-58-1	13 - 30
4,4'-(ethane-1,2-diyl)bismorpholine	1723-94-0	3 - 7

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

- | | |
|---|---|
| General advice | : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended. |
| If inhaled | : If unconscious place in recovery position and seek medical advice.
If symptoms persist, call a physician. |
| In case of skin contact | : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes. |
| In case of eye contact | : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist. |
| If swallowed | : Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital. |
| Most important symptoms and effects, both acute and delayed | : None known. |

SECTION 5. FIREFIGHTING MEASURES

- | | |
|--------------------------------------|---|
| Suitable extinguishing media | : Alcohol-resistant foam
Carbon dioxide (CO ₂)
Dry chemical |
| Unsuitable extinguishing media | : High volume water jet |
| Specific hazards during firefighting | : Do not allow run-off from fire fighting to enter drains or water courses. |

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

- | | |
|---|---|
| Hazardous combustion products | : No hazardous combustion products are known |
| Specific extinguishing methods | : No data is available on the product itself. |
| Further information | : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored separately in closed containments.
Use a water spray to cool fully closed containers. |
| Special protective equipment for firefighters | : Wear self-contained breathing apparatus for firefighting if necessary. |

SECTION 6. ACCIDENTAL RELEASE MEASURES

- | | |
|---|---|
| Personal precautions, protective equipment and emergency procedures | : No action shall be taken involving any personal risk or without suitable training.
Use personal protective equipment.
Remove all sources of ignition.
Evacuate personnel to safe areas.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Ensure adequate ventilation.
In case of inadequate ventilation wear respiratory protection. |
| Environmental precautions | : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities. |
| Methods and materials for containment and cleaning up | : Neutralise with acid.
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). |

SECTION 7. HANDLING AND STORAGE

- | | |
|---|--|
| Advice on protection against fire and explosion | : Do not spray on a naked flame or any incandescent material.
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Keep away from open flames, hot surfaces and sources of ignition. |
| Advice on safe handling | : Avoid formation of aerosol.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the |

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

application area.

Take precautionary measures against static discharges.

Provide sufficient air exchange and/or exhaust in work rooms.

Open drum carefully as content may be under pressure.

To avoid spills during handling keep bottle on a metal tray.

Dispose of rinse water in accordance with local and national regulations.

Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

- Conditions for safe storage : No smoking.
Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.
- Materials to avoid : Keep away from oxidizing agents.
Keep away from strong acids.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

Personal protective equipment

- Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.
Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hand protection
- Remarks : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties.
It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers.
In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
If contact is possible, the following protection should be worn,

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

unless the assessment indicates a higher degree of protection:
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.
Ensure that eyewash stations and safety showers are close to the workstation location.
Eye wash bottle with pure water

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Hygiene measures : When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: amber
Odour	: ammoniacal
Odour Threshold	: No data is available on the product itself.
pH	: 10.4
Boiling point	: 151 °C
Flash point	: 39 °C Method: closed cup
Evaporation rate	: No data is available on the product itself.
Flammability (solid, gas)	: No data is available on the product itself.
Flammability (liquids)	: No data is available on the product itself.
Upper explosion limit	: No data is available on the product itself.
Lower explosion limit	: 2 %(V)
Vapour pressure	: 6.7 hPa (20 °C)
Relative vapour density	: 1
Relative density	: 0.99
Density	: No data is available on the product itself.

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

Solubility(ies)	
Water solubility	: No data is available on the product itself.
Solubility in other solvents	: No data is available on the product itself.
Partition coefficient: n-octanol/water	: No data is available on the product itself.
Auto-ignition temperature	: No data is available on the product itself.
Thermal decomposition	: No data is available on the product itself.
Self-Accelerating decomposition temperature (SADT)	: No data is available on the product itself.
Viscosity	
Viscosity, kinematic	: 5.8 mm ² /s (25 °C)

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Vapours may form explosive mixture with air. No decomposition if stored and applied as directed.
Conditions to avoid	: Heat, flames and sparks.
Hazardous decomposition products	: Nitrogen oxides (NO _x) Carbon dioxide (CO ₂) Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : No data is available on the product itself.

Acute toxicity

Acute oral toxicity - Product : LD50 (Rat, male and female): 3,820 mg/kg

Acute inhalation toxicity : No data available

Acute dermal toxicity - Product : LD50 (Rabbit, male and female): 1,250 mg/kg

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation**Product:**

Remarks: Extremely corrosive and destructive to tissue.

