

Material Safety Data Sheet

DADE BEHRING

Dimension® system IRN Flex® cartridge

MSDS no.

DEDM0011

1. Product and company identification

- Product name** : Dimension® system IRN Flex® cartridge
- Synonym** : Dimension® clinical chemistry system Flex® reagent cartridge IRN
Iron Flex® reagent cartridge
- Code** : DF49A
- Product type** : Liquid.
- Manufactured/supplied** : Dade Behring Inc.
Corporate Headquarters
1717 Deerfield Road
Deerfield, IL 60015-0778
1-847-267-5300
- Dade Behring Canada Inc.
1200 Courtneypark Drive East
Mississauga, Ontario, Canada
L5T-1P2
(905) 564-7333
(800) 264-0083
- Transportation: (800) 424-9300 (CHEMTREC)
Medical: (800) 228-5635 ext. 284 (Prosar)

2. Hazards identification

- Physical state** : Liquid.
- OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
- Emergency overview** : Warning!
MAY CAUSE SEVERE ALLERGIC SKIN REACTION.
CAUSES EYE AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, NERVOUS SYSTEM, LIVER, HEART, BLADDER, RESPIRATORY TRACT, SKIN, , , EYE, LENS OR CORNEA, TEETH.
SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE CANCER.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.
Harmful if swallowed. Irritating to eyes and skin. May cause sensitization by skin contact. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Contains material that can cause target organ damage. Contains material which may cause cancer. Risk of cancer depends on duration and level of exposure. Wash thoroughly after handling.
- Routes of entry** : Dermal contact. Eye contact. Inhalation.
- Potential acute health effects**
- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : Harmful if swallowed.
- Skin** : Harmful in contact with skin. Irritating to skin. May cause sensitization by skin contact.
- Eyes** : Irritating to eyes.
- Potential chronic health effects**
- Chronic effects** : Contains material that can cause target organ damage.
- Carcinogenicity** : Contains material which may cause cancer.. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.

2 . Hazards identification

- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Over-exposure signs/symptoms**
- Inhalation** : No specific data.
- Ingestion** : No specific data.
- Skin** : Adverse symptoms may include the following:
irritation
redness
- Eyes** : Adverse symptoms may include the following:
pain or irritation
watering
redness

See toxicological information (section 11)

3 . Composition/information on ingredients

United States

<u>Name</u>	<u>CAS number</u>	<u>%</u>
l-ascorbic acid	50-81-7	95
acetic acid, sodium salt	127-09-3	14
acetic acid	64-19-7	11
polyethylene glycol octaphenol ether	9002-93-1	7
poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy- thiourea	25322-68-3	5
2-chloracetamide	62-56-6	1.4
	79-07-2	0.3

Canada

<u>Name</u>	<u>CAS number</u>	<u>%</u>
acetic acid	64-19-7	11
thiourea	62-56-6	1.4

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention.
- Skin contact** : Flush contaminated skin with plenty of water. Continue to rinse for at least 10 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.
- Inhalation** : Get medical attention immediately. Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. The exposed person may need to be kept under medical surveillance for 48 hours.
- Ingestion** : Get medical attention immediately. Move exposed person to fresh air. Loosen tight clothing such as a collar, tie, belt or waistband. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed to do so by medical personnel.

5 . Fire-fighting measures

Flammability of the product : No specific hazard.

Extinguishing media

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

Not suitable : None known.

Hazardous combustion products : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
sulfur oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Do not ingest. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area.

8 . Exposure controls/personal protection

Product name

Exposure limits

United States

acetic acid

ACGIH TLV (United States, 1/2006).

STEL: 37 mg/m³ 15 minute(s).

STEL: 15 ppm 15 minute(s).

TWA: 25 mg/m³ 8 hour(s).

TWA: 10 ppm 8 hour(s).

Canada

acetic acid

ACGIH TLV (United States, 1/2007).

STEL: 37 mg/m³ 15 minute(s).

STEL: 15 ppm 15 minute(s).

TWA: 25 mg/m³ 8 hour(s).

