SAFETY DATA SHEET

Marshal 35 DS

SDS # : 1328-A
Revision date: 2019-09-25
Format: NA
Version 1.04

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name Marshal 35 DS

Other means of identification

Product Code(s) 1328-A

Synonyms CARBOSULFAN (FMC 35001): 2,3-dihydro-2,2-dimethyl-7-benzofuranyl [(dibutylamino)thio]methylcarbamate (CAS name); 2,3-dihydro-2,2-dimethylbenzofuran-7-yl (dibutylaminothio)methylcarbamate (IUPAC name)

Active Ingredient(s) Carbosulfan

Chemical Family Carbamate Pesticide

Alternate Commercial Name Eltra™; Marshal® 35 ST(D); Marshal 35 DS

Recommended use of the chemical and restrictions on use

Recommended Use: Insecticide

Restrictions on Use: Use as recommended by the label.

Supplier Address

FMC Corporation
2929 Walnut Street
Philadelphia, PA 19104
(215) 299-6000 (General Information)
SDS-Info@fmc.com (E-Mail General Information)

Emergency telephone number

Medical Emergencies :
1 800 / 331-3148 (U.S.A. & Canada)
1 651 / 632-6793 (All Other Countries - Collect)

For leak, fire, spill or accident emergencies, call:
1 800 / 424-9300 (CHEMTREC - U.S.A.)
1 703 / 741-5970 (CHEMTREC - International)
1 703 / 527-3887 (CHEMTREC - Alternate)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 3
Acute toxicity - Inhalation (Dusts/Mists)	Category 2
Skin sensitization	Category 1B
Specific target organ toxicity (single exposure)	Category 1

Specific target organ toxicity (repeated exposure)	Category 1

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Danger

Hazard Statements
H301 - Toxic if swallowed
H317 - May cause an allergic skin reaction
H330 - Fatal if inhaled
H370 - Causes damage to organs
H372 - Causes damage to organs through prolonged or repeated exposure

Precautionary Statements - Prevention
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P271 - Use only outdoors or in a well-ventilated area
P284 - Wear respiratory protection
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves

Precautionary Statements - Response
P320 - Specific treatment is urgent (see supplemental first aid instructions on this label)
P308 + P311 - If exposed or concerned: Call a POISON CENTER or doctor
P302 + P352 - IF ON SKIN: Wash with plenty of water and soap
P333 + P313 - If skin irritation or rash occurs: Get medical advice/attention
P363 - Wash contaminated clothing before reuse
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P310 - Immediately call a POISON CENTER or doctor
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor
P330 - Rinse mouth

Precautionary Statements - Storage
P405 - Store locked up
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal
P501 - Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)
No hazards not otherwise classified were identified.

Other Information
Very toxic to aquatic life with long lasting effects.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Family Carbamate Pesticide.

Chemical name	CAS-No	Weight %

Carbosulfan	55285-14-8	37
Calcium Silicate	1344-95-2	40-50
Diethylene glycol	111-46-6	1-5
Carbofuran	1563-66-2	0.7

Synonyms are provided in Section 1.

4. FIRST AID MEASURES

Eye Contact

Hold eyes open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for further treatment advice.

Skin Contact

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

Inhalation

Move to fresh air. If person is not breathing, contact emergency medical services, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

Ingestion

Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms of exposure may include headache, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration, blurred vision, tearing, pin-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma.

Indication of immediate medical attention and special treatment needed, if necessary

This product contains a reversible cholinesterase inhibitor Atropine sulfate is antidotal If cyanosis is absent: Adults - start treatment by giving 2 mg atropine intravenously or intramuscularly, if necessary, and repeat with 0.4 - 2.0 mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydriasis); Children under 12 - initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 - 0.05 mg/kg body weight Use of oximes such as 2-PAM is controversial Observe patient to ensure that these symptoms do not recur as atropinization wears off If in eyes, instill one drop of homatropine Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care Atropine sulfate is antidotal. If cyanosis is absent: Adults - start treatment by giving 2 mg atropine intravenously or intramuscularly, if necessary, and repeat with 0.4 - 2.0 mg atropine at 15 minute intervals until atropinization occurs (tachycardia, flushed skin, dry mouth, mydriasis); Children under 12 - initial dose = 0.05 mg/kg body weight and repeat dose = 0.02 - 0.05 mg/kg body weight. Use of oximes such as 2-PAM is controversial. Observe patient to ensure that these symptoms do not recur as atropinization wears off. If in eyes, instill one drop of homatropine. Treatment is otherwise controlled removal of exposure followed by symptomatic and supportive care.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Foam. Carbon dioxide (CO_2). Dry chemical. Soft stream or water fog only if necessary.

