

FUNGICIDES, BIOCIDES AND PRESERVATIVES FOR INDUSTRIAL AND AGRICULTURAL APPLICATIONS

by

Ernest W. Flick



NOYES PUBLICATIONS
Park Ridge, New Jersey, U.S.A.

Copyright © 1987 by Ernest W. Flick
No part of this book may be reproduced in any form
without permission in writing from the Publisher.
Library of Congress Catalog Card Number: 87-13742
ISBN: 0-8155-1125-6
Printed in the United States

Published in the United States of America by
Noyes Publications
Mill Road, Park Ridge, New Jersey 07656

10 9 8 7 6 5 4 3 2 1

Library of Congress Cataloging-in-Publication Data

Flick, Ernest W.
Fungicides, biocides, and preservatives for
industrial and agricultural applications.

Includes index.
1. Fungicides. 2. Chemical preservatives. I. Title.
TP248.F79F57 1987 668'.652 87-13742
ISBN 0-8155-1125-6

To the Late Dr. and Mrs. Clinton H. Bagenstose

Preface

This volume describes approximately 350 fungicides, biocides and preservatives which are currently available for industrial and agricultural usage. The book will be of value to industrial and agricultural, technical and managerial personnel involved in the specification and use of these products. It has been compiled from information received from numerous industrial companies and other organizations.

The data included represent selections from manufacturers' descriptions made at no cost to, nor influence from, the makers or distributors of these materials. All products have U.S. Environmental Protection Agency registration numbers, indicating the EPA has approved product labeling, without which the product may not be sold, legally, in the United States. It should be noted that all products cannot necessarily be sold in every state in the U.S. Some states have certain restrictions on formulations permitted for use. It is the responsibility of the user to check with the manufacturer as to whether any of these restrictions applies in a particular geographic location.

Only the most recent information has been included. It is believed that all of the products listed here are currently available, which will be of utmost interest to readers concerned with product discontinuances.

Products are presented by company, and the companies are listed alphabetically. The table of contents is organized in such a way as to serve as a subject index to the book. Also included are a Trade Name Index and a Chemical Name Index, for easy and rapid location of products by the reader. In addition, another section, which will be useful, contains the Suppliers' Addresses. It can be found immediately following the Product Information section.

The book lists the following product information, as available, in the manufacturer's own words:

- (1) Company name and product category.
- (2) Trade name and product numbers.
- (3) Product Description: a description of the product, as presented by the supplier.
- (4) EPA registration number.

This book should prove to be valuable as a guide for the industrial and agricultural communities.

My fullest appreciation is expressed to the companies and organizations who supplied the data included in this book.

Newburyport, Massachusetts
July 1987

Ernest W. Flick

NOTICE

To the best of our knowledge the information in this publication is accurate; however the Publisher does not assume any responsibility for the accuracy or completeness of, or consequences arising from, such information. This industrial guide does not purport to contain detailed user instructions, and by its range and scope could not possibly do so. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the Publisher.

Fungicide, biocide and preservative raw materials can be toxic, and therefore due caution should always be exercised in the use of these hazardous materials. Final determination of the suitability of any information or product for use contemplated by any user, and the manner of that use, is the sole responsibility of the user. We strongly recommend that users seek and adhere to a manufacturer's or supplier's current instructions for handling each material they use.

The author and Publisher have used their best efforts to include only fungicides approved by the U.S. Environmental Protection Agency. However, prior to use of a specific fungicide, readers are cautioned to verify current approval status.

Contents

<i>Preface</i>	vii
<i>Notice</i>	viii
<i>Product Information Abbott - Buckman Laboratories</i>	2
Abbott Laboratories	2
AMICAL Flowable Preservative	2
AMICAL 48 Preservative	3
AMICAL 50 Preservative for Latex Paints	4
Agtrol Chemical Products	5
Agricultural Fungicides	5
CHAMPION Wettable Powder	5
COPZIN Wettable Powder	5
CHAMPION Flowable	5
Alco Chemical Corp.	6
AQUATREAT Microbiocides	6
AQUATREAT DNM-30	6
AQUATREAT DNM-360	6
AQUATREAT DNM-9	6
AQUATREAT SDM	6
AQUATREAT KM	6
American Cyanamid Company	7
CYPREX 65-W Fruit Fungicide	7
Angus Chemical Company	8
BIOBAN CS-1135 Preservative	8
BIOBAN CT In-Can Paint Preservative	9

x Contents

BIOBAN GK	10
BIOBAN N-95 Preservative for Metal-Working Fluids	11
BIOBAN P-1487 Broad-Spectrum Antimicrobial Agent	12
BODOXIN	13
FUELSAVER Antimicrobial Agent	14
S.S.T. SUMP SAVER TABLETS	15
TRIS NITRO	16
Bedford Chemical Division	17
MICRO-CHEK Antimicrobials	17
MICRO-CHEK 11	17
MICRO-CHEK 11D	17
MICRO-CHEK 11 DIDP	17
MICRO-CHEK 11 S-711	17
MICRO-CHEK 11 S-160	17
MICRO-CHEK 11 IPA	17
MICRO-CHEK 11 T	17
Beecham Home Improvement Products, Inc.	18
Water Based WOODLIFE: 4-1 Concentrate & Ready-to-Use ...	18
WOODLIFE-F Water Repellent Preservative for Wood	19
Betz Energy Chemicals, Inc.	20
BETZ ENCHEM Biocides	20
BETZ ENCHEM 41-J1 Biocide	20
BETZ ENCHEM 41-J2 Biocide	21
BETZ ENCHEM 41-J3 Biocide	22
BETZ ENCHEM 41-J4 Biocide	23
BETZ ENCHEM 41-J5 Biocide	24
BETZ ENCHEM 41-J6 Biocide	25
BETZ ENCHEM 41-J7 Biocide	26
Betz Laboratories, Inc.	27
BETZ ENTEC 343 Slime Control Agent	27

BETZ Slimicides	28
BETZ Slimicide C-31	28
BETZ Slimicide C-58P	29
BETZ Slimicide C-63P	30
BETZ Slimicide C-70	31
BETZ Slimicide J-12	32
BETZ Slimicide 508	33
Buckman Laboratories	34
BUSAN 40	34
BUSAN 90	35
<i>Product Information Calgon Corp. - Dupont</i>	36
Calgon Corp.	36
Microbiocides	36
H-130 Microbiocide	36
H-204 Microbiocide	37
H-212 Microbiocide	38
H-300 Microbiocide	39
H-380 Microbiocide	40
H-430 Microbiocide	41
H-450 Microbiocide	42
H-510 Microbiocide	43
H-900 Microbiocide	44
H-900G Microbiocide	45
BIOCHEK 240	46
MERBAC-35	47
METASOL D3T	48
METASOL D3T-A	49
TEKTAMER 38	50
TEKTAMER 38 A.D.	51
TEKTAMER 38 LV	52

xii Contents

TK-100	53
TK-100 DISPERSION W	54
California Products Corporation	55
Wood Preservatives	55
STORM STAIN Linseed Oil Stain & Wood Preservative	55
STORM STAIN Penetrating Wood Preservative	56
STORM STAIN Underground Wood Preservative	56
Chapman Chemical Co.	57
CUNAPSOL-5 Water-Borne Copper Naphthenate	57
MITROL G-ST Antimicrobial Agent	58
MITROL PQ-8 for Control of Sapstain and Mold on Wood	59
MITROL PQ-15 RTU	60
MITROL PO-56 Antimicrobial-Preservative	61
MITROL PQ-57	62
WOODGUARD	63
W.A. Cleary Chemical Corp.	64
Fungicides	64
3336 (TM) Turf and Ornamental Fungicide	64
3336-F Systemic Turf and Ornamental Fungicide	65
BROMOSAN	66
BROMOSAN-F	67
CADDY	68
CLEARY'S CAD-TRETE GRANULAR TURF FUNGICIDE ...	69
CLEARY'S GRANULAR TURF FUNGICIDE	70
PMAS	71
SPOTRETE-F	72
SPOTRETE 75W	73
Cosan Chemical Corporation	74
COSAN 91	74
COSAN 101	75

