

March 12, 1996

PM 02 1812-313

**BLUE VIKING®**

**Star Shine Crystals**

**COPPER SULFATE PENTAHYDRATE**

**COPPER SULFATE INSTANT**

**ACCEPTED**

APR - 9 1996

Under the Federal Insecticide,  
Fungicide, and Rodenticide Act,  
as amended, for the pesticide  
registered under  
EPA Reg. No. 1812-313

☐ SNOW

☐ SUPERFINE

☐ POWDER

**ACTIVE INGREDIENT**

Copper Sulfate Pentahydrate ..... 99%

**INERT INGREDIENTS** ..... 1%

**TOTAL** ..... 100%

**COPPER AS METALLIC NOT LESS THAN 25.2%**

For use as an algacide, fungicide, and for formulating  
into end use products for the commodities listed below:

- Aquatic, non-food uses to control algae and mollusks in lakes, potable water reservoirs, ponds (golf, farm, fish and life), fish hatcheries, and crop and non-crop irrigation conveyance systems, ditches, canals and laterals.
- Aquatic, food uses on rice.
- Aquatic, non-food uses in sewer lines to control roots, industrial cooling towers, industrial ponds and sewer and animal feedlot lagoons and pits.
- Terrestrial, non-domestic uses for wood, grain, hay, straw, prevention of fungus, decay, & rot.
- Terrestrial, non-domestic food uses on fruit and nut crops, vegetable crops, and wheat seed treatment.
- Terrestrial, non-domestic, non-food uses on ornamentals and tree wounds.

\* Each formulator using this product to formulate an end use pesticide product is responsible for obtaining an EPA registration for his end use product.

**KEEP OUT OF REACH OF CHILDREN**

**DANGER - PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail).

See side panel for additional precautionary statements.

**STATEMENT OF PRACTICAL TREATMENT**

**IF ON SKIN:** Wash with plenty of soap and water. Get medical attention.

**IF INHALED:** Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention.

**IF IN EYES:** Flush with plenty of water. Call a physician.

**IF SWALLOWED:** Drink promptly a large quantity of milk, egg white, gelatin solution, or if these are not available, large quantities of water. Avoid alcohol.

**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate use of gastric lavage.

**GRIFFIN CORPORATION**  
VALDOSTA, GA 31601

EPA REG. NO. 1812-313

NET CONTENTS 50 LBS. (22.7 KG)

**PRECAUTIONARY STATEMENTS**  
**HAZARDS TO HUMANS (AND DOMESTIC ANIMALS)**  
**DANGER**

Corrosive. Causes irreversible eye damage. Causes severe skin irritation. Harmful if absorbed through the skin or inhaled. May cause skin sensitization reactions in certain individuals. Avoid contact with the skin, eyes, or clothing. Avoid breathing dust.

**PERSONAL PROTECTIVE EQUIPMENT**

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**USER SAFETY RECOMMENDATIONS**

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

**ENVIRONMENTAL HAZARDS**

This pesticide is toxic to fish and aquatic organisms. Do not contaminate water by cleaning or disposal of waste. Consult your State Fish and Game Agency before applying this product to public waters. Permits may be required before treating such waters. For terrestrial uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.

Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. For wood treatment uses do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

**SPECIAL PRECAUTIONS:** Direct application of copper sulfate pentahydrate to water may cause a significant reduction in populations of aquatic invertebrates, plants and fish. Do not treat more than one half of lake or pond at one time in order to avoid depletion of oxygen from decaying vegetation. Allow 1 to 2 weeks between treatment for oxygen levels to recover. Trout and other species of fish may be killed at application rates recommended on this label, especially in soft or acid waters. However, fish toxicity generally decreases when the hardness of water increases.

#### **DIRECTIONS FOR USE**

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

#### **AGRICULTURAL USE REQUIREMENTS**

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for protection of agricultural workers on farms, forests, nurseries, and greenhouses and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks
- Protective eyewear

## STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

**PESTICIDE DISPOSAL:** Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use 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 DISPOSAL:** Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

## GENERAL DIRECTIONS

Do not apply this product through any type of irrigation system.

