GIVAU

GIV-GA

(BRAND

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. Wash throughly with soap and water after handling.

Do not apply this product in a way that will contact workers or other persons. Only protected handlers may be in the area during application. When handlers use closed metering systems, the handlers requirements may be reduced or modified to long-sleeve shirt, long pants, shoes and socks. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washing, use detergent and hot water. Keep and wash PPE separately from other laundry. Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and wildlife. Keep out of lakes, ponds or streams. 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. 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. Do not contaminate water by cleaning of equipment or disposal of wastes.

PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame.

CAUTION

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMI

STATEMENT OF PRACTICAL TREATMENT

If swallowed: Call a physician or Poison Control Center. Drink 1 2 glasses of water and induce vomiting by touching back of throat with finger, or if available by admininstering syrup of ipecac. If person is unconscious, do not give anything by mouth and do not induce vomiting.

If inhaled: Remove to fresh air and call a physician immediately.

If on skin: Wash with plenty of soap and water. Get medical attention.

If in eyes: Flush eyes with plenty of water. Call a physician if irritation persists.

If on clothing: Remove contaminated clothing and wash before reuse.

Manufactured by: GIVAUDAN-ROURE CORPORATIO
100 Delawanna Avenue, Clifton, N.J. 0701

NET CONTENTS: GAL. LI

LOT NO.

ACCEPTED
MAY 12 1997
Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 824-7

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GIVAUDAN-ROURE

GIV-GARD DXN®*

(BRAND OF DIMETHOXANE) BACTERIOSTAT/FUNGISTAT

CAUTION

IDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

STATEMENT OF PRACTICAL TREATMENT

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ufactured by: GIVAUDAN-ROURE CORPORATION
100 Delawanna Avenue, Clifton, N.J. 07014

T CONTENTS: GAL. LBS.

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ACTIVE INGREDIENT:

2, 6-Dimethyl-m-dioxan-4-ol acetate 87%

INERT INGREDIENTS: 13%

100%

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Giv-Gard DXN®(Brand of Dimethoxane) is a microbial growth inhibiting agent for use only in industrial water-based products as outlined below. It is to be used as directed in Givaudan-Roure Corporation's Technical Bulletin.

For use in the following applications, Giv-Gard DXN should be used at a level of 0.1% - 0.2% by weight of the system to be protected:

- Emulsions (such as latex, PVA. silicone, oil, acrylic, polyethylene, PVC)
- Paints (emulsions)
- Coatings
- Specialty industrial products (such as pigment slurries, dyestuffs, inks, thickeners / gums, lignosulfonates)
- Textile chemicals and finishes (such as dye levelers, textile auxiliaries. softeners, lubricants, antistats. sizings, print pastes)
- Industrial adhesives
- Leather processing liquors (such as dyes and wet processing leather finishes).
- Distillate fuels

NOT FOR RESALE *NOT FOR USE IN COSMETICS*

THIS PRODUCT HAS NOT BEEN CLEARED UNDER THE FEDERAL FOOD, DRUG, AND COSMETIC ACT FOR USE IN THE MANUFACTURE OF ADHESIVES AND COATINGS THAT MAY COME IN CONTACT WITH FOOD.

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STORAGE AND DISPOSAL

Keep container covered. Store in a dry, cool, well-ventilated area avoiding open flames or other sources of ignition.

Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.

PESTICIDE DISPOSAL

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL

Do not reuse empty container. Triple rinse (or equivalent) the container. Then offer to recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

KEEP CONTAINER COVERED-STORE IN A DRY PLACE

NON-WARRANTY: Our recommendations for use of this product are based upon test believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions and established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its mis-use as such, or in combination with other materials.