COSAN 145	76
COSAN 158	77
COSAN 265	78
COSAN 635-W	79
COSAN JTA-20	80
COSAN JTA-46	81
COSAN P	82
COSAN PCMC	83
COSAN PMA-30	84
COSAN PMA-100	85
COSAN PMO-30	86
COSAN S	87
COTIN 234	88
COTIN 300	89
Dexol Industries	90
DEXOL ACTI-DIONE PM Rose Fungicide	90
DEXOL BENOMYL Systemic Fungicide	91
DEXOL Bordeaux Mixture	92
DEXOL Maneb Garden Fungicide	93
DEXOL THIRAM PLUS Lawn Fungicide Contains ACTI- DIONE	94
DEXOL ZINEB Garden Fungicide	95
Diamond Shamrock Chemicals Co.	96
NOPCOCIDE Fungicides	96
NOPCOCIDE N-40-D	96
NOPCOCIDE N-96	96
NOPCOCIDE N-96-S	97
Dow Chemical U.S.A.	98
DBNPA 2,2-Dibromo-3-Nitrilopropionamide	98
DOW Antimicrobial 7287	98
DOW Antimicrobial 8536	98

xiv Contents

DOWICIDE 1 Antimicrobial	99
DOWICIDE A Antimicrobial	100
DOWICIL 75 Preservative	101
Dupont	102
Agricultural Products	102
BENLATE Fungicide Wettable Powder	102
BENLATE PNW Fungicide Wettable Powder	102
MANZATE 200 Fungicide Wettable Powder	102
MANZATE 200 Flowable Fungicide Liquid Suspension	103
TERSAN 1991 Fungicide Wettable Powder	103
TERSAN LSR Fungicide Wettable Powder	103
<i>Product Information Eastern Company - Koppers Co.</i>	104
Eastern Color & Chemical Company	104
ECCO MP-170-CONC400	104
ECCO MP-400	105
ECCO MP-2004	106
ECCOCIDE CW CONC	107
FMC Corporation	108
FUNGINEX 1.6 EC Fungicide	108
Great Lakes Chemical Corp.	109
BROMICIDE Microbiocide	109
Griffin Corp.	110
Fungicides	110
BASICOP	110
CAPTEC 4L	111
DU-TER Flowable	112
K-COP	113
KOCIDE 20/20	114
KOCIDE 101	115
KOCIDE 404S	116

KOCIDE 606	117
KOCIDE SD	118
MANEX	119
PRO-TEX	120
SUPER SIX	121
SUPER TIN 4L	122
Gustafson, Inc.	123
Grain and Seed Treating Chemicals	123
GUSTAFSON APRON-FL Seed Treatment Fungicide	123
GUSTAFSON APRON 25W	123
GUSTAFSON BOTRAN-30C	124
GUSTAFSON Captan-DCNA 60-20	124
GUSTAFSON Captan 400	125
GUSTAFSON Captan 400-D	125
GUSTAFSON Captan Methoxychlor 75-5	125
GUSTAFSON Captan 75%	126
GUSTAFSON Captan 300	126
GUSTAFSON Captan 30-DD	126
KE Chloroneb 65W Fungicide	127
GUSTAFSON EVERSIELD C	127
GUSTAFSON EVERSIELD II	127
GUSTAFSON FLO-PRO D Seed Protectant	128
GUSTAFSON FLO-PRO-IMZ	128
GUSTAFSON 4-Way	128
GUSTAFSON Flowable Lindane 40%	129
GUSTAFSON Lindane 30C Flowable	129
GUSTAFSON LORSBAN 30 Flowable	129
Flowable (Water Dispersible Suspension) MERTECT LSP Fungicide Wheat Seed Treatment	129
GUSTAFSON Methoxychlor 300	130
GUSTAFSON PRO-GRO	130

GUSTAFSON RTU-PCNB	130
GUSTAFSON RTU-PCNB/LINDANE	131
GUSTAFSON TERRA-COAT L-21N	131
GUSTAFSON TERRA-COAT L-205N	131
GUSTAFSON TERRA-COAT LT-2N	132
GUSTAFSON TERRACLOR SUPER-X 20-5 Dust with Graphite	132
GUSTAFSON TERRACLOR SUPER-X with MOLY	132
GUSTAFSON Thiram-30 Fungicide	133
GUSTAFSON Thiram 50WP Dyed	133
GUSTAFSON 42-S	133
GUSTAFSON TOPS-2.5D	133
VITAVAX Fungicide	134
GUSTAFSON VITAVAX CAPTAN 20-20 Seed Protectant ...	134
GUSTAFSON VITAVAX-HB POUR-ON Flowable Fungicide	134
GUSTAFSON VITAVAX-Maneb-Lindane	135
GUSTAFSON VITAVAX-PCNB	135
GUSTAFSON VITAVAX-34	135
VITAVAX-30C Concentrate	136
VITAVAX-200	136
Hopkins Agricultural Chemical Co.	137
DICHLONE Wettable Powder Fungicide	137
Kincaid Enterprises, Inc.	138
CHLORONEB Fungicide	138
Fungicides	139
TERRANEB SP Turf Fungicide	139
CHLORONEB 65W Fungicide	139
Koppers Co., Inc.	140
COPPER TREAT 110 Ready-to-Use Wood Preservative	140
COPPER TREAT 120 Ready-to-Use Wood Preservative	141

Sapstein Control Chemical NP-1	142
TIMBERTREAT 625 Insecticide	143
TRIBUCIDE P-75 Concentrate Water Repellent Wood Preservative	144
TRIBUCIDE P-75 Ready to Use Water Repellent Wood Preservative	145
WOLMAN Treat OO Ready-to-Use Wood Preservative for Field Treatment	146
WOODTREAT C81 Ready to Use Water Repellent Fungicide	147
WOODTREAT MB Ready-to-Use Water Repellent Wood Preservative	148
WOODTREAT WB Concentrate Water Repellent Wood Preservative	149
<i>Product Information Leffingwell - Nuodex, Inc.</i>	150
Leffingwell	150
NUTRA-SPRAY COPPER Fungicides	150
NUTRA-SPRAY COPPER BORDEAUX 22	150
NUTRA-SPRAY BASIC COPPER CARBONATE	150
M&T Chemicals, Inc.	151
BIOMET TBTF (Tributyltin Fluoride) Anti-Foulant for Marine Paints	151
BIOMET TBTO Antifoulant Bis (tributyltin) Oxide for Shipbottom Paints	152
BIOMET 14 Antimicrobial Compound for Protection of PVC Systems	153
BIOMET 430/45 Antifoulant for Marine Paints	154
MAAG Agrochemicals, Inc.	155
NYTEK 10	155
NYTEK 10WP	156
NYTEK 645 Penetrant Sealer	157

NYTEK WD	158
Mallinckrodt, Inc.	159
Products for Horticulture	159
BANROT	159
MILBAN Brand Mildew Fungicide	160
ORNALIN Contact Fungicide 50% Wettable Powder	161
TRUBAN 5-G Fungicide	162
TRUBAN Flowable	163
TRUBAN Fungicide 25% Emulsifiable Concentrate	164
TRUBAN Fungicide 30% Wettable Powder	165
ZYBAN	166
Turf Products	167
CADMINATE	167
CALO-CLOR	168
CALO-GRAN	169
DUOSAN	170
FUNGO 50	171
KOBAN 1.3G	172
KOBAN 30	173
KOBAN Flowable	174
KROMAD	175
THIRAMAD	176
VORLAN	177
Miller Chemical & Fertilizer Corp.	178
Fungicides	178
BENOMYL 50W Systemic Fungicide	178
Lime Sulfur Solution	178
MANEB Garden Fungicide	178
Mobay Chemical Corp.	179
BAYLETON Fungicide	179