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

Serious eye damage/eye irritation**Product:**

Species: Rabbit

Result: Irreversible effects on the eye

Respiratory or skin sensitisation**Product:**

Remarks: Causes sensitisation.

Assessment: No data available

Germ cell mutagenicity**Components:**

2,2'-dimorpholinyldiethyl ether:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Concentration: 0 - 5000 ug/plate

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

Result: negative

1,4-dimethylpiperazine:

Genotoxicity in vitro : Concentration: 313 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Concentration: 93.8 - 1500 ppm

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476

Result: negative

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 473

Result: negative

Components:

2,2'-dimorpholinyldiethyl ether:

Genotoxicity in vivo : Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

No data available

Carcinogenicity - : No data available
Assessment

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity**Components:**

2,2'-dimorpholinyldiethyl ether:

Effects on fertility

: Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422

1,4-dimethylpiperazine:

Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422

Effects on foetal development

: No data available

Reproductive toxicity - Assessment

: No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity**Components:**

2,2'-dimorpholinyldiethyl ether:

Species: Rat, male and female

: 300 mg/m³

Application Route: Ingestion

Test atmosphere: vapour

Exposure time: 104 Weeks

Number of exposures: 6 h

Method: OECD Test Guideline 452

1,4-dimethylpiperazine:

Species: Rat, male and female

NOAEL: 190 mg/kg

Application Route: Ingestion

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

Exposure time: 1,272 h
Number of exposures: 7 d
Method: Subacute toxicity

Repeated dose toxicity - : No data available
Assessment

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information**Product:**

Remarks: Solvents may degrease the skin.

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:**

2,2'-dimorpholinyldiethyl ether:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 2,150 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

1,4-dimethylpiperazine:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): ca. 100 mg/l

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

Exposure time: 96 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 203
 Remarks: Toxic to aquatic organisms.

Components:

2,2'-dimorpholinyldiethyl ether:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 202

1,4-dimethylpiperazine:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
 Exposure time: 48 h
 Test Type: static test
 Test substance: Fresh water
 Method: Directive 67/548/EEC, Annex V, C.2.

Components:

2,2'-dimorpholinyldiethyl ether:

Toxicity to algae : ErC50 (Selenastrum capricornutum (green algae)): > 100 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201

1,4-dimethylpiperazine:

Toxicity to algae : ErC50 (Selenastrum capricornutum (green algae)): > 100 mg/l
 Exposure time: 72 h
 Test Type: static test
 Test substance: Fresh water
 Method: OECD Test Guideline 201
 GLP: yes

M-Factor (Acute aquatic toxicity) : No data available

Toxicity to fish (Chronic toxicity) : No data available

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : No data available

M-Factor (Chronic aquatic toxicity) : No data available

Components:

2,2'-dimorpholinyldiethyl ether:

Toxicity to bacteria : EC50 (activated sludge): > 1,000 mg/l
 Exposure time: 3 h

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue:
1.1	06/28/2016	400001011979	04/15/2015
			Date of first issue: 04/15/2015

Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

1,4-dimethylpiperazine:

Toxicity to bacteria : EC50 (*Pseudomonas putida*): > 1,250 mg/l
Exposure time: 16 h
Test Type: static test
Test substance: Fresh water
Method: DIN 38 412 Part 8
GLP:

Toxicity to soil dwelling organisms : No data available

Plant toxicity : No data available

Sediment toxicity : No data available

Toxicity to terrestrial organisms : No data available

Ecotoxicology Assessment
Acute aquatic toxicity : No data available

Chronic aquatic toxicity : No data available

Toxicity Data on Soil : No data available

Other organisms relevant to the environment : No data available

Further information:
No data available

Persistence and degradability**Components:****2,2'-dimorpholinyl-diethyl ether:**

Biodegradability : Inoculum: Mixture
Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

1,4-dimethylpiperazine:

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 5.6 %
Exposure time: 28 d

Biochemical Oxygen Demand (BOD) : No data available

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

Chemical Oxygen Demand (COD) : No data available

BOD/COD : No data available

ThOD : No data available

BOD/ThOD : No data available

Dissolved organic carbon (DOC) : No data available

Physico-chemical removability : No data available

Components:

2,2'-dimorpholinyldiethyl ether:

Stability in water : Degradation half life(DT50): 1 yr (55 °C) pH: 7
Method: No information available.
GLP: No information available.
Remarks: Fresh water