*U.S. PAT. 3,167,477 EPA Reg. No. 824-7 EPA Est. No. 824-NJ-1

GC-1537-C

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GIV-GARD DXN®

(BRAND OF DIMETHOXANE)

BACTERIOSTAT-FUNGISTAT

ACCEPTED

MAY 12 1997

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. 824-7

TECHNICAL LITERATURE

GIVAUDAN-ROURE CORPORATION
Delawanna Avenue, Clifton, New Jersey 07015-5034 • Tel: (201) 365-8277
FAX: (201) 777-9304 *(201) 365-8000*

GIVAUDAN-ROURE

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GIV-GARD DXN®

(Brand of Dimethoxane)

(2,6-Dimethyl-m-Dioxan-4-ol Acetate)

Bacteriostat - Fungistat

PRODUCT FEATURES

- Non-Formaldehyde
- Non-Formaldehyde Donor
- Liquid Product
- Water-Soluble
- Broad-Spectrum Antimicrobial Activity
- Wide pH Range Usage
- Non-Chlorinated
- Non-Phenolic
- Non-Metallic
- Anionic, Cationic, Non-Ionic Compatible
- Cost-Effective
- CAS #000828-00-2
- Registered U.S. EPA #824-7
- U.S. Patent 3,167,477

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GIV-GARD DXN®

TABLE OF CONTENTS

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MAY 12 1997

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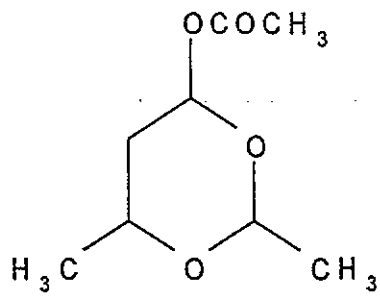
GIV-GARD DXN®

(Brand of Dimethoxane)

Bacteriostat - Fungistat

PHYSICAL AND CHEMICAL PROPERTIES



Chemical Name:	2,6-Dimethyl-m-Dioxan-4-ol Acetate
Synonym:	6-Acetoxy-2,4-Dimethyl-m-Dioxane
Chemical Formula:	$C_8H_{14}O_4$
Molecular Weight:	174.2
Color and Appearance:	Yellow to amber liquid
Specific Gravity @ 25°/25°C:	1.060 - 1.075
Refractive Index @ 20°C:	1.430 - 1.437
Boiling Point:	ca. 210°C
Freezing Point:	Below -25°C
Flash Point:	125°F (TCC)
Solubility:	Soluble in or miscible with water and organic solvents
CAS #:	000828-00-2
EPA Registration #:	824-7
U.S. Patent:	3,167,477

8 7 16

METHOD OF ASSAY

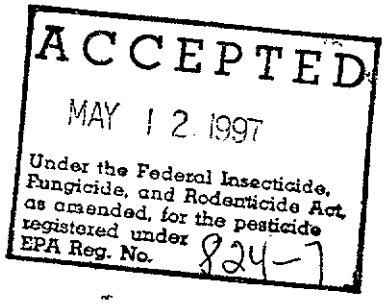
Assay: 85% - 95% (Sum of Two Major Peaks)

Method: Using a gas chromatograph equipped with a Flame Ionization Detector (FID) and an electronic integrator, the analysis is performed on a 30-meter DB Wax fused silica capillary column (0.25 micron film thickness). Typical gas chromatographic operating conditions include:

Injection Split:	50:1
Column Temperature:	50°C increased to 250°C
Temperature Program:	10°C/minute

Inject a 0.2 µL sample using the above operating conditions. Report the sum of the two major peaks.

For additional information concerning the Method of Assay, please consult the enclosed "SPECIFICATIONS/PROCEDURES"



ACTIVITY

Giv-Gard DXN is a reliable preservative product developed by Givaudan-Roure scientists. It functions effectively against various spoilage microorganisms in water-based systems and emulsions.

Microbial growth inhibiting agents used in industry may or may not offer optimum preservative action depending on pH, type of emulsifier, and loss of material into the oil phase of emulsion systems.

Giv-Gard DXN remains in the water phase of aqueous systems and exerts its biological activity over a broad pH range. The product is effective against a wide spectrum of microorganisms and especially effective against Gram-negative bacteria. Gram-negative bacteria are the major organisms involved in bacterial spoilage problems.