Mooney Chemicals, Inc.	180
M-GARD Registered Wood Preservatives	180
M-GARD W110	180
M-GARD S120	180
M-GARD W150	180
M-GARD S150	180
M-GARD W550	181
Mooney M-GARD S520	182
Registered Fungicides	183
8% COPPER NAP-ALL	183
6% COPPER NAP-ALL	183
8% ZINC NAP-ALL	183
Morton Thiokol, Inc.	184
CUNILATE Fungicides	184
CUNILATE 2419	184
CUNILATE 2174-NO	184
CUNILATE 2419-75	184
CUNIPHEN Fungistatic Treatment for Textiles	185
CUNIPHEN 2713	185
CUNIPHEN 2721	185
CUNIPHEN 2721-C	185
CUNIPHEN 2762	185
CUNIPHEN 2778-I	186
DUROTEX Antimicrobials	187
DUROTEX 7599	187
DUROTEX 7603	187
DUROTEX 7604	187
DUOTEX GPM	187
SOCCI Fungistatic Treatments	188
SOCCI 3500 Fungistatic Treatment for Industrial Textiles Applications	188

SOCCI 3500-WP Fungistatic/Water Repellent Treatment for Industrial Textile Applications	188
SOCCI 30 Fungistatic Treatment for Rope and Cordage	188
VINYZENE Antimicrobials	189
BP-5-2	189
BP-5-2DIDP	189
BP-5-2DOP	189
BP-5-2PG	189
BP-5-2S-160	189
BP-5-2U	189
VINYZENE Antimicrobials: Antimicrobial Additives for Plastics	190
BP-5	190
BP-5 DIDP	190
BP-5 DOP	190
BP-5 RG	190
BP-5 S-160	190
BP-5-2 MEK	191
BP-5-2 MS	191
VINYZENE Antimicrobials: Bacteriostatic and Fungistatic Additives for Plastic Compounds	192
BP-505	192
BP-505 DIDP	192
BP-505 DOP	192
BP-505 PG	192
BP-505 S160	192
VINYZENE BP-5SIL3 Antimicrobial Additive for Plastics	193
VINYZENE SB-1 Antimicrobial Additive for Plastics	194
VINYZENE SB-1 EAA Antimicrobial Additive for Plastics	195
VINYZENE SB-1 ELV Antimicrobial Additive for Plastics	196
VINYZENE SB-1 NY Antimicrobial Additive for Plastics	197

VINYZENE SB-1 PR Antimicrobial Additive for Plastics	198
VINYZENE SB-1 PS Antimicrobial Additive for Plastics	199
Nuodex, Inc.	200
Antimicrobials	200
FUNGITROL 11	200
FUNGITROL 11-50 Dispersion	201
FUNGITROL TINOX	202
FUNGITROL Zinc 8% Fungicide	203
FUNGITROL Zinc 8% W.D. Fungicide	204
NUOCIDE 404-D	205
NUOCIDE 960	206
NUODEX 84	207
NUODEX 100 V.T. Microbiocide	208
NUODEX Copper 8%	209
NUODEX PMA 18	210
NUOPHENE	211
NUOSEPT 65 Preservative	212
NUOSEPT 95 Preservative	213
PMA 60	214
QUINDEX	215
QUINDEX Emulsion Base	216
QUINDEX N-10 GDP Fungicide	217
QUINDEX N-10 PS Fungicide	218
QUINDEX N-10 SS Fungicide	219
QUINDEX N-10 WR Fungicide	220
SUPER AD-IT Fungicide	221
<i>Product Information O'Brien - Vineland Chemical</i>	222
O'Brien Industries, Inc.	222
O'B ALGE 670	222
Olin Chemicals	223

SODIUM OMADINE 40% Aqueous Solution Industrial Microbiostat for Industrial and Formulating Use Only	223
ZINC OMADINE 48% Aqueous Dispersion, Industrial Grade ...	224
ZINC OMADINE Powder Industrial Microbiostat for Industrial and Formulating Use Only	225
TRIADINE 10 Antimicrobial Agent	226
Pennwalt Corporation	227
Fungicides	227
MANEB	227
PENNCOZEB	227
TOPSIN M 4.5F	228
TOPSIN M	228
ZIRAM	229
ZIRAM F-4	229
Rhone-Poulenc, Inc.	230
Fungicides	230
ALIETTE Fungicide	230
ROVRAL Fungicide	230
Rohm and Haas	231
KATHON Preservatives	231
KATHON LX	231
KATHON LX 1.5%	231
KATHON MWX	232
KATHON WT	233
KATHON WT 1.5%	233
KATHON 886 MW	234
KATHON 886 MW 1.5%	234
The O.M. Scott & Sons Co.	235
SCOTTS PROTURF	235
14-3-3	235
23-3-3	235

24-5-3	235
28-0-12	236
Broad Spectrum Fungicide	236
Fluid Fungicide	236
Fluid Fungicide II	237
Fungicide II	237
Fungicide VI	237
Fungicide 7	238
Pythium Control	238
Systemic Fungicide	238
Standard Tar Products Co., Inc.	239
ORGANICLEAR Wood Preservatives	239
ORGANICLEAR TM-2	239
ORGANICLEAR WR-2	239
ORGANICLEAR TM-5	239
ORGANICLEAR WR-5	239
ORGANICLEAR	239
Stauffer Chemical Company	240
FOLPET (PHALTAN) 50-WP	240
Tennessee Chemical Company	241
TENN-COP 5E	241
Tri-Basic Copper Sulfate	242
Troy Chemical Corp.	243
TROYSAN AMO (Troysan Anti-Mildew O)	243
TROYSAN CMP (TROYSAN CMP ACETATE)	244
TROYSAN PMA-10-SEP	245
TROYSAN PMA-30	246
TROYSAN PMDS-10	247
TROYSAN POLYPHASE AF1	248
TROYSAN POLYPHASE P100	249

xxiv Contents

TROYSAN 142	250
TROYSAN 174	251
TROYSAN 192	252
Union Carbide Corp.	253
AQUCAR Water Treatment Microbiocides	253
AQUCAR 515	253
AQUCAR 545	253
UCARCIDE Antimicrobials	254
UCARCIDE 225 Antimicrobial	254
UCARCIDE 250 Antimicrobial	254
UCARCIDE 150 Antimicrobial	255
UCARCIDE Antimicrobial 750 for Pigment and Filler Slurries	256
UCONEX Antimicrobial 345 for Metalworking Fluids	257
Uniroyal Chemical Co., Inc.	258
Fungicides	258
PLANTVAX-75W	258
TERRACLOR 2 Lb. Emulsifiable Soil Fungicide	258
TERRACLOR 10% Granular Soil Fungicide	258
TERRACLOR 75% Wettable Powder Soil Fungicide	259
TURFCIDE 10% Granular Turf & Ornamental Fungicide	259
TURFCIDE 2 Lb. Emulsifiable Turf & Ornamental Fungicides	259
TERRACLOR Super X Granular Soil Fungicide with Thimet Systemic Insecticide	260
TERRAZOLE 5% Granular Fungicide	260
TERRAZOLE 25% Emulsifiable Turf & Ornamental Fungicide	260
TERRACLOR SUPER X Emulsifiable Soil Fungicide	261
TERRACLOR SUPER X Granular Soil Fungicide for Cotton	261