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition

Explosion data

Sensitivity to Mechanical Impact

No information available.

Sensitivity to Static Discharge

No information available.

Protective equipment and precautions for firefighters

Isolate fire area. Evaluate upwind. As in any fire, wear self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Isolate and post spill area. Remove all sources of ignition. Wear suitable protective clothing,

gloves and eye/face protection. For personal protection see section 8.

Other For further clean-up instructions, call FMC Emergency Hotline number listed in Section 1 "Product and Company Identification" above.

Environmental Precautions Keep people and animals away from and upwind of spill/leak. Keep material out of lakes, streams, ponds, and sewer drains. Keep out of waterways.

Methods for Containment If appropriate, surface water drains should be covered. Minor spills on the floor or other impervious surface should immediately be swept up or preferably vacuumed up using equipment with high efficiency final filter. Transfer to suitable containers. Clean area with detergent and much water. Absorb wash liquid onto inert absorbent such as universal binder, Fuller's earth, bentonite or other absorbent clay and collect in suitable containers. The used containers should be properly closed and labelled.

Methods for cleaning up Sweep up and shovel into suitable containers for disposal. Clean and neutralize spill area, tools and equipment for a minimum contact of one hour with vinegar-alcohol solution, then by bleach, soap, and water. Absorb rinsate and add to the collected waste. Waste must be classified and labeled prior to recycling or disposal. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. Remove and wash contaminated clothing before re-use. Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.

Storage Keep in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep in properly labeled containers. Keep away from food, drink and animal feedingstuffs.

Incompatible products Strong acids, Strong bases, Strong oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Chemical name	ACGIH TLV	OSHA PEL	NIOSH	Mexico
Calcium Silicate (1344-95-2)	TWA: 10 mg/m³ TWA: 3 mg/m³	TWA: 15 mg/m³ TWA: 5 mg/m³	TWA: 10 mg/m³ TWA: 5 mg/m³	Mexico: TWA 10 mg/m³
Carbofuran (1563-66-2)	TWA: 0.1 mg/m³	-	TWA: 0.1 mg/m³	Mexico: TWA 0.1 mg/m³

Chemical name	British Columbia	Quebec	Ontario TWAEV	Alberta
Calcium Silicate (1344-95-2)	TWA: 10 mg/m³ TWA: 3 mg/m³	TWA: 10 mg/m³	TWA: 10 mg/m³	TWA: 10 mg/m³
Carbofuran (1563-66-2)	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³	TWA: 0.1 mg/m³ inhalable fraction and vapor	TWA: 0.1 mg/m³

Appropriate engineering controls

Engineering measures Apply technical measures to comply with the occupational exposure limits. When working in confined spaces (tanks, containers, etc.), ensure that there is a supply of air suitable for breathing and wear the recommended equipment.

Individual protection measures, such as personal protective equipment

Eye/Face Protection For dust, splash, mist or spray exposure, wear chemical protective goggles. Maintain eye wash fountain and quick-drench facilities in work area.

Skin and Body Protection	Wear suitable protective clothing. Protective shoes or boots. Minimize skin contamination by following good industrial hygiene practices.
Hand Protection	Wear chemical protective gloves made of materials such as nitrile or neoprene
Respiratory Protection	For dust, splash, mist or spray exposures wear a full-face air-supplying respirator which is approved for pesticides (U.S. NIOSH/MSHA, EU CEN or comparable certification organization) .
Hygiene measures	Clean water should be available for washing in case of eye or skin contamination. Wash skin prior to eating, drinking, chewing gum or using tobacco. Shower or bathe at the end of working. Remove and wash contaminated clothing before re-use. Launder work clothing separately from regular household laundry.
General information	If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Powder
Physical State	Dry powder
Color	Red
Odor	Phenolic
Odor threshold	No information available
pH	No information available
Melting point/freezing point	Not applicable
Boiling Point/Range	No information available
Flash point	Not applicable
Evaporation Rate	No information available
Flammability (solid, gas)	No information available
Flammability Limit in Air	
Upper flammability limit:	No information available
Lower flammability limit:	No information available
Vapor pressure	No information available
Vapor density	No information available
Relative density	16 - 20 lb/cu ft
Specific gravity	No information available
Water solubility	No information available
Solubility in other solvents	No information available
Partition coefficient	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available
Viscosity, kinematic	No information available
Viscosity, dynamic	No information available
Explosive properties	No information available
Oxidizing properties	No information available
Molecular weight	No information available
Bulk density	No information available

