

<b>1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION</b>
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**Product Name:** ArmorTech TMI 2020  
**EPA Reg. No.:** 228-630  
**Product Type:** Fungicide

**Company Name:** Nufarm Americas Inc.  
 11901 S. Austin Avenue  
 Alsip, IL 60803  
 1-800-345-3330

**Telephone Numbers:** For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident,  
 Call CHEMTREC Day or Night: 1-800-424-9300  
 For Medical Emergencies Only, Call 1-877-325-1840

This product is an EPA FIFRA registered pesticide. Some classifications on this SDS are not exactly the same as on the FIFRA label. Certain sections are superseded by federal law governed by EPA for a registered pesticide. Please see Section 15. REGULATORY INFORMATION for explanation.

<b>2. HAZARDS IDENTIFICATION</b>
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**HEALTH HAZARDS:**

Acute Toxicity Oral	Category 4
Eye Irritation	Category 2B
Carcinogen	Category 2

**ENVIRONMENTAL HAZARDS:**

Hazardous to aquatic environment, acute	Category 1
Hazardous to aquatic environment, chronic	Category 1

**SIGNAL WORD:**

WARNING

**HAZARD STATEMENTS:**

Harmful if swallowed. Causes eye irritation. Suspected of causing cancer. Very toxic to aquatic life with long lasting effects.

**PRECAUTIONARY STATEMENTS**

Obtain special instructions before reuse. Do not handle until all safety precautions have been read and understood. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use personal protective equipment as required. Avoid release to the environment.

IF exposed or concerned: Get medical advice. IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell. Rinse mouth. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice. Collect spillage.

Store locked up.

Dispose of contents in accordance with local, state, and federal regulations.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO.	% BY WEIGHT
Thiophanate-methyl	23564-05-8	19.65
Iprodione	36734-19-7	19.65
Other Ingredients, may contain Propylene Glycol	57-55-6	60.70
Synonyms: Mixture of Thiophanate-methyl and Iprodione		

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

### 4. FIRST AID MEASURES

**If in Eyes:** Hold eye open and rinse slowly and gently with water for several minutes. Remove contact lenses, if present, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If Swallowed:** Call a poison control center or doctor immediately for treatment advice. Rinse mouth. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

**If Inhaled:** Move person to fresh air. Call a poison control center or doctor for further treatment advice.

**If on Skin or Clothing:** Take off contaminated clothing. Rinse skin with plenty of water for several minutes. Call a poison control center or doctor for treatment advice.

**Most Important symptoms/effects, acute and delayed:** Causes eye irritation. May cause skin irritation. Harmful if swallowed. Suspected of causing cancer.

**Indication of Immediate medical attention and special treatment if needed, if necessary:** Immediate medical attention should not be required.

### 5. FIRE FIGHTING MEASURES

**Extinguishing Media:** Recommended for large fires: foam or water spray. Recommended for small fires: dry chemical or carbon dioxide.

**Special Fire Fighting Procedures:** Firefighters should wear NIOSH approved self-contained breathing apparatus and full fire-fighting turn out gear. Dike area to prevent runoff and contamination of water sources. Dispose of fire control water later.

**Unusual Fire and Explosion Hazards:** If water is used to fight fire, contain runoff, using dikes to prevent contamination of water supplies. Dispose of fire control water later.

**Hazardous Decomposition Materials (Under Fire Conditions):** May produce oxides of carbon, nitrogen and sulfur.

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Wear appropriate protective gear for the situation. See Personal Protection information in Section 8.

**Environmental Precautions:** Prevent material from entering public sewer systems or any waterways. Do not flush to drain. Large spills to soil or similar surfaces may necessitate removal of topsoil. The affected area should be removed and placed in an appropriate container for disposal.

**Methods for Containment:** Dike spill using absorbent or impervious materials such as earth, sand or clay. Collect and contain contaminated absorbent and dike material for disposal.

**Methods for Cleanup and Disposal:** Avoid creation of dusty conditions. Scrape up and place in appropriate closed container. Wash entire spill area with a detergent slurry, absorb and sweep into container for disposal. Decontaminate tools and equipment following cleanup. See Section 13: DISPOSAL CONSIDERATIONS for more information.

**Other Information:** Large spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies.

## 7. HANDLING AND STORAGE

**HANDLING:** Avoid contact with eyes or clothing. Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/Personal Protective Equipment (PPE) immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove Personal Protective Equipment (PPE) immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

**STORAGE:** Store in a cool, clean, dry place. Do not store at temperatures exceeding 120°F or at temperatures below 32°F.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Engineering Controls:

Where engineering controls are indicated by specific use conditions or a potential for excessive exposure, use local exhaust ventilation at the point of generation.

**Eye/Face Protection:** Not normally required. To avoid contact with eyes, wear chemical goggles or shielded safety glasses. An emergency eyewash or water supply should be readily accessible to the work area.

**Skin Protection:** Mixers, loaders and others exposed to the concentrate and cleaners/repairers of equipment must wear long-sleeved shirt, long pants, chemical-resistant footwear plus socks, chemical-resistant gloves and chemical-resistant apron.