Microbiological evaluation of Giv-Gard DXN in various products demonstrated antimicrobial activity against both Gram-negative and Gram-positive bacteria, as well as against various yeasts and fungi at concentrations in the range of 0.07% (700 ppm) to 0.25% (2,500 ppm). The minimum concentrations of Giv-Gard DXN effective in inhibiting various organisms in conventional microbiological tests are shown in Table I.

TABLE I

ANTIMICROBIAL SPECTRUM OF GIV-GARD DXN

Organism	*MIC(ppm)
Staphylococcus aureus	1250
Bacillus subtilis	625
Pseudomonas aeruginosa	625
Pseudomonas fluorescens	625
Brevibacterium ammoniagenes	625
Escherichia coli	625
Aerobacter aerogenes	625
Salmonella typhosa	625
Salmonella choleraesuis	312
Shigella sonnei	625
Saccharomyces cerevisiae	2500
Pityrosporum ovale	625
Candida albicans	1250
Aspergillus niger	1250
Aspergillus flavus	1250
Aspergillus terreus	1250
Aspergillus oryzae	1250
Penicillium piscarium	625
Penicillium species (unknown)	1250

* Minimal inhibitory concentration (ppm) in agar by two-fold serial dilution technique. Bacteria on dextrose tryptone extract agar, 3 days at 34°C. Mold and yeasts on Sabouraud's dextrose agar, 5 days at 30°C.

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APPLICATIONS AND DIRECTIONS FOR USE

Giv-Gard DXN (Brand of Dimethoxane) exhibits excellent preservative performance in a wide array of applications. The product should be used only in the manufacture and/or processing of industrial water-based products to inhibit microbial growth.

We recommend an initial use concentration of 0.1% (1,000 ppm) Giv-Gard DXN based upon the total weight of the finished water-based product in which it is used*. This concentration can be adjusted based upon the effectiveness of Giv-Gard DXN. You may experience a slight lowering of the pH of your product after the addition of Giv-Gard DXN. Should it be necessary to adjust the pH of the system, we suggest using 30 lbs. of sodium carbonate for every 100 lbs. of Giv-Gard DXN. Sodium and potassium hydroxide should be used with caution as some color formation may result. Ammonium hydroxide should not be used. A 10% neutralized solution can be prepared by following the instructions on the next page.

For the following industrial applications, Giv-Gard DXN should be used at a level of 0.1%-0.2% by weight of the system to be protected:

Emulsions (such as latex, PVA, silicone, oil, acrylic, polyethylene, PVC)
Paints (emulsions)
Coatings
Specialty industrial products (such as pigment slurries, dyestuffs, inks, thickeners/gums, lignosulfonates)
Textile chemicals and finishes (such as dye levelers, textile auxiliaries, softeners, lubricants, antistats, sizings, print pastes)
Industrial adhesives
Leather processing liquors (such as dyes and wet processing leather finishes)
Distillate fuels

* 0.1 lbs. Giv-Gard DXN per 100 lbs. of product (For emulsions weighing the same as water, this will be 1.3 fluid ounces per 10 gallons.)

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PROCEDURE FOR THE PREPARATION OF A NEUTRALIZED SOLUTION CONTAINING 10% w/w GIV-GARD DXN

Into a suitable mixing vessel (preferably one with rapid agitation) charge:

86.9 parts* Water (mw 18) and

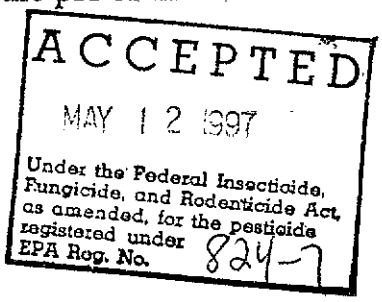
3.1 parts* Sodium Carbonate (mw 106)

After all the sodium carbonate has dissolved, slowly add

10.0 parts* GIV-GARD DXN (mw 174.2)

Agitate for 24 hours. At this time the pH of the solution should be 7.0 - 7.1.

*Parts = parts by weight



NOTES

(1) The vessel should be vented to allow for the release of carbon dioxide which forms during the neutralization.

(2) There was no temperature rise observed in preparing small batches of neutralized Giv-Gard DXN. However, caution should be observed when preparing larger quantities of solution.