10. STABILITY AND REACTIVITY

Reactivity	Not applicable
Chemical Stability	Stable under recommended storage conditions.
Possibility of Hazardous Reactions	Contact with aqueous acids may produce carbofuran.
Hazardous polymerization	Hazardous polymerization does not occur.
Conditions to avoid	Heat, flames and sparks
Incompatible materials	Strong acids, Strong bases, Strong oxidizing agents.
Hazardous Decomposition Products	Burning produces obnoxious and toxic fumes: Carbon oxides (COx), Sulfur oxides, Nitrogen

oxides (NOx).

11. TOXICOLOGICAL INFORMATION

Product Information

LD50 Oral 131 mg/kg (rat)
LD50 Dermal > 2000 mg/kg (rat)
LC50 Inhalation 0.161 mg/L 4 hr (Calculated Estimated Acute Toxicity - EAT)

Serious eye damage/eye irritation Mildly irritating.
Skin corrosion/irritation Non-irritating.
Sensitization May cause sensitization by skin contact

Chemical name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Calcium Silicate (1344-95-2)	> 5000 mg/kg (Rat)		
Diethylene glycol (111-46-6)	= 12565 mg/kg (Rat)	= 11890 mg/kg (rabbit)	> 4600 mg/m³ (Rat) 4 h

Information on toxicological effects

Symptoms This substance is a reversible cholinesterase-inhibiting pesticide, which elicits symptoms in humans typical of cholinesterase inhibition including headache, light-headedness, weakness, abdominal cramps, nausea, excessive salivation, perspiration and blurred vision. More severe signs of cholinesterase inhibition include tearing, pin-point pupils, excessive respiratory secretions, cyanosis, convulsions, generalized tremor and coma. Excessive cholinesterase inhibition may result in death.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic toxicity Effects are expected to be similar to those that are seen with acute toxicity.

Mutagenicity Carbosulfan: Not genotoxic in laboratory studies

Carcinogenicity Carbosulfan: No evidence of carcinogenicity from animal studies.

Neurological effects Carbosulfan: Chronic exposure of laboratory animals has caused decreased cholinesterase activity (erythrocyte, plasma, and/or brain).

Reproductive toxicity Carbosulfan: No toxicity to reproduction in animal studies.

Developmental toxicity Carbosulfan: Caused fetal incomplete ossification and major vessel variations in animal studies.

STOT - single exposure Causes damage to organs. See listed target organs below.
STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure. See listed target organs below.
Target organ effects Nervous system, Bladder, Gastrointestinal tract, Red blood cells, Acetylcholinesterase Inhibition

Neurological effects Carbosulfan: Chronic exposure of laboratory animals has caused decreased cholinesterase activity (erythrocyte, plasma, and/or brain).

Aspiration hazard No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Carbosulfan (55285-14-8)				
Active Ingredient(s)	Duration	Species	Value	Units
Carbosulfan	48 h EC50	Crustacea	1.5	µg/L
	72 h EC50	Algae	47	mg/L
	96 h LC50	Fish	0.015	mg/L
	21 d NOEC	Crustacea	3.2	µg/L
	21 d NOEC	Fish	3.0	µg/L

Carbofuran (1563-66-2)				
Active Ingredient(s)	Duration	Species	Value	Units
Carbofuran	48 h EC50	Crustacea	0.75	mg/L
	72 h EC50	Algae	19	mg/L
	96 h LC50	Fish	0.18	mg/L
	21 d NOEC	Crustacea	0.23	µg/L
	96 h NOEC	Algae	3.2	mg/L
	21 d NOEC	Fish	5.22	µg/L

Chemical name	**Toxicity to algae**	**Toxicity to fish**	**Toxicity to daphnia and other aquatic invertebrates**
Diethylene glycol 111-46-6		96 h LC50: = 75200 mg/L (Pimephales promelas) flow-through	48 h EC50: = 84000 mg/L (Daphnia magna)
Polyethylene glycol 25322-68-3		24 h LC50: > 5000 mg/L (Carassius auratus)	
Soybean oil, epoxidized 8013-07-8	72 h EC50: = 8 mg/L (Desmodesmus subspicatus)	48 h LC50: = 900 mg/L (Leuciscus idus)	24 h EC50: > 100 mg/L (Daphnia magna)
Sodium lignosulfonate 8061-51-6		48 h LC50: = 7300 mg/L (Oncorhynchus mykiss)	

Persistence and degradability Carbosulfan: Non-persistent. Readily hydrolyzed. Not readily biodegradable. Carbofuran: Non-persistent. Does not readily hydrolyze. Not readily biodegradable.