~~Blue Viking Copper Sulfate Instant~~ effectively controls many species of both filamentous (mat-forming green) and planktonic (single cell blue-green) algae. Use ~~Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant~~ as noted below. When using ~~Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant~~ to control algae, there are many factors to consider, water hardness, temperature of the water, kind and amount of vegetation to be controlled and the amount of water flow.

Algae can be controlled more easily and effectively if treatment with ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ is made soon after plant growth has started. Small amounts of ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ can effectively control algae in water. However, if treatment is delayed until a large amount of algae is present, larger quantities of ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ may be required. Control of algae in water systems is not always permanent. Usually algae is more difficult to control with ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ when water temperatures are low. The dose rates recommended for ~~Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant~~ are based on water temperatures of 60°F or above. Larger quantities of ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ will also be required in hard water. Normally, larger quantities of ~~copper sulfate pentahydrate Blue Viking Copper Sulfate Instant~~ will be required to kill algae in water which is flowing than in a body of stagnant water. If possible, curtail the flow of water before treatment and hold dormant for approximately three days after treatment or until the plants have begun to die. It is usually best to treat algae on a sunny day when the heavy mats of filamentary algae are most likely to be floating on the surface where it can be sprayed directly. If there is some doubt about the concentration to apply, it is generally best to start with a lower concentration and to increase this concentration until the algae is killed.

NOTE: When preparing a ~~copper sulfate pentahydrate~~ Blue Viking Copper Sulfate Instant solution in water, it is best that the mixing container be made of glass or plastic or if a metal container is used, that it be either painted, enameled, or copper-lined. The use of a galvanized container causes a chemical reaction to take place by which the copper displaces the galvanized coating of the container.

NOTE: Agricultural chemicals may perform in an unpredictable manner when tank mixed, especially where several products are involved. Reduced effect on pests or crop injury may occur. Unless recommended on this label or by a state/local expert, it is advisable to test for compatibility and tolerance to crop injury prior to full scale commercial utilization of a new tank mix or tank mixing should not be undertaken.

NOTE: This product may be reactive on metal and masonry surfaces such as galvanized roofing. Avoid contact with metal surfaces. Do not spray on cars, houses, lawn furniture, etc.

NOTE: It must be determined in the selection process if proper application equipment is available and if the waste associated with its use can be properly handled. Materials used in the construction of application equipment is also an important factor as agricultural chemicals are often reactive with soft metals such as aluminum and even some synthetic materials such as plastics, rubbers, etc. Therefore it is necessary when working with equipment containing these materials that they are thoroughly flushed with clean water after each day's use.

**CALCULATED FOR THE AMOUNT OF WATER IMPOUNDED AND FOR THE AMOUNT OF  
COPPER SULFATE PENTAHYDRATE BLUE VIKING COPPER SULFATE INSTANT TO BE  
USED**

Calculate water volume as follows:

1. Obtain surface area by measuring of regular shaped ponds or mapping of irregular ponds or by reference to previously recorded engineering data or maps.
2. Calculate average depth by sounding in a regular pattern and taking the mean of these readings or by reference to previously obtained data.
3. Multiply surface area in feet by average depth in feet to obtain cubic feet of water volume.
4. Multiply surface area in acres by average depth in feet to obtain total acre-feet of water volume.

NOTE: If treated water is to be used as a source of potable water, the metallic copper residual must not exceed 1 ppm (4 ppm copper sulfate pentahydrate).

## ALGAECIDE

~~Blue Viking Star Shine Crystals~~ Blue Viking Copper Sulfate Instant can be used in Slow Moving or Quiescent Bodies of Water Including: Lakes; Potable Water Reservoirs; Golf, Farm, Fish and Fire Ponds; Fish Hatcheries; and Crop and Non-Crop Irrigation Conveyance Systems, Ditches, Canals and Laterals.

**LAKES, POTABLE WATER RESERVOIRS; PONDS (Golf, Farm, Fish and Fire); FISH HATCHERIES; AND CROP AND NON-CROP IRRIGATION CONVEYANCE SYSTEMS, DITCHES, CANALS AND LATERALS** - ~~Blue Viking Star Shine Crystals~~ Blue Viking Copper Sulfate Instant kill Filamentous and Planktonic Algae in water. Apply at a rate of 3-6 pounds per acre foot of water (0.27 ppm - 0.54 ppm (Cu) in the treated water). Apply as a uniform surface spray dissolved in at least 3-5 gallons of water using boat, plane or other pressurized spray device. Apply twice yearly or as needed. Determine the number of acre feet of water to be treated. An acre foot of water is equal to one acre of water one foot deep which equals 328,000 gallons or 2,720,000 pounds.

