Safety Data Sheet

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Document Group:	32-6240-9	**Version Number:**	3.01
Issue Date:	05/26/15	**Supercedes Date:**	10/07/14

Product identifier
Adflo Lithium Ion Turbo System

ID Number(s):

70-0716-2341-0, 70-0716-2342-8, 70-0716-2343-6, 70-0716-2344-4, 70-0716-2345-1, 70-0716-2346-9, 70-0716-2349-3, 70-0716-2350-1, 70-0716-2351-9, 70-0716-2352-7, 70-0716-2353-5, 70-0716-2354-3, 70-0716-2357-6, 70-0716-2358-4, 70-0716-2359-2, 70-0716-2363-4, 70-0716-2364-2, 70-0716-2365-9, 70-0716-2366-7, 70-0716-2367-5, 70-0716-2368-3, 70-0716-2370-9, 70-0716-2371-7, 70-0716-2372-5, 70-0716-2373-3, 70-0716-2374-1, 70-0716-2375-8, 70-0716-2376-6, 70-0716-2377-4, 70-0716-2378-2, 70-0716-2379-0, 70-0716-2380-8, 70-0716-2381-6, 70-0716-2382-4, 70-0716-2383-2, 70-0716-2384-0, 70-0716-8857-9, 70-0716-8862-9

Recommended use
Battery

Supplier's details

MANUFACTURER:	3M
DIVISION:	Personal Safety Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

This product is a kit or a multipart product which consists of multiple, independently packaged components. A Safety Data Sheet (SDS), Article Information Sheet (AIS), or Article Information Letter (AIL) for each of these components is included. Please do not separate the component documents from this cover page. The document numbers for components of this product are:

19-8039-0, 32-6238-3

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Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Adflo Lithium Ion Battery
MANUFACTURER: 3M
DIVISION: Personal Safety Division

ADDRESS: 3M Center, St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 09/14/13
Supercedes Date: Initial Issue

Document Group: 32-6238-3

Product Use:
Intended Use: Battery

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
Lithium transition metal oxidate (Li[M]m[O]n *2)	Unknown	20 - 60
Carbon - Negative Electrode	Unknown	10 - 30
Aluminum, iron, aluminum laminated plastic - Outer Case	Unknown	1 - 30
Organic electrolyte principally involves ester carbonate	Unknown	5 - 25
Copper - Negative Electrode Base	Unknown	1 - 15
Aluminum - Negative Electrode Base	Unknown	1 - 10

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Battery

Odor, Color, Grade: Odorless, metallic, geometric object.
General Physical Form: Solid
Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
No health effects are expected.

Skin Contact:
No health effects are expected.

Inhalation:
No health effects are expected.

Ingestion:
No health effects are expected.

Carcinogenicity:

Ingredient	C.A.S. No.	Class Description	Regulation
Cobalt and inorganic cobalt compounds	S~CO~CE2	Grp. 2B: Possible human carc.	International Agency for Research on Cancer

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

Not determined.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: No need for first aid is anticipated.
Skin Contact: No need for first aid is anticipated.
Inhalation: No need for first aid is anticipated.
If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*Not Applicable*
Flash Point	No flash point
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
OSHA Flammability Classification:	Not Determined

5.2 EXTINGUISHING MEDIA
Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Not applicable.

6.2. Environmental precautions
Not applicable.

Clean-up methods
Collect as much of the spilled material as possible.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

7.2 STORAGE
Store away from acids. Store away from heat. Store out of direct sunlight.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Not applicable.

8.2.2 Skin Protection
Not applicable. Avoid skin contact. Gloves are not required. Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

8.2.3 Respiratory Protection
Not applicable.

8.2.4 Prevention of Swallowing
Not applicable.

8.3 EXPOSURE GUIDELINES

Ingredient	Authority	Type	Limit	Additional Information
Aluminum	ACGIH	TWA, respirable fraction	1 mg/m3	
Aluminum	OSHA	TWA, as Al respirable dust	5 mg/m3	
Aluminum	OSHA	TWA, as Al total dust	15 mg/m3	
Aluminum - Negative Electrode Base	ACGIH	TWA, respirable fraction	1 mg/m3	
Aluminum - Negative Electrode Base	OSHA	TWA, as Al respirable dust	5 mg/m3	
Aluminum - Negative Electrode Base	OSHA	TWA, as Al total dust	15 mg/m3	
Carbon - Negative Electrode	CMRG	TWA	3 fiber/cc	
Cobalt, inorganic compounds	ACGIH	TWA, as Co	0.02 mg/m3	
Copper	ACGIH	TWA, as Cu, fume	0.2 mg/m3	
Copper	ACGIH	TWA, as Cu dust or mist	1 mg/m3	
Copper	OSHA	TWA, as Cu, fume	0.1 mg/m3	
Copper	OSHA	TWA, as Cu dust or mist	1 mg/m3	
Copper - Negative Electrode Base	ACGIH	TWA, as Cu, fume	0.2 mg/m3	
Copper - Negative Electrode Base	ACGIH	TWA, as Cu dust or mist	1 mg/m3	
Copper - Negative Electrode Base	OSHA	TWA, as Cu, fume	0.1 mg/m3	
Copper - Negative Electrode Base	OSHA	TWA, as Cu dust or mist	1 mg/m3	
Graphite	ACGIH	TWA, respirable fraction	2 mg/m3	
Graphite	OSHA	TWA	15 millions of particles/cu. ft.	
GRAPHITE SYNTHETIC	OSHA	TWA, respirable fraction	5 mg/m3	
GRAPHITE SYNTHETIC	OSHA	TWA, as total dust	15 mg/m3	