TERRACLOR SUPER X Granular Soil Fungicide with Disyston Systemic Insecticide	261
TERRAZOLE 35% Granular Turf & Ornamental Fungicide ..	262
TERRAZOLE 4 Lb . Emulsifiable Fungicide	262
U.S. Professional Laboratories	263
GROTAN Broad Spectrum Bactericide and Fungicide	263
R.T. Vanderbilt Co., Inc.	264
Preservatives	264
VANCIDE 51	264
VANCIDE 51Z	265
VANCIDE 51Z Dispersion	266
VANCIDE MZ-96	267
VANCIDE TH	268
VANCIDE 89	269
Vikon Chemical Co., Inc.	270
VIKOL #AF-25	270
VIKOL RQ	271
Vineland Chemical Co.	272
Microbiocides	272
SLIMICIDE V-10	272
VINELAND MBT 10%	272
Suppliers' Addresses	274
Chemical Name Index	277
Trade Name Index	284

2 Fungicides, Biocides and Preservatives

Product Information

ABBOTT LABORATORIES: AMICAL Flowable Preservative:

EPA Reg. No. 275-72

Organic Chemical Antimicrobial Agent

AMICAL Flowable is a water based liquid formulation of AMICAL (diiodomethyl-p-tolyl sulfone). As such, AMICAL Flowable provides the same mildew and algacidal protection of polymeric systems as AMICAL 48 and AMICAL 50 with superior dispersing characteristics when used in an aqueous system. AMICAL Flowable contains 40% active ingredient by weight and efficacy testing indicates enhanced mildewcidal protection when compared to AMICAL 48, and water is used as the carrier.

Physical Properties

AMICAL Flowable is one of a series of AMICAL formulations offered exclusively by Abbott Laboratories. Chemically, AMICAL Flowable is diiodomethyl-p-tolylsulfone.

AMICAL Flowable is stable through a pH range of 3.0 to 10.5.

Appearance:	Light gray finely divided suspension
Boiling Point:	100C
Freezing Point:	0C
pH:	7.0-8.5
Viscosity:	600 - 1000 cps @ 25C
Specific Gravity:	1.32 -1.33
Weight per Gallon:	11.05 lbs.
Assay*	Min 40%

* Active ingredient

Microbiological Properties

AMICAL Flowable provides a broad spectrum of antimicrobial activity. AMICAL Flowable is especially effective against major mildew-causing organisms.

AMICAL Protects Latex Paints Against Mildew Better Than Any Mercurials Tested

Fungicidal Activity in Chrome-Tanned Cattle Hides

AMICAL is an established antifungal agent for use in protecting chrome or vegetable tanned leather from mold and mildew during in-tannery wet processing and for protecting wet-blue during long storage and long transportation times, as encountered in the exportation of wet-blue.

ABBOTT LABORATORIES: AMICAL 48 Preservative:

EPA Reg. No. 275-21

Organic Chemical Antimicrobial Agent

AMICAL 48 is a tan powder consisting of not less than 95% diiodomethyl-p-tolyl sulfone. AMICAL 48 provides mildew and algicidal protection of polymeric systems.

Physical Properties

AMICAL 48 is one of a series of AMICAL formulations offered exclusively by Abbott Laboratories. AMICAL 48 is diiodomethyl-p-tolylsulfone. AMICAL 48 is stable through a pH range of 3.0 to 10.5.

Appearance:	Tannish finely divided powder
Melting Point:	157 C
pH:	7.0-8.5
Assay:	Min 95%

Microbiological Properties

AMICAL 48 provides a broad spectrum of antimicrobial activity. AMICAL 48 is especially effective against major mildew-causing organisms.

AMICAL Protects Latex Paints Against Mildew Better Than Any Mercurials Tested

Wood Preservation

4 Fungicides, Biocides and Preservatives

ABBOTT LABORATORIES: AMICAL 50 Preservative for Latex Paints:

EPA Reg. No. 275-27

New Organic Chemical Antimicrobial Agent
Does Not Tend to Cause Yellowing

AMICAL 50 is one of a series of new highly effective organic chemical antimicrobial agents. It provides mildewcide activity superior to that of organomercurials, and also provides package preservative action when used at higher mildewcide levels.

AMICAL 50 contains the same active ingredients as AMICAL 48. However, AMICAL 50 also contains effective color suppressants.

AMICAL 48 has been reported to cause a transient yellow color in some paint systems.

AMICAL 50 contains not less than 75% diiodomethyl p-tolyl sulfone plus 20 percent color suppressants. The color suppressants have no harmful effects on paint stability in the can nor on the applied coating. They function only to inhibit the development of discoloration of the paint film.

Comparative laboratory and field exposure testing show the following advantages for AMICAL 50 preservative.

- AMICAL 50 mildewcide activity is superior to mercurials in latex paint systems.
- AMICAL 50 mildew protection is comparable or superior to that of competitive organic chemical mildewcides.
- AMICAL 50 also acts as a package preservative.
- AMICAL 50 is effective with or without zinc oxide.
- AMICAL 50 does not tend to cause yellowing.
- AMICAL 50 is easy to handle.

Physical Properties

AMICAL 50 is one of a series of newly developed organic chemicals offered exclusively by Abbott Laboratories. The active ingredient in AMICAL 50 is diiodomethyl p-tolyl sulfone. Color suppressants are also present.

Appearance	Fine Tan Powder
Specific Gravity	1.96 g/cc
Assay	
Active Ingredient	Min. 75%
Inert Ingredients	Max. 25%

Microbiological Properties

AMICAL 50 provides a broad spectrum of antimicrobial activity, and is especially effective against major paint mildew-causing organisms.

AGTROL CHEMICAL PRODUCTS: Agricultural Fungicides:

Product Name:

CHAMPION Wettable Powder

Active Ingredient	
Cupric Hydroxide	77%
Inert Ingredients	23%
Total	100%
(Metallic Copper Equivalent....50%)	

EPA Reg. No. 55146-1
 EPA Est. No. 35896-SC-1

COPZIN Wettable Powder
 Agricultural Fungicide with Nutritional Zinc

Active Ingredient:	
Basic Copper Sulfate (24% Metallic Copper)	45.2%
Inert Ingredients	
(Including 24% Elemental Zinc)	54.8%
Total	100.0%

EPA Reg. No. 55146-14
 EPA Est. No.

CHAMPION FLOWABLE

Active Ingredient	
Cupric Hydroxide	37.5%
Inert Ingredients	62.5%
Total	100.0%
Contains 4.5 Lbs. Cupric Hydroxide per Gal. (Metallic Copper Equivalent....24.4%)	

EPA Reg. No. 55146-2
 EPA Est. No.

6 Fungicides, Biocides and Preservatives

ALCO CHEMICAL CORP.: AQUATREAT Microbiocides:

- are very safe for operators and in the environment. They contain no halogens or aldehydes and degrade quickly for discharge.
- offer very cost-effective control of a wide range of anaerobic and aerobic bacteria, fungi and algae.
- have excellent storage stability and in application are non-foaming and non-corrosive.
- are compatible with most other treatment chemicals, including oxygen scavengers, and are effective in a reducing atmosphere.
- are approved for use in California.
- are available in winterized formulations.

Registered Microbiocides

Standard Formulations

Since the introduction of AQUATREAT DNM-30, ALCO has developed and registered several microbiocides in addition to DNM-30 (30% active). AQUATREAT DNM-360 (36% active) and AQUATREAT DNM-9 (9% active) have been made available for the convenience of the formulator. Additionally, ALCO has registered other single dithiocarbamate microbiocides where their specific activities are needed.