**How to Apply:** ~~Blue Viking Copper Sulfate Instant~~ can be applied to impounded water by several methods to control algae.

1. **Application by Dragging under Water:** ~~Blue Viking Copper Sulfate Instant~~ can be applied by dragging them in a burlap or fine mesh bag attached to a boat or float so that bags are suspended in the top foot of water until the crystals are dissolved. Drag the bag of crystals first near the shoreline and continue outward by moving as the boat travels in parallel lines about 20 to 100 feet apart until area has been treated or until 1/3 to 1/2 of the surface area has been treated. Continue dragging bag over treated area until the required minimum dose is applied and all crystals are dissolved. Determine the quantity of crystals needed to treat the problem area following direction and cautions on this label.
2. **Application by Spraying Solution on Water Surface:** Dissolve the minimum required dose of Blue Viking Copper Sulfate Instant in water and spray the solution uniformly over the body of water. When spraying a solution of Blue Viking Copper Sulfate Instant, mix product in sufficient water to thoroughly spray the water surface. While the volume per surface acre depends on the type of spray equipment being used, spray volume should be approximately 20 to 500 or more gallons per acre of surface water. Several types of solutioning and spraying equipment may be used. Observe previous cautions on the effect of Blue Viking Copper Sulfate Instant solution on various metals in spraying containers.
3. **Application by Broadcasting:** Dry Blue Viking Copper Sulfate Instant can be broadcast on the water surface using a properly equipped boat. An air blower can be used to discharge these crystals at a specific rate over the surface of the water. When using this method, the wind direction is an important factor. Do not use this method unless completely familiar with this type of application.

4. **Application by Spraying from Airplanes and Helicopters:** Professional personnel licensed by the State Agricultural Extension Service are allowed to apply dry Blue Viking Copper Sulfate Instant in some states.

**CROP AND NON-CROP IRRIGATION CONVEYANCE SYSTEMS, DITCHES, CANALS AND LATERALS** - Blue Viking Copper Sulfate Instant controls the Potomogeton Pondweeds, leafy and sago. Use the continuous application method applying 1.6 to 2.4 lbs per cubic foot per second per day.

**Note:** For best control of leafy and sago pondweeds it is essential to begin copper sulfate additions when water is first turned into the system on ditch to be treated and continued throughout the irrigation season. Blue Viking Copper Sulfate Instant becomes less effective as the bicarbonate alkalinity increases. Its effectiveness is significantly reduced when the bicarbonate alkalinity exceeds about 150 ppm as CaCO<sub>3</sub>. Should Blue Viking Copper Sulfate Instant fail to control pondweeds satisfactorily, it may be necessary to treat the ditch with either a suitable approved herbicide or use mechanical means to remove excess growth. In either case resume Blue Viking Copper Sulfate Instant addition as soon as possible.

**CONTROL OF ALGAE IN RICE/WILD RICE FIELDS** - Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant is recommended for control of Filamentous and Planktonic Algae in rice/wild rice fields. Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant should be applied at a rate of 10 to 15 pounds per acre using boat, plane or other professional device. Use at first sign of algae after the field has been flooded to a depth of 6-8 inches. Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant is especially graded for maximum solubility in this volume of water.

#### **CONTROL OF TADPOLE SHRIMP**

Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant is recommended for the control of tadpole shrimp in rice fields. Blue Viking Star Shine Crystals Blue Viking Copper Sulfate Instant should be applied at a rate of 5 to 10 pounds per acre either dry or dissolved in water using boat, plane or other professional device. Use at the first indication of infestation after the field has been flooded and continue as needed.

#### **SEWER TREATMENT - ROOT DESTROYER\***

To control root growth in sewers\*: Commercial, Institutional, and Municipal Sewers use as follows:

**SEWERS** - Use 2 pounds of Blue Viking Copper Sulfate Instant every 6 to 12 months, applied into each junction or terminal manhole as a preventive measure. Add Blue Viking Copper Sulfate Instant during period of reduced flow; however, a small flow is essential. If reduced flow due to root masses is observed, but not completely stopped, add the Blue Viking Copper Sulfate Instant in the next manhole above the reduced flow area. If completely blocked, use a rod to penetrate the mass so some flow begins before treatment.