(3) Further adjustment of the pH can be made after the 24-hour neutralization by introduction of additional sodium carbonate.

(4) **Do not** alter the order of addition of the reagents - e.g. do not dissolve the Giv-Gard DXN in water first and then add the sodium carbonate.

(5) The Flash Point of the neutralized solution is 100°F (TCC).

SUMMARY OF TOXICOLOGICAL DATA

Acute oral toxicity (rats)	LD_{50} (males)	2086 mg/kg
	LD_{50} (females)	3160 mg/kg
	LD_{50} (sexes combined)	2457 mg/kg
Acute dermal toxicity (rat)	LD_{50} > 2000 mg/kg	

No signs of systemic toxicity or severe dermal effects were seen throughout the study. Macroscopic postmortem evaluations revealed no significant changes.

Acute dermal toxicity (rabbits) LD_{50} > 4.0 mL/kg

Eye irritation (rabbits)

The Draize test procedure was used for both studies.

(a) The neat material produced moderate irritation; involving only the conjunctivae, which cleared on the fourth day of observation.

(b) A 1% aqueous solution did not produce any irritation or injury during the seven day observation period.

Primary skin irritation (rabbits)

Under test conditions employed, the neat material cannot be considered a primary irritant.

Irritation/Sensitization (humans)

Repeated insult patch test (Shelanski & Shelanski protocol) with a 1% solution on a panel of 52 subjects produced no irritation or sensitization reactions.

Dermal sensitization (guinea pigs)

Under conditions of this study (Maximization test; procedure of Magnusson and Kligman) DXN exhibited a strong potential to produce dermal sensitization in guinea pigs. This material also appeared to be toxic to guinea pigs, especially to females, when administered topically.

Acute inhalation toxicity (rats)

DXN was administered by inhalation as a vapor/aerosol to Sprague-Dawley CD® rats (5/sex/group) for four hours. Exposure level and particle size distribution were determined hourly by gas chromatography and Delron DCI-6 Cascade impactor, respectively. The mean analytical exposure concentrations were 4.0 and 3.1 mg/L, resulting in mortalities of 40% and 0%, respectively. The 4.0 mg/L was considered a maximum attainable exposure level based on pre-study trials. Therefore, the LC_{50} for DXN was greater than this value. Signs of toxicity during the exposure included respiratory and secretory irritation. During the 14-day post-exposure observation period, similar responses persisted during the first week after exposure and then generally abated. A transient adverse effect upon body weight was produced by treatment. Gross postmortem observations were considered unremarkable.

FOR ADDITIONAL TOXICOLOGICAL INFORMATION, CONTACT YOUR GIV-GARD DXN SALES REPRESENTATIVE

HANDLING, STORAGE AND DISPOSAL INFORMATION

Handling: Observe reasonable precautions to avoid ingestion, contact with skin and eyes, and inhalation of vapors. After handling Giv-Gard DXN, wash hands well before eating or drinking.

Storage: Giv-Gard DXN should be stored in a dry, cool, well ventilated area avoiding open flames or other sources of ignition. Keep container closed.

Disposal: Do not contaminate water, feed or food by storage or disposal of Giv-Gard DXN. Wastes resulting from the use of Giv-Gard DXN may be disposed of on site or at an approved waste disposal facility.

Disposal of any wastes must be in accordance with all current federal, state and local laws and regulations.

FOR ADDITIONAL HANDLING, STORAGE AND DISPOSAL INFORMATION CONSULT THE CURRENT MSDS FOR GIV-GARD DXN

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ADDITIONAL INFORMATION

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

This product has not been cleared under the Federal Food, Drug and Cosmetic Act for use in the manufacture of adhesives and coatings that may come in contact with food; not for use in cosmetics; not for resale.

Our recommendations for use of this product are based upon tests believed to be reliable. The use of this product being beyond the control of the manufacturer, no guarantee, expressed or implied, is made as to the effects of such or the results to be obtained if not used in accordance with directions and established safe practice. The buyer must assume all responsibility, including injury or damage, resulting from its misuse as such, or in combination with other materials.

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Date of Issue: July1995