AQUATREAT DNM-30	30 per cent mixed NABAM/DIBAM equal portions
AQUATREAT DNM-360	36 per cent mixed NABAM/DIBAM equal portions
AQUATREAT DNM-9	9 per cent mixed NABAM/DIBAM equal portions
AQUATREAT SDM	40 per cent mixed Sodium Dimethyldithiocarbamate
AQUATREAT KM	50 per cent Potassium Dimethyldithiocarbamate

Registrations

Water Treatment

Paper

Sugar

Petroleum

AQUATREAT DNM-30:	EPA Reg. No.: 31910-1
AQUATREAT DNM-30:	EPA Reg. No.: 31910-2
AQUATREAT DNM-9:	EPA Reg. No.: 31910-11
AQUATREAT DNM-360:	EPA Reg. No.: 31910-12
AQUATREAT SDM:	EPA Reg. No.: 31910-6
AQUATREAT KM:	EPA Reg. No.: 31910-5

AMERICAN CYANAMID COMPANY: CYPREX 65-W Fruit Fungicide:

Active Ingredient:

Dodine (n-dodecylguanidine acetate)	65.0%
Inert Ingredients	35.0%

EPA Reg. No. 241-51-AA

For control of certain fungus diseases of apples, cherries, peaches, pears, and pecans.

8 Fungicides, Biocides and Preservatives

ANGUS CHEMICAL COMPANY: BIOBAN CS-1135 Preservative:

EPA Reg. No. 48301-8

BIOBAN CS-1135 preservative is an aqueous solution containing the following minimum concentrations of active ingredients:

4,4,-dimethyloxazolidine	74.7% by wt
3,4,4-trimethyloxazolidine	2.5% by wt

It contains no metallic compounds nor any organic derivatives of sulfur, boron, phosphorus, or halogens.

The advantages of using BIOBAN CS-1135 are:

- Antimicrobial activity against a broad spectrum of microorganisms.
- Effective over a wide pH range including both alkaline and acid pH values.
- Alkaline buffering capability to prevent pH drift.
- Aids in maintaining optimum viscosity of emulsion formulations.
- Minimal discoloration of most formulations.
- Low freezing point.
- Excellent thermal stability.

In addition to its antimicrobial activity, the amine functionality in BIOBAN CS-1135 provides:

- Corrosion inhibition in many systems.
- Emulsifying capability when used with a fatty acid.

Physical Properties of BIOBAN CS-1135

Neutral equivalent as a base	128-133.5
Color, APHA	100 (max.)
Flash point, Tag closed cup	120F
Freezing point	below -20C
Specific gravity at 25/25C	0.98-0.99
Viscosity at 25C	~ 7.5 cp
pH	10.5-11.5
Weight per U.S. gallon	8.2 lb

ANGUS CHEMICAL COMPANY: BIOBAN CT In-Can Paint Preservative:

EPA Reg. No. 48301-11

BIOBAN CT is an economical preservative for the prevention of spoilage of latex paints due to microbial contamination during production. Another important benefit is the complete lack of objectionable odor of BIOBAN CT.

Typical Physical Properties

Crystallization point (approx.)	55F
Specific gravity at 25/25C	1.222

Specifications

2-Hydroxymethyl-2-nitro-1,3 propanediol, % by wt.	50 (min.)
Free formaldehyde, % by wt.	1 (max.)
pH, as is	2.0-4.5
Color, Gardner	5.0 (max.)

10 Fungicides, Biocides and Preservatives

ANGUS CHEMICAL COMPANY: BIOBAN GK:

Brand of hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine

EPA Reg. No.: 48301-14

BIOBAN GK is a 78.5% solution of hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine in water. It is widely used as an antimicrobial agent in metalworking fluids and in the preservation of latex paints and emulsions.

BIOBAN GK is effective against both Gram-positive and Gram-negative bacteria. At higher concentrations, it is also effective against yeast and molds. Its activity is not affected by either the hardness of the water or the presence of nonionic surfactants in the fluid.

Typical Properties

Vapor Pressure, at 20C	3.3 mmHg
at 40C	13.4 mmHg
Flash Point, Pensky Martens	167F
Freezing point	-10F
Specific gravity 25/25C	1.16
Pounds per gallon at 77F	9.65
Viscosity, Brookfield	300 cp
pH, as supplied	10.0-11.0

Uses

Metalworking Fluid Preservation
Latex Emulsion Preservation

ANGUS CHEMICAL COMPANY: BIOBAN N-95 Preservative for Metal-Working Fluids:

EPA Reg. No. 1100-82-48301

BIOBAN N-95 Preservative is a 50% aqueous solution of non-metallic organic compounds which is effective for the prevention of deterioration and spoilage of metalworking fluids.

Composition

Active Ingredients	% by wt.
5-Hydroxymethoxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane	24.5
5-Hydroxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane	17.7
5-Hydroxypoly[methyleneoxy(74% C2, 21% C3, 4% C4, 1% C5)] methyl-1-aza-3,7-dioxabicyclo(3.3.0)octane	7.8
Total Active Ingredients	50.0
Inert Ingredients	
Water	50.0

Typical Physical Properties

Appearance	Clear, pale yellow liquid
Odor	Mild, characteristic
Color (APHA)	250 maximum
Viscosity (25C)	3.6 centistokes
Specific gravity (25/25C)	1.137
Weight per gallon	9.5 lb
Refractive index (25C)	1.404
pH	5-7.5
Flash point (Tag Closed Cup,F)	>200

12 Fungicides, Biocides and Preservatives

ANGUS CHEMICAL COMPANY: BIOBAN P-1487 Broad-Spectrum Anti-microbial Agent:

EPA Reg. No. 48301-7

BIOBAN P-1487 is a potent agent to inhibit bacterial growth. It is recommended for those situations requiring oil solubility, yet it also is effective in aqueous systems. BIOBAN P-1487 consists of a mixture of two active chemicals:

- (I) 4-(2-nitrobutyl)morpholine
CAS Registry Number 2224-44-4
- (II) 4,4'-(2-ethyl-2-nitrotrimethylene) dimorpholine
CAS Registry Number 1854-23-5

Compound I is normally a liquid; pure compound II is a solid melting above ambient temperature. The ratio of the two components is chosen so that BIOBAN P-1487 will normally remain a liquid at temperatures above 0C. BIOBAN P-1487 is only moderately soluble in water; the saturated solution is slightly alkaline. BIOBAN P-1487 is soluble in most organic solvents, including aliphatic hydrocarbons.

Active Ingredients

4-(2-Nitrobutyl)morpholine	70% by wt
4,4'-(2-Ethyl-2-nitrotrimethylene)dimorpholine	20% by wt
Inert Ingredients	10% by wt
Total	100%

EPA Reg. No. 48301-7AA
EPA Est. No. 48301-WG-1

ANGUS CHEMICAL COMPANY: BODOXIN:

(E.P.A. Reg. No. 48301-16)

- Metalworking fluids.
- Powerful antibacterial and antifungal activity.
- Useable in concentrates and tankside.
- Long lasting.
- Years of proven experience.

Physical State: liquid

Specific Gravity (25/25C): 1.24

Flash Point(closed cup): 140F

pH: ~7.0 (as supplied)

14 Fungicides, Biocides and Preservatives

ANGUS CHEMICAL COMPANY: FUELSAVER Antimicrobial Agent:

Fuel Preservation Performance

FUELSAVER Antimicrobial Agent (EPA Reg. No. 48301-7) is an excellent preservative for the prevention of microbial growth in hydrocarbons. Studies have shown that at recommended levels it is:

- effective against those bacteria, fungi, and yeasts found in contaminated fuels.
- fully soluble in fuels and hydrocarbons.
- active even in the presence of large quantities of water.

Also, when tested at levels of up to 1000 ppm in No. 2 diesel fuel, no deleterious effects on engine performance or emissions were noted. That is, engine rpms, power output, and torque remained unchanged, and no increase in the amount of pollutants emitted were observed.