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**STORM DRAINS** - Use 2 pounds of Blue Viking Copper Sulfate Instant per drain per year. Apply during a period of light water flow. In dry weather, introduce a flow with a hose. If storm drains become almost plugged, repeat treatment 3 or 4 times at 2-week intervals.

**SEWER PUMPS AND FORCE MAINS** - Place 2 pounds of Blue Viking Copper Sulfate Instant in a cloth bag at the storage well inlet. Repeat as needed.

**\*Do not use as a sewer additive where prohibited by State law. State law prohibits the use of this product in sewage systems in the State of Connecticut.\***

~~For partial stoppage add 0.5 pound of Blue Viking Star Shine Crystals to sewer or drain and flush toward blockage with 5 gallons of water. Repeat at 6 month intervals to prevent growth of new roots.~~

~~For complete stoppage, physically remove the root blockage and repeat as above.~~

#### **WOOD TREATMENT (green, peeled posts)**

**Fungus, Decay, Rot** - Prepare a solution of 18 pounds of sodium chromate in each 26 gallons of water to be used and a separate second solution of 18 pounds of ~~copper sulfate pentahydrate~~ Blue Viking Copper Sulfate Instant in each 24 gallons of water to be used; soak the peeled, green posts, butt end down first in the ~~copper sulfate~~ Blue Viking Copper Sulfate Instant solution for 3 days, then butt end down in the sodium chromate solution for 2 days, and finally turn the post upside down in the sodium chromate solution for 1 additional day, remove and rinse posts with clear water.

#### **BORDEAUX SPRAY MIXTURE**

**How to Understand Bordeaux Formulations** - If the Bordeaux Mixture instructions reads 10-10-100, the first figure means the number of pounds of ~~copper sulfate pentahydrate~~ Blue Viking Copper Sulfate Instant. The second figure means the pounds of hydrated spray lime, and the third figure, the gallons of water to be used. Use as a full coverage spray to runoff.

**How to Prepare a Bordeaux Mixture** - To prepare a Bordeaux mixture, fill a tank with water, one quarter full. Then with agitator running, mix in ~~Blue Viking Star Shine Crystals~~ Blue Viking Copper Sulfate Instant through a copper, bronze, stainless steel or plastic screen. Add water so the tank is three quarters full. Mix in the hydrated spray lime through the screen and finish filling the tank with water.

#### **CROP USE RECOMMENDATIONS**

**ALMOND, APRICOT, PEACH, NECTARINE:** Shot Hole Fungus - Prepare a 10-10-100 Bordeaux and apply as a dormant spray in late fall or early spring.

**ALMOND, APRICOT, CHERRY, PEACH, NECTARINE, PLUM, PRUNE:** Brown Rot Blossom Blight - Prepare a 10-10-100 Bordeaux and apply when buds begin to swell.



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**APPLES: Fireblight** - Mix 5 lbs. of Blue Viking Copper Sulfate Instant in 100 gallons of water and spray uniformly to the point of runoff. Apply in dormant only at silver tip stage. After silver tip severe burn will occur on any exposed green tissue. Do not mix lime to make a Bordeaux spray for this treatment.

**BULBS (EASTER LILY, TULIP, GLADIOLUS): Botrytis blight** - Prepare a 10-10-100 Bordeaux and apply as a foliar spray to one acre. Apply for thorough coverage beginning at the first sign of disease and repeat as needed to control disease at 3 to 10 day intervals. Use the shorter intervals during periods of frequent rains or when severe disease conditions persist. Avoid spray just before flower cutting season if residues are a problem.

**CHERRIES (SWEET): Dead bud, Bacterial canker (*Pseudomonas syringae*)** - Prepare a 12-12-100 Bordeaux. Apply at leaf fall and again in late winter before buds begin to swell. In wet cool Northwest U.S. winters, a third spray may be needed between above sprays.