SOURCE OF EXPOSURE LIMIT DATA:
ACGIH: American Conference of Governmental Industrial Hygienists
CMRG: Chemical Manufacturer Recommended Guideline
OSHA: Occupational Safety and Health Administration
AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Battery
Odor, Color, Grade:	Odorless, metallic, geometric object.
General Physical Form:	Solid
Autoignition temperature	*Not Applicable*
Flash Point	No flash point
Flammable Limits(LEL)	*Not Applicable*

Flammable Limits(UEL)	*Not Applicable*
Boiling Point	*Not Applicable*
Density	*No Data Available*
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Solubility In Water	*Not Applicable*
Evaporation rate	*Not Applicable*
Volatile Organic Compounds	*Not Applicable*
Kow - Oct/Water partition coef	*No Data Available*
Percent volatile	*Not Applicable*
VOC Less H2O & Exempt Solvents	*Not Applicable*
Viscosity	*Not Applicable*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable. Stable to 130 ºC

Materials and Conditions to Avoid:
10.1 Conditions to avoid
Heat

10.2 Materials to avoid
Strong oxidizing agents
Reducing agents
Strong acids
Strong bases

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not applicable.

CHEMICAL FATE INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of waste product in a sanitary landfill.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s):
70-0716-5198-1

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:
Fire Hazard - Yes Pressure Hazard - Yes Reactivity Hazard - Yes Immediate Hazard - No Delayed Hazard - No

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Lithium transition metal oxidate (Li[M]m[O]n *2) (Cobalt, inorganic compounds)	12190-79-3	20 - 60
Lithium transition metal oxidate (Li[M]m[O]n *2) (Cobalt, organic compounds)	12190-79-3	20 - 60
Copper - Negative Electrode Base	7440-50-8	1 - 15
Copper - Negative Electrode Base (Copper)	7440-50-8	1 - 15
Aluminum - Negative Electrode Base	7429-90-5	1 - 10
Aluminum - Negative Electrode Base (Aluminum)	7429-90-5	1 - 10

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 0 **Flammability:** 2 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 0 **Flammability:** 2 **Reactivity:** 0 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS®) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint and Coatings Association (NPCA).

No revision information is available.

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Intermediate - Lithium Manganese Dioxide Battery (Intermediate)
MANUFACTURER: 3M
DIVISION: Occupational Health & Environ. Safety

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 02/01/10
Supercedes Date: 02/02/07

Document Group: 19-8039-0

Product Use:
Intended Use: Battery

SECTION 2: INGREDIENTS

Ingredient	C.A.S. No.	% by Wt
MANGANESE DIOXIDE	1313-13-9	65 - 75
PROPYLENE CARBONATE	108-32-7	10 - 15
1,2-DIMETHOXYETHANE	110-71-4	1 - 10
Graphite, synthetic	7440-44-0	5 - 10
LITHIUM	7439-93-2	5 - 10
Lithium Perchlorate	7791-03-9	1 - 5

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Battery
Odor, Color, Grade: Odorless, metallic, geometric object.

General Physical Form: Solid
Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:
No health effects are expected.

Skin Contact:
No health effects are expected.

Inhalation:
No health effects are expected.

Ingestion:
No health effects are expected.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

Not determined.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: No need for first aid is anticipated.
Skin Contact: No need for first aid is anticipated.
Inhalation: No need for first aid is anticipated.
If Swallowed: No need for first aid is anticipated.

4.2 NOTE TO PHYSICIANS

An initial x-ray should be obtained promptly to determine battery location. Batteries lodged in the esophagus should be removed immediately since leakage, burns and perforation can occur as soon as 4-6 hours after ingestion. Irritation to the internal/external mouth areas may occur following exposure to a leaking battery.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*
OSHA Flammability Classification:	Not Determined

5.2 EXTINGUISHING MEDIA

For burning batteries, use class D extinguisher: Lith-X (preferred), powdered graphite, Met-L-X. Never use Carbon dioxide or ABC-powder extinguishers. Never use water of foam when a fire directly affects cells or batteries. Outside the source of fire use water spray to cool down undamaged containers or packaging.