Conclusions:

FUELSAVER will control microbial growth effectively at levels as low as 250 ppm in the fuel. This ability to provide control is unaffected by the presence of water in the system. In fact FUELSAVER is highly effective for hydrocarbons intentionally stored over water. Protection can be obtained by addition of FUELSAVER to the fuel or by direct addition to the water phase.

FUELSAVER is a potent agent to inhibit microbial growth. It is recommended for those situations requiring oil solubility, yet it also is effective in aqueous systems. FUELSAVER consists of a mixture of two active chemicals.

Compound I, 4-(2-nitrobutyl)morpholine (CAS Registry Number 2224-44-4), is normally a liquid; pure compound II, 4,4'-(2-ethyl-2-nitrotrimethylene)dimorpholine (CAS Registry Number 1854-23-5), is a solid, melting above ambient temperature. The ratio of the two components is chosen so that FUELSAVER will normally remain a liquid at temperatures above 0C. FUELSAVER is only moderately soluble in water; the saturated solution is slightly alkaline. FUELSAVER is soluble in most organic solvents, including aliphatic hydrocarbons.

Active Ingredients:

4-(2-Nitrobutyl)morpholine	70% by wt
4,4'-(2-Ethyl-2-nitromethylene)dimorpholine	20% by wt

Inert Ingredients:

Total	10% by wt
-------	-----------

Total	100%
-------	------

EPA Reg. No. 48301-7AA

ANGUS CHEMICAL COMPANY: S.S.T. SUMP SAVER TABLETS:

Bacteriostat for Water-Soluble Metalworking Fluids
EPA Registry No. 48301-10AA

S.S.T. Sump Saver Tablets are a convenient method for extending the useful life of metalworking fluids. They contain as active ingredient the well-known antimicrobial agent TRIS NITRO brand of tris(hydroxymethyl)-nitromethane* formulated into a compact wafer form for ease of handling.

Each S.S.T. Sump Saver Tablet weighs one ounce, sufficient for one week's treatment of 25 gallons of normal metalworking fluid. For extremely fouled systems, use two tablets weekly per 25 gallons of fluid.

The use of S.S.T. Sump Saver Tablets results in a significant savings in time and money because fluid life can be greatly extended. Not only does this save the cost of replacement fluid but also provides significant savings in terms of less machine downtime and lower cost of spent fluid disposal. Additionally, a cleaner fluid means improved machine productivity and extended tool life.

- The CAS Registry No. is 126-11-4.

16 Fungicides, Biocides and Preservatives

ANGUS CHEMICAL COMPANY: TRIS NITRO:

Brand of 50% Aqueous Tris(Hydroxymethyl)nitromethane*
(EPA Reg. No. 48301-11)

TRIS NITRO is an anti-microbial agent particularly suited for the control of bacteria and slimes in industrial applications. It is available as a 50% aqueous solution of tris-(hydroxymethyl)nitromethane.

Purified TRIS NITRO is a white crystalline solid which is quite stable when dry. At its melting point crystalline TRIS NITRO decomposes slowly, but there is no tendency for this decomposition to become self-sustaining because the reaction is endothermic.

TRIS NITRO is highly soluble in water and is quite stable in neutral or weakly acidic solution. However, in slightly alkaline solution TRIS NITRO slowly decomposes to release formaldehyde. Formaldehyde is released more rapidly as pH is increased. This release can be easily controlled by pH adjustment and/or temperature so that the working life of TRIS NITRO can be varied from a few minutes to several months according to conditions of use.

Typical Physical Properties of the 50% Aqueous Solution

Crystallization point (approx.)	55F
Specific gravity at 25/25C	1.222

Specifications of the 50% Aqueous Solution

TRIS NITRO, % by wt	50 (min.)
Free formaldehyde, % by wt	1 (max.)
pH, as is	2.0-4.5
Color, Gardner	5.0 (max.)

* CAS Registry No. 126-11-4

BEDFORD CHEMICAL DIVISION: MICRO-CHEK Antimicrobials:

MICRO-CHEK is an EPA registered industrial mildewcide for PVC, polyurethane and other polymer compositions susceptible to attack by microorganisms. With proper use, MICRO-CHEK will help prevent microbiological attack on the product surface that can cause the loss of aesthetic appearance, mildew odors, embrittlement and premature product failure.

MICRO-CHEK is a 4.0% solution of the active ingredient of 2-n-octyl-4-isothiazolin-3-one carried in several different plasticizers. The isothiazolone is low migrating which enables MICRO-CHEK to effectively provide protection in the most stressful of environments in such applications as roofing membranes, automotive trim, awnings, pond liners, marine upholstery, shower curtains and outdoor furniture. MICRO-CHEK can also provide superior performance in less severe interior applications such as wall coverings, shelf liners, and refrigerator door gasketing.

Product Name:

MICRO-CHEK 11

Carrier: Epoxidized soybean oil
Density (lb/gal): 8.30
EPA Number: 1486-19

MICRO-CHEK 11D

Carrier: Di(2-ethyl hexyl) phthalate
Density (lb/gal): 8.21
EPA Number: 1486-19

MICRO-CHEK 11 DIDP

Carrier: Diisodecyl phthalate
Density (lb/gal): 8.10
EPA Number: 1486-19

MICRO-CHEK 11 S-711

Carrier: Mixed dialkyl phthalates
Density (lb/gal): 8.20
EPA Number: 1486-19

MICRO-CHEK 11 S-160

Carrier: Butyl Benzyl Phthalate
Density (lb/gal): 9.00
EPA Number: 1486-19

MICRO-CHEK 11 IPA

Carrier: Isopropyl Alcohol
Density (lb/gal): 6.70
EPA Number: 1486-19

MICRO-CHEK 11 T

Carrier: Toluene
Density (lb/gal): 7.25
EPA Number: 1486-19

18 Fungicides, Biocides and Preservatives

BEECHAM HOME IMPROVEMENT PRODUCTS, INC.: Water Based WOODLIFE:
4-1 Concentrate & Ready-To-Use:

Description:

Water Based WOODLIFE is a waterborne, penetrating, paintable water-repellent preservative for wood and wood-based products. The preservative, 3-iodo-2 propynyl butyl carbamate, gives effective protection against mold, mildew, staining and decay fungi. The water repellency provides dimensional stability to minimize checking and warping of wood and wood products.

The preservative, 3-iodo-2 propynyl butyl carbamate (Polyphase), is a fungicide with low toxicity and spills are not considered a hazardous waste.

Water Based WOODLIFE is non-film forming and is not a sealer but penetrates deeply into the wood. It will not peel or chip like conventional finishes and will function as an excellent base for most paints and finishes.

Water Based WOODLIFE is water-based and therefore non-flammable. This makes it easy to clean up with water.

Water Based WOODLIFE is available as a ready-to-use (RTU) or 4:1 Concentrate.

Specifications:

Conforms to Industrial Standard 1 S 4-81 and is approved by N.W.W.D.A. Meets all current and proposed government environmental standards.

Uses:

Water Based WOODLIFE is designed for wood products that will be used above ground line level.

Water Based WOODLIFE provides water-repellent preservative protection for millwork items, structural lumber, siding, trusses, flooring, sub-flooring, outside signs, truck and farm equipment bodies, fencing, patios, plywood, and reconstituted wood.

Water Based WOODLIFE can be used as a clear, natural finish for exterior woods.

Water Based WOODLIFE, when dry, is an excellent base for paints, and primers, both solvent and latex types, and varnish.

Physical Properties (Ready-To-Use):

Active Ingredients:	0.5% 3-iodo-2 propynyl butyl carbamate (IPBC) RTU
Color:	Opaque, creamy color
Viscosity:	25-50 CPS Brookfield Model RVT, #1 spindle @ 50 rpm
Flashpoint:	None
Odor:	Mild in solution, odor free when dry
Weight/Gallon:	8.0-9.0 lb.