TWA: 10 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

8 . Exposure controls/personal protection

Personal protection

- Respiratory** : 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.
- Hands** : 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.
- Eyes** : 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, gases or dusts.
- Skin** : 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.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

- Physical state** : Liquid.
- pH** : Acidic.
- Boiling/condensation point** : Lowest known value: 100°C (212°F) (water). Weighted average: 101.76°C (215.2°F)
- Melting/freezing point** : May start to solidify at the following temperature: 16.67°C (62°F) This is based on data for the following ingredient: acetic acid. Weighted average: 1.65°C (35°F)
- Critical temperature** : Lowest known value: 321.6°C (610.9°F) (acetic acid).
- Relative density** : Weighted average: 1.24 (Water = 1)
- Vapor pressure** : Highest known value: 2.4 kPa (18 mm Hg) (at 20°C) (water). Weighted average: 2.31 kPa (17.33 mm Hg) (at 20°C)
- Vapor density** : Highest known value: 2.1 (Air = 1) (acetic acid).
- Evaporation rate** : 1.34 (acetic acid) compared with Butyl acetate.
- Viscosity** : Dynamic: Highest known value: 1.22 cP (acetic acid)
- Ionicity (in water)** : Amphoteric. (water).
- Solubility** : Easily soluble in the following materials: cold water.

10 . Stability and reactivity

- Stability** : The product is stable. Under normal conditions of storage and use, hazardous polymerization will not occur.
- Conditions to avoid** : Avoid exposure - obtain special instructions before use.
- Materials to avoid** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Hazardous polymerization** : Will not occur.
- Conditions of reactivity**
- Flammability** : Non-flammable.
- :

11 . Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
l-ascorbic acid	LD50 Intravenous	Rat	>4 g/kg	-
	LD50 Oral	Rat	11900 mg/kg	-
	LD50 Subcutaneous	Rat	>10 g/kg	-
acetic acid, sodium salt	LD50 Dermal	Rabbit	>10 g/kg	-
	LD50 Oral	Rat	3530 mg/kg	-
acetic acid	LD50 Dermal	Rabbit	1060 uL/kg	-
	LD50 Oral	Rat	3310 mg/kg	-
	TDLo Oral	Rat	0.48 mL/kg	-
	TDLo Dermal	Rat	0.25 mg/kg	-
	TDLo Rectal	Rat	300 mg/kg	-
	TDLo Rectal	Rat	0.24 mL/kg	-
	TDLo Rectal	Rat	240 mg/kg	-
	TDLo Rectal	Rat	200 mg/kg	-
	TDLo Implant	Rat	10 mg/kg	-
thiourea	LD50 Intraperitoneal	Rat	436 mg/kg	-
	LD50 Oral	Rat	125 mg/kg	-
	TDLo Oral	Rat	4 mg/kg	-
2-chloracetamide	LD50 Oral	Rat	138 mg/kg	-
	LD50 Unreported	Rat	70 mg/kg	-

Chronic toxicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
l-ascorbic acid	-	-	-	None.	-	-
acetic acid, sodium salt	-	-	-	None.	-	-
acetic acid	-	-	-	None.	-	-
thiourea	-	3	-	None.	Possible	-
2-chloracetamide	-	-	-	None.	-	-

Mutagenicity

Not available.

Teratogenicity

Not available.

Reproductive toxicity

Not available.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
acetic acid	LD50 Dermal	Rabbit	1060 uL/kg	-
	LD50 Oral	Rat	3310 mg/kg	-
	TDLo Oral	Rat	0.48 mL/kg	-
	TDLo Dermal	Rat	0.25 mg/kg	-
	TDLo Rectal	Rat	300 mg/kg	-
	TDLo Rectal	Rat	0.24 mL/kg	-
	TDLo Rectal	Rat	240 mg/kg	-
	TDLo Rectal	Rat	200 mg/kg	-
	TDLo Implant	Rat	10 mg/kg	-
thiourea	LD50	Rat	436 mg/kg	-

11 . Toxicological information

Intraperitoneal				
LD50 Oral	Rat		125 mg/kg	-
TDL0 Oral	Rat		4 mg/kg	-

Chronic toxicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
l-ascorbic acid	-	-	-	None.	-	-
acetic acid, sodium salt	-	-	-	None.	-	-
acetic acid	-	-	-	None.	-	-
thiourea	-	3	-	None.	Possible	-
2-chloroacetamide	-	-	-	None.	-	-

Mutagenicity

Not available.

Teratogenicity

Not available.