Bioaccumulation Carbosulfan: The substance has a potential for bioconcentration. Carbofuran: The substance does not have a potential for bioconcentration.

Mobility Carbosulfan: Slightly mobile; not expected to reach groundwater. Carbofuran: Moderately mobile; expected to reach groundwater.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods Improper disposal of excess pesticide, spray mixture, or rinsate is prohibited. If these wastes cannot be disposed of by use according to label instructions, contact appropriate disposal authorities for guidance. Proper personal protective equipment, as described in Sections 7 and 8, must be worn while handling materials for waste disposal.

Contaminated Packaging Containers must be disposed of in accordance with local, state and federal regulations. Refer to the product label for container disposal instructions.

14. TRANSPORT INFORMATION

DOT

UN/ID no UN2757
Proper Shipping Name Carbamate pesticide, solid, toxic
Hazard class 6.1
Packing Group II
Reportable Quantity (RQ) Carbofuran is in an "RQ" quantity when this material meets or exceeds 1,358 pounds per bulk package.
Marine Pollutant Carbosulfan, Carbofuran.
Description UN2757, Carbamate pesticides, solid, toxic (Carbosulfan, Carbofuran), 6.1, PG II, Marine Pollutant, RQ

TDG

UN/ID no	UN2757
Proper Shipping Name	Carbamate pesticide, solid, toxic
Hazard class	6.1
Packing Group	II
Marine Pollutant	Carbosulfan.
Description	UN2757, Carbamate pesticide, solid, toxic mixture (Carbosulfan, Carbofuran), 6.1, PG II, Marine Pollutant

ICAO/IATA

UN/ID no	UN2757
Proper Shipping Name	Carbamate pesticide, solid, toxic
Hazard class	6.1
Packing Group	II
Description	UN2757, Carbamate pesticide, solid, toxic (Carbosulfan, Carbofuran), 6.1, PG II, Marine Pollutant

IMDG/IMO

UN/ID no	UN2757
Proper Shipping Name	Carbamate pesticide, solid, toxic
Hazard class	6.1
Packing Group	II
EmS No.	F-A, S-A
Description	UN2757, Carbamate pesticide, solid, toxic (Carbosulfan, Carbofuran), 6.1, PG II, Marine Pollutant

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical name	CAS-No	Weight %	SARA 313 - Threshold Values %
Carbofuran - 1563-66-2	1563-66-2	0.7	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic health hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Carbofuran 1563-66-2	10 lb			X

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
Carbosulfan 55285-14-8	1000 lb 454 kg	

Carbofuran 1563-66-2	10 lb 4.54 kg	10 lb

FIFRA Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

WARNING
May be fatal if swallowed or inhaled. Harmful if absorbed through skin.
This pesticide is toxic to fish, birds and other wildlife.

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Carbosulfan 55285-14-8	X		
Calcium Silicate 1344-95-2	X	X	X
Diethylene glycol 111-46-6			X
Carbofuran 1563-66-2	X	X	X

International Inventories

Chemical name	TSCA (United States)	DSL (Canada)	EINECS/ELINCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)
Carbosulfan 55285-14-8			X			X		
Calcium Silicate 1344-95-2	X	X	X	X	X	X	X	X
Diethylene glycol 111-46-6	X	X	X	X	X	X	X	X
Carbofuran 1563-66-2	X	X	X	X	X	X	X	X

Mexico - Grade Serious risk, Grade 3

Chemical name	Carcinogen Status	Mexico
Calcium Silicate		Mexico: TWA 10 mg/m³
Carbofuran		Mexico: TWA 0.1 mg/m³

CANADA

WHMIS Statement
This product has been classified in accordance with the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

WHMIS Hazard Class D1A - Very toxic materials
D2A - Very toxic materials

D2B - Toxic materials

16. OTHER INFORMATION

NFPA	**Health Hazards** 4	**Flammability** 1	**Instability** 0	**Special Hazards** -
HMIS	**Health Hazards** 3*	**Flammability** 1	**Physical hazard** 0	**Personal Protection** X

**Indicates a chronic health hazard.*

NFPA/HMIS Ratings Legend Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Revision date: 2019-09-25
Reason for revision: SDS sections updated

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Prepared By:

FMC Corporation

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End of Safety Data Sheet