Applicators using handheld equipment must wear coveralls over long-sleeve shirt and long pants, chemical-resistant footwear plus socks, chemical-resistant gloves, chemical-resistant headgear for overhead exposure.

Applicators using mechanical ground equipment must wear long-sleeved shirt, long pants, shoes and socks.

Applicators using truck-mounted equipment with a handgun at the end of the hose (i.e. for commercial turfgrass or ornamental applications) and all the other handlers not specified above must wear long-sleeved shirt, long pants, shoes, socks and chemical-resistant gloves.

An emergency shower or water supply should be readily accessible to the work area.

**Respiratory Protection:** Not normally required. If vapors or mists exceed acceptable levels, wear NIOSH approved air-purifying respirator with cartridges/canisters approved for use against pesticides.

**General Hygiene Considerations:** Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this material: 1) do not store, use and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored; 2) wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics or using the toilet.

## Exposure Guidelines:

Component	OSHA		ACGIH		Unit
	TWA	STEL	TWA	STEL	
Thiophanate-methyl	NE	NE	NE	NE	NE
Iprodione	NE	NE	NE	NE	NE
Propylene glycol*	NE	NE	NE	NE	

\*10 mg/m<sup>3</sup> AIHA WEEL

NE = Not Established

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	Emulsion liquid
<b>Odor:</b>	No data available
<b>Odor threshold:</b>	No data available
<b>pH:</b>	7-8
<b>Melting point/freezing point:</b>	No data available
<b>Initial boiling point and boiling range</b>	No data available
<b>Flash point:</b>	No data available
<b>Evaporation rate:</b>	No data available
<b>Flammability (solid, gas):</b>	No data available
<b>Upper/lower flammability or explosive limits:</b>	No data available
<b>Vapor pressure:</b>	No data available
<b>Vapor density:</b>	No data available
<b>Relative density:</b>	1.152 g/ml
<b>Solubility(ies):</b>	Soluble
<b>Partition coefficient: n-octanol/water:</b>	No data available
<b>Autoignition temperature:</b>	No data available
<b>Decomposition temperature:</b>	No data available
<b>Viscosity:</b>	344.690 cSt (20° C) and 140.792 cSt (40° C)

**Note:** Physical data are typical values, but may vary from sample to sample. A typical value should not be construed as a guaranteed analysis or as a specification.

### 10. STABILITY AND REACTIVITY

**Reactivity:** Not expected to be reactive.

**Chemical Stability:** This material is stable under normal handling and storage conditions.

**Possibility of Hazardous Reactions:** Hazardous polymerization will not occur.

**Conditions to Avoid:** Excessive heat. Do not store near heat or flame.

**Incompatible Materials:** Strong oxidizing agents: bases and acids.

**Hazardous Decomposition Products:** Under fire conditions may produce oxides of carbon, nitrogen and sulfur.

### 11. TOXICOLOGICAL INFORMATION

**Likely Routes of Exposure:** Dermal, inhalation

**Symptoms of Exposure:** Eye irritation, respiratory irritation

**Eye Contact:** Causes eye irritation.

**Skin Contact:** Minimally toxic based on toxicity studies. May cause slight irritation.

**Ingestion:** Slightly toxic if ingested based on toxicity studies. Harmful if swallowed.

**Inhalation:** Low inhalation toxicity based on toxicity studies.

**Delayed, immediate and chronic effects of exposure:** None reported.

**Toxicological Data:**

Data from laboratory studies conducted are summarized below:

**Oral:** Rat LD<sub>50</sub>: 1,750 mg/kg (female) (estimated based on mortalities for doses tested)

**Dermal:** Rat LD<sub>50</sub>: >5,000 mg/kg

**Inhalation:** Rat 4-hr LC<sub>50</sub>: <2.03 mg/L

**Eye Irritation:** Rabbit: Minimally irritating

**Skin Irritation:** Rabbit: Slightly irritating

**Skin Sensitization:** Not a contact sensitizer in guinea pigs following repeated skin exposure.

**Subchronic (Target Organ) Effects:** Repeated overexposure to thiophanate methyl may cause mild anemia and affect the liver and thyroid. Repeated overexposure to iprodione may cause effects in the liver, adrenal, ovary and/or testes.

**Carcinogenicity / Chronic Health Effects:** Prolonged overexposure to thiophanate methyl may affect the liver and thyroid. Prolonged overexposure to iprodione can cause effects to liver, kidneys, and reproductive system. Thiophanate methyl produced dose-dependent increases in benign liver tumors in mice and thyroid tumors in rats. Iprodione produced benign testicular tumors in rats and benign liver and ovary tumors in mice when tested at a maximum tolerated dose.

**Reproductive Toxicity:** Neither thiophanate methyl nor iprodione caused reproductive toxicity in multi-generation studies in rats.

**Developmental Toxicity:** In a rabbit study with thiophanate methyl, slight skeletal variations and decreased fetal weights were observed at doses that were also toxic to mother animals. Iprodione was not a primary developmental toxicant as only minor delays or variations in fetal development were observed at doses that caused maternal toxicity.