Reproductive toxicity

Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
acetic acid	-	Acute EC50 65000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
	-	Acute LC50 88000 ug/L Fresh water	Fish - Pimephales promelas	96 hours
	-	Acute LC50 79000 ug/L Fresh water	Fish - Pimephales promelas	96 hours
	-	Acute LC50 75000 ug/L Fresh water	Fish - Lepomis macrochirus	96 hours
	-	Acute LC50 251000 ug/L Fresh water	Fish - Gambusia affinis	96 hours
poly(oxy-1,2-ethanediyl), α-hydro-ω-hydroxy-	-	Acute LC50 >20000000 ug/L Fresh water	Fish - Carassius carassius	96 hours
	-	Acute LC50 >20000000 ug/L Fresh water	Fish - Oncorhynchus mykiss	96 hours
	-	Acute LC50 >1000000 ug/L Fresh water	Fish - Salmo salar	96 hours
thiourea	-	Acute LC50 9000 to 18000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours

Biodegradability

Not available.

12 . Ecological information

Canada

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
acetic acid	-	Acute EC50 65000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours
	-	Acute LC50 88000 ug/L Fresh water	Fish - Pimephales promelas	96 hours
	-	Acute LC50 79000 ug/L Fresh water	Fish - Pimephales promelas	96 hours
	-	Acute LC50 75000 ug/L Fresh water	Fish - Lepomis macrochirus	96 hours
	-	Acute LC50 251000 ug/L Fresh water	Fish - Gambusia affinis	96 hours
thiourea	-	Acute LC50 9000 to 18000 ug/L Fresh water	Daphnia - Daphnia magna	48 hours

Biodegradability

Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
ADR/RID Class	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Irritating material
Sensitizing material
Carcinogen
Target organ effects

U.S. Federal regulations : TSCA 8(a) PAIR: polyethylene glycol octaphenol ether; thiourea
United States inventory (TSCA 8b): All components are listed or exempted.
TSCA 8(d) H and S data reporting: acetic acid; thiourea: 2006
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: l-ascorbic acid; acetic acid, sodium salt; acetic acid; polyethylene glycol octaphenol ether; thiourea
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: l-ascorbic acid: Delayed (chronic) health hazard; acetic acid, sodium salt: Immediate (acute) health hazard; acetic acid: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; polyethylene glycol octaphenol ether: Immediate (acute) health hazard, Delayed (chronic) health hazard; thiourea: Immediate (acute) health hazard, Delayed (chronic) health hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: acetic acid
Clean Air Act (CAA) 112 accidental release prevention: No products were found.
Clean Air Act (CAA) 112 regulated flammable substances: No products were found.
Clean Air Act (CAA) 112 regulated toxic substances: acetic acid, sodium salt

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: thiourea	62-56-6	1.4
Supplier notification	: thiourea	62-56-6	1.4

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK Hazardous Substances: acetic acid: (environmental hazard, generic environmental hazard); thiourea: (special hazard, environmental hazard, generic environmental hazard)
Florida: acetic acid
Minnesota: acetic acid; poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-hydroxy-; thiourea
Michigan Critical Material: thiourea
Massachusetts Substances: acetic acid; thiourea
Massachusetts Spill: thiourea
New Jersey: acetic acid; thiourea

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
thiourea	Yes.	No.	0.01 µg/day (ingestion)	No.

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

Canada

WHMIS (Canada) : Not a WHMIS controlled material.

15 . Regulatory information

Canadian lists : CEPA DSL: water; l-ascorbic acid; acetic acid, sodium salt; acetic acid; polyethylene glycol octaphenol ether; poly(oxy-1,2-ethanediyl), .alpha.-hydro.-omega.-hydroxy-; thiourea

Canadian NPRI: thiourea

Canadian ARET: thiourea

Canada inventory : **Canada inventory:** All components are listed or exempted.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

16 . Other information

Label requirements : MAY CAUSE SEVERE ALLERGIC SKIN REACTION.
CAUSES EYE AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, NERVOUS SYSTEM, LIVER, HEART, BLADDER, RESPIRATORY
TRACT, SKIN, , , EYE, LENS OR CORNEA, TEETH.
SUSPECT CANCER HAZARD - CONTAINS MATERIAL WHICH MAY CAUSE
CANCER.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.

The customer is responsible for determining the PPE code for this material.

EU regulations

Hazard symbol or symbols :



Risk phrases : R40- Limited evidence of a carcinogenic effect.
R36/38- Irritating to eyes and skin.
R43- May cause sensitization by skin contact.

Safety phrases : S24- Avoid contact with skin.S37- Wear suitable gloves.

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Korea inventory (KECI): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Japan inventory (ENCS): Not determined.

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Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.