**CHERRY (SOUR): Leaf Spot** - Prepare a 10-10-100 Bordeaux. Apply as a full coverage spray after petal fall or as recommended by the State Extension Service.

**GRAPES (EXCEPT CALIFORNIA): Downy Mildew** - Prepare and apply a 12-6-100 Bordeaux spray beginning when downy mildew is detected. Repeat as needed to achieve and maintain control. This mixture and its use will exhibit some phytotoxicity on most varieties.

**GRAPES (DORMANT): Powdery mildew** - Apply in spring before bud swell and before any green tissue is present. Use 4 to 8 lbs. of Blue Viking Copper Sulfate Instant per 100 gallons of water. Apply in a high volume spray of 300 gallons water per acre. Direct spray to thoroughly wet the dormant vine, especially the bark of the trunk, head, or cordons.

**OLIVES: Olive leaf spot (Peacock spot), Olive knot** - Prepare a 10-10-100 Bordeaux spray and apply up to 500 gallons per acre. Apply before fall rains begin, usually late October or early November in California. In wet winters, a repeat spray may be needed in mid-winter. In areas with less than 10 inches of annual rainfall, a 5-5-100 Bordeaux spray applied in up to 500 gallons per acre may be used.

**PEACHES: Leaf curl** - Prepare a 10-10-100 Bordeaux and apply at leaf fall or as a dormant spray in late fall or early spring before buds begin to swell. If above sprays for Coryneum blight are made, peach leaf curl also will be controlled.

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**WALNUTS: Walnut Blight** - Apply 15 pounds with 10 pounds of lime in 100 gallons of water. Make application in early pre-bloom before catkin blooms are showing (10-20% pistillate) before or after rain. Use only if Bordeaux mixture has been shown to be non-phytotoxic in your area. If desired, add one-half gallon summer oil emulsion per 100 gallons of water. **PRECAUTION:** Addition of summer oil emulsion to pre-bloom and early bloom sprays may result in plant injury.

### CITRUS

**NOTE:** Adding foliar nutritionals to spray mixtures containing ~~Blue Viking Star Shine Crystals~~ ~~Blue Viking Copper Sulfate Instant~~ or other products and applying to citrus during the post bloom period when young fruit is present may result in spray burn.

**Bacterial blast** - Prepare a 10-10-100 Bordeaux spray and apply a spray in late October to early November or before fall rains begin. Make a complete coverage spray using 10 to 25 gallons per mature tree.

**LEMON, ORANGE, GRAPEFRUIT: Phytophthora Brown Rot** - Prepare a 3-4.5-100 Bordeaux where there is no history of copper injury or a 3-2-6-100 (Zinc Sulfate-Copper Sulfate-Pentahydrate ~~Blue Viking~~ ~~Copper Sulfate Instant~~-Hydrated Lime-Gallons of water) Bordeaux. Spray 6 gallons on skirt of tree 3 to 4 feet high and 2 to 4 gallons on trunk and ground under tree. If *P. Hibernalis* is present, use 10 to 25 gallons to completely cover each tree. Apply in November or December just before or after first rain. In severe Brown Rot season, apply second application in January or February.

**LEMON, ORANGE, GRAPEFRUIT: Septoria Fruit and Leaf Spot; Central California - Brown Rot and Zinc and Copper Deficiencies** - Prepare a 3-2-6-100 Bordeaux and use 10 to 25 gallons to completely cover each tree. Apply in October, November or December before or just after first rain.

### POTATO VINE KILL

Apply 10 lb/acre in 10 to 100 gallons of water (ground equipment) or in 5 to 10 gallons (aerial equipment) with Diquat at vine-kill to enhance vine desiccation and suppress late blight. Additional applications can be made with Diquat if needed to within 7 days of harvest. ~~Blue Viking Star Shine Crystals~~ ~~Blue Viking Copper Sulfate Instant~~ may be applied alone until harvest to suppress late blight.

**NOTE:** This product can be mixed with Diquat for use on potatoes in accordance with the most restrictive of label limitations and precautions. No label dosage rates should be exceeded.

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### WARRANTY STATEMENT

GRIFFIN warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of GRIFFIN. In no case shall GRIFFIN be liable for consequential, special or indirect damages resulting from the use or handling of this product. All such risks shall be assumed by the Buyer. GRIFFIN MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

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