EPA Registered (#1409-50, concentrate)
(#1409-51, ready-to-use)

**BEECHAM HOME IMPROVEMENT PRODUCTS, INC.: WOODLIFE-F Water
Repellent Preservative for Wood:**

Description:

WOODLIFE-F is a clear, penetrating, paintable water-repellent preservative for wood and wood-based products. The preservative, 3-iodo-2 propynyl butyl carbamate, provides effective protection against mold, mildew, staining and decay fungi. The water repellency feature provides dimensional stability to minimize checking, splitting, and warping of wood and wood products.

WOODLIFE-F is non-film forming and is not a sealer but penetrates deeply into wood. It will not peel or chip like conventional finishes and will function as an excellent base for most paints and finishes.

Specifications:

Conforms to Industrial Standard I S 4-81 and is approved by N.W.W.D.A. Meets all current proposed government environmental standards.

Uses:

WOODLIFE-F is designed for wood products that will be used above ground line level.

WOODLIFE-F provides water-repellent preservative protection for millwork items, structural lumber, siding, trusses, flooring, subflooring, outside signs, truck and farm equipment bodies, fencing, patios, plywood, and reconstituted wood.

WOODLIFE-F can be used as a clear, natural finish for exterior woods.

WOODLIFE-F, when dry, is an excellent base for paints, and primers, both solvent and latex types, and varnish.

Physical Properties:

Active Ingredients:	0.5% 3-iodo-2 propynyl butyl carbamate (Polyphase)
Color:	Clear - very light straw
Viscosity:	Less than water, A-4 Gardener Bubble
Flashpoint:	105F (40C) Tag Closed Cup
Odor:	Petroleum distillate
Weight/Gallon:	6.65 lb./Gal.
Carrier (Solvent):	Mineral spirits

EPA Reg. No. 1409-63

20 Fungicides, Biocides and Preservatives

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides:

Product Name:

BETZ EnChem 41-J1 Biocide

- Combination corrosion inhibitor and bactericide for sweet or sour systems
- Effective on sulfate-reducing bacteria and slime-forming bacteria
- Exhibits strong film forming tendencies

Description and Use

41-J1 is a combination bactericide and corrosion inhibitor for use in oil field water systems. It is particularly effective for the control of sulfate-reducing and slime-forming bacteria. It also exhibits strong film forming properties for the control of corrosion caused by hydrogen sulfide, carbon dioxide, acids and salts.

Typical Applications

41-J1 can be fed at any point where microbiological growth is a problem. The product is a combination bactericide and corrosion inhibitor for use in treating water in surface equipment, injection wells, packer fluids and drilling muds.

41-J1 can be fed intermittently or continuously depending upon the location, extent, and other circumstances surrounding the problem. The product should be fed neat.

General Properties

n-Alkyl*-1,3-Propylene Diamines	41.7%
Isopropyl Alcohol	58.3%
*4% C8, 5% C10, 42% C12, 15% C14, 8% C16, 26% C18	
Environmental Protection Agency Registration No.	8928-2-48525
Appearance	clear amber liquid
Density (70F)	6.8 lbs/gal.
Flash Point (closed cup)	59F
Freeze Point	10F
pH (undiluted)	12.3
pH (5% solution)	11.0
Pour Point (ASTM)	15F
Specific Gravity (70F)	0.819
Viscosity (70F)	8 cps

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides(Continued):

Product Name:

BETZ EnChem 41-J2 Biocide

- Specially formulated liquid biocide effective on a variety of common oil field organisms
- EPA Registered biocide
- May be fed continuously or intermittently depending on severity of problem

Description and Use

BETZ EnChem 41-J2 is a specially formulated liquid biocide for the control of slime forming bacteria, fungi, algae and sulfate reducers in oil field water systems.

Typical Applications

41-J2 is a highly effective biocide for oil field water systems. The product can be fed to source wells, at free water knockouts, before or after flotation cells and filters, or after the injection pumps.

41-J2 is also used in packer fluids and drilling muds.

General Properties

Dodecylguanidine Hydrochloride	10%
Methylenebis (Thiocyanate)	5%
Inert Ingredients (including solubilizing and dispersing agents)	85%
EPA Registration Number	3876-122
Appearance	yellow liquid
Density (70F)	9.12 lbs/gal.
Flash Point (closed cup) (Setaflash)	120F
Freeze Point	<-30F
pH (undiluted)	3.2
pH (5% solution)	3.4
Pour Point (ASTM)	<-30F
Specific Gravity (70F)	1.095
Viscosity (70F)	64 cps

22 Fungicides, Biocides and Preservatives

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides (Continued):

Product Name:

BETZ EnChem 41-J3 Biocide

- Excellent broad spectrum biocide
- Highly effective on sulfate reducers and aerobic bacteria
- Inert to ion exchange resins

Description and Use

41-J3 is a specially formulated liquid biocide effective in controlling slime forming bacteria, algae, fungi and sulfate reducing bacteria in oil field water systems.

Typical Applications

41-J3 can be fed to source wells, at free water knock-outs, before or after flotation cells, filters and surge tanks or after injection pumps.

41-J3 may also be used in packer fluids and drilling muds.

General Properties

B-Bromo-B-Nitrostyrene	9.2%
Methylenebis (thiocyanate)	4.9%
Inert Ingredients (includes solubilizing and dispersing agents)	85.9%
EPA Registration No.	48525-8
Appearance	clear, light-yellow liquid
Density (70F)	8.04 lbs. per gallon
Flash Point (Seta Flash closed cup)	140F
Freeze Point	<-51F
pH (50% solution in water)	2.8
Pour Point (ASTM)	<-30F
Solubility	HAN Soluble
Specific Gravity (70F)	0.968
Viscosity (70F)	4.9 cps

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides (Continued):

Product Name:

BETZ EnChem 41-J4 Biocide

- Excellent broad spectrum biocide
- Effective on sulfate-reducing and slime forming bacteria
- Environmentally safe, detoxifiable

Description and Use

41-J4 is a specially formulated liquid biocide effective in controlling slime forming bacteria, algae, fungi and sulfate reducing bacteria in oil field water systems. The product can be detoxified with sulfite.

Typical Applications

41-J4 is a highly effective biocide for oil field water systems. The product can be fed to source wells, at free water knock-outs, before or after flotation cells, filters and surge tanks or after injection pumps.

41-J4 may also be used in drilling muds.

General Properties

B-Bromo-B-Nitrostyrene	10.0%
Inert Ingredients (includes solubilizing and dispersing agents)	90%
EPA Registration Number	48525-9
Appearance	clear, yellow liquid
Density (70F)	7.89 lbs. per gallon
Flash Point (Seta Flash closed cup)	136F
Freeze Point	<-30F
pH (50% solution in water)	2.8
Pour Point (ASTM)	<-30F
Solubility	HAN soluble
Specific Gravity (70F)	0.947
Viscosity (70F)	4.4 cps

24 Fungicides, Biocides and Preservatives

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides(Continued):

Product Name:

BETZ EnChem 41-J5 Biocide

- Broad spectrum biocide
- Effective on sulfate reducing and slime forming bacteria
- Excellent cost/performance

Description and Use

41-J5 is a specially formulated liquid biocide effective in controlling slime forming bacteria, algae, fungi and sulfate reducing bacteria in oil field water systems.

Typical Applications

41-J5 can be fed to source wells, at free water knock-outs, before or after flotation cells, filters and surge tanks or after injection pumps.

41-J5 may also be used in packer fluids and drilling muds.