**Genotoxicity:** There have been some positive and some negative studies, but the weight of evidence is that thiophanate methyl is not mutagenic. For iprodione, there is no evidence of effects during *in-vitro* or *in-vivo* studies.

**Assessment Carcinogenicity:**

Component	Regulatory Agency Listing As Carcinogen			
	ACGIH	IARC	NTP	OSHA
Thiophanate-methyl	No	No	No	No
Iprodione	No	No	No	No
Propylene glycol	No	No	No	No

<b>12. ECOLOGICAL INFORMATION</b>
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**Environmental Hazards:** This product is toxic to invertebrates.

**Ecotoxicity:**

Data on Thiophanate Methyl Technical:

96-hour LC<sub>50</sub> Bluegill: >41 ppm

96-hour LC<sub>50</sub> Rainbow Trout: 8.3 ppm

48-hour EC<sub>50</sub> Daphnia: 5.4 ppm

96-hour LC<sub>50</sub> Mysid: 1.1 ppm

Bobwhite Quail 8-day Dietary LC<sub>50</sub>: >10,000 ppm

Mallard Duck Oral LD<sub>50</sub>: 4,640 mg/kg

48-hour Honey Bee Contact LD<sub>50</sub>: >100 µg/bee

**Environmental Fate:**

Thiophanate methyl degrades primarily to MBC whether on foliage, in soil or in water in a matter of days. Both photolysis and hydrolysis are important routes of degradation. MBC is microbially degraded, but stable to aqueous photodegradation, stable to hydrolysis at pH values ranging from 5 to 7 and stable to soil photolysis. Metabolism under aerobic and anaerobic conditions in both soil and water proceeds at a slow rate. Under application conditions, average half-lives are about 20 to 50 days, but may be as short

as a few days with repeated use. The major routes of dissipation for iprodione are hydrolysis in neutral and alkaline environments and microbial degradation under both aerobic and anaerobic conditions. Soil half-lives range from 7 to >60 days and the average soil half-life is 14 days. Degradation rates vary with soil acidity, soil clay contents and history of the soil fungicide treatment. Iprodione is slightly soluble and moderately to well sorbed by most soils.

### 13. DISPOSAL CONSIDERATIONS

#### **Waste Disposal Method:**

Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

**Container Handling and Disposal: Nonrefillable Containers 5 Gallons or Less:** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling, if available, or reconditioning or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration or if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Nonrefillable containers larger than 5 gallons:** Nonrefillable container. Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure-rinsing nozzle in the side of the container, and rinse at about 40 psi for at least 30 seconds. Drain for 10 seconds after the flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by other procedures approved by State and local authorities. Plastic containers are also disposable by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke.

**Refillable containers larger than 5 gallons:** Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for two minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

### 14. TRANSPORTATION INFORMATION

#### **DOT**

#### **< 5 gallons per completed package**

Non Regulated

#### **≥ 5 gallons per completed package**

UN 3082, Environmentally hazardous substances, liquid, n.o.s., 9, III, (thiophanate-methyl), RQ

**IMDG**

UN 3082, Environmentally hazardous substances, liquid, n.o.s., 9, III, (iprodione, thiophanate-methyl), Marine Pollutant

**IATA**

UN 3082, Environmentally hazardous substances, liquid, n.o.s., 9, III, (iprodione, thiophanate-methyl), Marine Pollutant

**15. REGULATORY INFORMATION****EPA FIFRA INFORMATION**

This chemical is a pesticide product registered by the United States 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 (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions for use.

CAUTION. Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Remove and wash contaminated clothing before reuse.

**U.S. FEDERAL REGULATIONS**

TSCA Inventory: This product is exempted from TSCA because it is solely for FIFRA regulated use.

**SARA Hazard Notification/Reporting:**

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370):  
Acute Health, Chronic Health

**Section 313 Toxic Chemical(s):**

Thiophate Methyl (23564-05-8) 19.65%

**Reportable Quantity (RQ) under U.S. CERCLA:**

Thiophate Methyl (23564-05-8) 10lbs

**RCRA Waste Code:**

Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

**State Information:**

Other state regulations may apply. Check individual state requirements.

**California Proposition 65:** Thiophanate methyl Reproductive

**16. OTHER INFORMATION****National Fire Protection Association (NFPA) Hazard Rating:**

**Rating for this product: Health: 1 Flammability: 1 Reactivity: 0**

Hazards Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-ACCEPTED PRODUCT LABELING (attached to and accompanying the product container).

# SAFETY DATA SHEET

ArmorTech TMI 2020

This SDS provides important health, safety and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use, while the labeling provides that information specifically for product use in the ordinary course.

Use, storage and disposal of pesticide products are regulated by the EPA under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) through the product labeling, and all necessary and appropriate precautionary, use, storage, and disposal information is set forth on that labeling. It is a violation of Federal law to use a pesticide product in any manner not prescribed on the EPA-accepted label.

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Nufarm Americas Inc. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Nufarm Americas Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS AND ALL SUCH WARRANTIES ARE HEREBY SPECIFICALLY DISCLAIMED.

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**Supersedes:** October 31, 2014