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: No unusual fire or explosion hazards are anticipated.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures:
Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Ventilate the area with fresh air. Cover, but do not seal for 48 hours.
Not applicable. Place in a metal container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.
Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible using non-sparking tools. Clean up residue.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING
This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. Store in original shipper containers. Store in a cool well-ventilated room.

7.2 STORAGE
Store away from acids. Store away from heat. Store out of direct sunlight. Store at room temperature. Avoid mechanical or electrical abuse. DO NOT short or install incorrectly. Batteries may explode, pyrolize or vent if disassembled, crushed, recharged, or exposed to high temperatures. Install batteries in accordance with equipment instructions. Replace all batteries in equipment at the same time. Do not carry batteries loose in pocket or bag.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS
Not applicable.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection
Not applicable.

8.2.2 Skin Protection
Not applicable. Gloves are not required.

8.2.3 Respiratory Protection
Not applicable.

8.2.4 Prevention of Swallowing
Not applicable.

8.3 EXPOSURE GUIDELINES

None Established

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Battery
Odor, Color, Grade:	Odorless, metallic, geometric object.
General Physical Form:	Solid
Autoignition temperature	*Not Applicable*
Flash Point	*Not Applicable*
Flammable Limits - LEL	*Not Applicable*
Flammable Limits - UEL	*Not Applicable*
Boiling point	*Not Applicable*
Density	*No Data Available*
Vapor Density	*Not Applicable*
Vapor Pressure	*Not Applicable*
Specific Gravity	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Solubility In Water	*Not Applicable*
Evaporation rate	*Not Applicable*
Volatile Organic Compounds	*Not Applicable*
Kow - Oct/Water partition coef	*No Data Available*
Percent volatile	*Not Applicable*
VOC Less H2O & Exempt Solvents	*Not Applicable*
Viscosity	*Not Applicable*

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable. Stable to 130 ºC

Materials and Conditions to Avoid:
10.1 Conditions to avoid
Heat
10.2 Materials to avoid
Strong oxidizing agents, Reducing agents, Strong acids, Strong bases

Additional Information: In case of rupture avoid contact with water.

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not applicable.

CHEMICAL FATE INFORMATION

Not applicable.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Dispose of waste product in a sanitary landfill. No special precautions are required for small quantities. Large quantities of open batteries should be treated as hazardous waste. Dispose of in accordance with ferderal, state and local regulations. Do not incinerate, since batteries may explode at excessive temperatures.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s):
70-0712-7294-5

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - Yes Pressure Hazard - Yes Reactivity Hazard - Yes Immediate Hazard - No Delayed Hazard - No

STATE REGULATIONS
Contact 3M for more information.

CHEMICAL INVENTORIES
This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

Contact 3M for more information.

Additional Information: This product is a Lithium Manganese Dioxide Battery. The component list above refers to the ingredients in the sealed Lithium batteries. Lithium manganese dioxide cells or batteries are not rechargeable. Do not open, punch, crush or burn them. Do not apply greater discharge than indicated. Pay attention to admissible final discharge voltage.

INTERNATIONAL REGULATIONS
Contact 3M for more information.

US LABEL INFORMATION
CAUTION! No adverse health effects are expected for intended industrial handling. Heating may cause an explosion.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 0 **Flammability:** 2 **Reactivity:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 0 **Flammability:** 2 **Reactivity:** 0 **Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS®) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint and Coatings Association (NPCA).

Revision Changes:
Section 16: NFPA hazard classification for health was modified.
Section 16: HMIS hazard classification for health was modified.
Copyright was modified.
Section 3: Potential effects from ingestion information was modified.
Section 8: Skin protection phrase was modified.
Section 10: Hazardous decomposition or by-products table was modified.
Section 9: Property description for optional properties was modified.
Section 13: Waste disposal method information was added.
Section 4: First aid for ingestion (swallowing) - none - was added.
Section 14: ID Number Heading Template 1 was added.
Section 14: ID Number(s) Template 1 was added.
Section 2: Ingredient table was added.

Section 8: Exposure guidelines information - none - was added.
Section 10.1 Conditions to avoid was added.
Section 10.2 Materials to avoid was added.
Section 6: Release measures information was added.
Section 6: Release measures information was added.
Section 6: Release measures information was added.
Section 10: Materials to avoid physical property was added.
Section 10: Conditions to avoid physical property was added.
Section 8: Skin/ hand protection phrase was added.
Section 6: Release measures information was deleted.
Section 4: First aid for skin contact - decontamination - was deleted.
Section 4: First aid for skin contact - medical assistance - was deleted.
Section 4: First aid for ingestion (swallowing) - decontamination - was deleted.
Section 4: First aid for ingestion (swallowing) - medical assistance - was deleted.
Section 10: Materials and conditions to avoid physical property was deleted.

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