Photodegradation : No data available

Impact on Sewage Treatment : No data available

Bioaccumulative potential**Components:**

2,2'-dimorpholinyldiethyl ether:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 3
Exposure time: 56 d
Test substance: Fresh water
Method: flow-through test

Components:

2,2'-dimorpholinyldiethyl ether:

Partition coefficient: n-octanol/water : log Pow: 0.5 (25 °C)
Method: OECD Test Guideline 117
GLP: no

1,4-dimethylpiperazine:

Partition coefficient: n-octanol/water : log Pow: -0.26 (20 °C)
pH: 8 - 8.3
Method: Partition coefficient

Mobility in soil

Mobility : No data available

Components:

2,2'-dimorpholinyldiethyl ether:

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

Distribution among environmental compartments : Koc: 784
1,4-dimethylpiperazine:
Distribution among environmental compartments : Koc: 49
Stability in soil : No data available

Other adverse effects

Environmental fate and pathways : No data available

Results of PBT and vPvB assessment : No data available

Endocrine disrupting potential : No data available

Adsorbed organic bound halogens (AOX) : No data available

Hazardous to the ozone layer

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82
Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Additional ecological information - Product : No data available

Global warming potential (GWP) : No data available

SECTION 13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

SECTION 14. TRANSPORT INFORMATION**International Regulation**

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

IATA

UN/ID No.	: UN 2733
Proper shipping name	: Amines, flammable, corrosive, n.o.s. (N,N'-DIMETHYLPIPERAZINE)
Class	: 3
Subsidiary risk	: 8
Packing group	: III
Labels	: Flammable Liquids, Corrosive
Packing instruction (cargo aircraft)	: 365
Packing instruction (passenger aircraft)	: 354

IMDG

UN number	: UN 2733
Proper shipping name	: AMINES, FLAMMABLE, CORROSIVE, N.O.S. (N,N'-DIMETHYLPIPERAZINE)
Class	: 3
Subsidiary risk	: 8
Packing group	: III
Labels	: 3 (8)
EmS Code	: F-E, S-C
Marine pollutant	: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations**DOT Classification**

UN/ID/NA number	: UN 2733
Proper shipping name	: AMINES, FLAMMABLE, CORROSIVE, N.O.S. (N,N'-DIMETHYLPIPERAZINE)
Class	: 3
Subsidiary risk	: 8
Packing group	: III
Labels	: FLAMMABLE LIQUID, CORROSIVE
ERG Code	: 132
Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION**EPCRA - Emergency Planning and Community Right-to-Know Act**

SARA 311/312 Hazards	: Fire Hazard Acute Health Hazard
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JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

California Prop. 65 This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

CH INV	: The formulation contains substances listed on the Swiss Inventory, On the inventory, or in compliance with the inventory
TSCA	: On the inventory, or in compliance with the inventory
DSL	: All components of this product are on the Canadian DSL
AICS	: On the inventory, or in compliance with the inventory
NZIoC	: On the inventory, or in compliance with the inventory
ENCS	: Low volume exemption, Not in compliance with the inventory
KECI	: On the inventory, or in compliance with the inventory
PICCS	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory
TCSI	: On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

TSCA - 5(a) Significant New Use Rule List of Chemicals

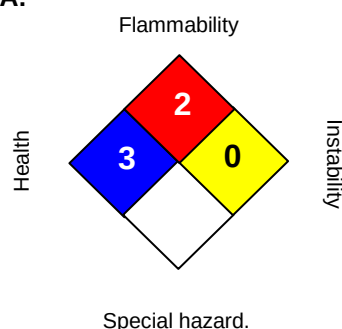
No substances are subject to a Significant New Use Rule.

US. Toxic Substances Control Act (TSCA) Section 12(b) Export Notification (40 CFR 707, Subpt D)

No substances are subject to TSCA 12(b) export notification requirements.

JEFFCAT® DM-70

Version	Revision Date:	SDS Number:	Date of last issue: 04/15/2015
1.1	06/28/2016	400001011979	Date of first issue: 04/15/2015

SECTION 16. OTHER INFORMATION**Further information****NFPA:****HMIS III:**

HEALTH	3
FLAMMABILITY	2
PHYSICAL HAZARD	0

0 = not significant, 1 = Slight,

2 = Moderate, 3 = High

4 = Extreme, * = Chronic

Revision Date : 06/28/2016

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THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

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