General Properties

Bis (trichloromethyl) sulfone	20.0%
Methylenebis (thiocyanate)	5.0%
Inert Ingredients (includes solubilizing and dispersing agents)	75.0%
EPA Registration No.	48525-10
Appearance	clear, amber liquid
Density (70F)	8.7 lbs. per gallon
Flash Point (Seta Flash closed cup)	140F
Freeze Point	<-30F
pH (50% solution in water)	2.6
Pour Point (ASTM)	<-30F
Solubility	HAN Soluble
Specific Gravity (70F)	1.045
Viscosity (70F)	6 cps
Viscosity (40F)	7.7 cps

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides (Continued):

Product Name:

BETZ EnChem 41-J6 Biocide

- Excellent broad spectrum biocide
- Effective against slime-forming and sulfate-reducing bacteria
- EPA registered biocide
- Cost effective multi-component biocide

Description and Use

BETZ EnChem 41-J6 is a specially formulated liquid biocide effective in controlling slime-forming bacteria, algae, fungi, and sulfate-reducing bacteria in oilfield waters.

41-J6 is stable under reducing conditions and is extremely cost effective in treating non-recirculating water systems.

Typical Applications

41-J6 can be fed to source wells, at free water knock-outs, before or after flotation cells, filters and surge tanks or after injection pumps. 41-J6 should be applied to recommendations.

General Properties

Pentachlorophenol	8.6%
Other Chlorophenols and related compounds	1.0%
Methylene bis (thiocyanate)	4.9%
Inert Ingredients (including solubilizing and dispersing agents)	85.5%
EPA Registration Number	48525-11
Appearance	dark amber liquid
Density (70F)	8.180 lbs/gal
Flash Point (Seta Flash closed cup)	147F
Freeze Point	-25F
Pour Point	<-25F
pH (50% solution)	4.2
Solubility	Aromatic petroleum fractions
Specific Gravity (70F)	0.982
Viscosity	4.0 cps
Viscosity (70F)	3.4 cps

26 Fungicides, Biocides and Preservatives

BETZ ENERGY CHEMICALS, INC.: BETZ EnChem Biocides (Continued):

Product Name:

BETZ EnChem 41-J7 Biocide

- Excellent broad spectrum biocide
- Effective on sulfate reducing and slime forming bacteria
- Excellent cost/performance

Description and Use

41-J7 is a specially formulated liquid biocide effective in controlling slime forming bacteria, algae, fungi and sulfate reducing bacteria in oil field systems.

Typical Applications

41-J7 can be fed to source wells, at free water knock-outs, before or after flotation cells, filters and surge tanks or after injection pumps.

41-J7 may also be used in packer fluids and drilling muds.

General Properties

N-Alkyl (C12-5%, C14-60%, C16-30%, C18-5%) dimethyl benzyl ammonium chloride	24.0%
Bis (tributyltin) oxide	5%
Inert Ingredients (includes solubilizing and dispersing agents)	71%
EPA Registration Number	48525-12
Appearance	hazy, pale-yellow liquid
Density (70F)	8.23 lbs. per gallon
Flash Point (Seta Flash closed cup)	129F
Freeze Point	28F
pH (undiluted)	11.9
pH (5% solution)	10.8
Pour Point (ASTM)	33F
Solubility	water soluble
Specific Gravity (70F)	0.988
Viscosity (70F)	31.5 cps

BETZ LABORATORIES, INC.: BETZ ENTEC 343 Slime Control Agent:

- Slow release chlorine agent
- Pelletized for convenience of application
- Cost-effective--Apply directly to fouled areas

Description and Use

BETZ ENTEC 343 aids in the control of bacterial and fungal slimes in recirculating cooling tower water systems and brewery pasteurizers.

General Properties

1,3-dichloro-5,5-dimethylhydantoin	91%
Inert ingredients	9%
Environmental Protection Agency Registration Number	34571-5
Appearance	white pellets
Dimensions	5/8 in. by 1 in. diam.
pH (0.1 % solution)	5.2
Solubility	slowly soluble to 2000 ppm

28 Fungicides, Biocides and Preservatives

BETZ LABORATORIES, INC.: BETZ Slimicides:

Product Name:

BETZ Slimicide C-31

- Broad spectrum slime control agent
- Effective over a wide pH range
- Controls fungi, algae and bacteria

Description and Use

BETZ Slimicide C-31 is a blend of dodecylguanidine hydrochloride and methylenebis (thiocyanate) with organic dispersants and penetrants. This product is designed to perform as a broad spectrum antimicrobial agent for the control of fungal, algal and bacterial slimes in air conditioning, evaporative condensers, heat exchange water systems, cooling tower and influent water systems, industrial water scrubbing systems, brewery pasteurizers and cannery cooling water.

General Properties

Appearance	yellow to yellow-orange liquid
Density (70F)	9.1 pounds per gallon
Flash Point (closed cup)	120F
Freeze Point	-40F
pH (undiluted)	3.2
pH (5% solution)	3.4
Pour Point	-35F
Specific Gravity (70F)	1.095
Viscosity (70F)	64 cps

EPA Reg. No. 3876-121

BETZ LABORATORIES, INC.: BETZ Slimicides:

Product Name:

BETZ Slimicide C-58P

- No Expensive Chlorination Equipment.
- Easier to Handle and Apply than Gaseous Chlorine.
- Cost-Effective - Apply Directly to Fouled Areas.
- Effective on Bacterial, Fungal, Algal Fouling.
- Compatible with BETZ Corrosion Inhibitors.
- Long-Lasting Protection--Slow Chlorine Release.

Description and Use

BETZ Slimicide C-58P aids in the control of bacterial, fungal and algal slimes in evaporative condensers, heat exchange water systems, commercial and industrial cooling towers, influent systems such as flow through, infilco units, filters, lagoons, etc., industrial water scrubbing systems and brewery pasteurizers.

General Properties

Trichloro-s-Triazinetrione	99.5%
Inert Ingredients	0.5%
EPA Registration Number	3876-138
Appearance	White Tablet (wt. 7 oz.)
pH (1% solution)	2.0-3.7
Solubility (77F)	1.2%

30 Fungicides, Biocides and Preservatives

BETZ LABORATORIES, INC.: BETZ Slimicides (Continued):

Product Name:

BETZ Slimicide C-63P

- Effective on Bacterial, Fungal and Algal Fouling
- Easier to Handle and Apply than Gaseous Chlorine
- More Effective than Chlorine at High pH
- Long-Lasting Protection--Slow Bromine and Chlorine Release
- Compatible with BETZ Corrosion Inhibitors

Description and Use

BETZ Slimicide C-63P is a pelletized slime control agent that aids in the control of bacterial, fungal and algal slimes in industrial recirculating cooling towers.

General Properties

Appearance	White cylindrical pellets 3" long, 3/4" diameter
1-Bromo-3-Chloro-5,5-Dimethylhydantoin	96%
Inert Ingredients	4%
EPA Reg. No.	5785-57-3876
Solubility	slowly solubilizes up to 1500 ppm

BETZ LABORATORIES, INC.: BETZ Slimicides (Continued):

Product Name:

BETZ Slimicide C-70

- Eliminates the need to handle gaseous chlorine
- Effective against bacterial, fungal, and algal slimes
- Will not depress cooling water pH

Description and Use

BETZ Slimicide C-70 is a liquid source of chlorine which aids in the control of bacterial, fungal, and algal slimes in cooling tower water systems.

General Properties

Appearance	clear yellow-green liquid
Sodium hypochlorite	12.5%
Inert ingredients	87.5%
EPA Reg. No.	1744-19-3876
Density (70F)	10.1 lbs/gal
Flash Point (open cup)	200F
Freeze Point	-14.0F
Freeze/Thaw Stability (3 cycles)	Stable
pH (Neat)	12.5
Pour Point (ASTM)	-9.0F
Specific Gravity (70F)	1.22
Viscosity (70F)	13.2 cps

32 Fungicides, Biocides and Preservatives

BETZ LABORATORIES, INC.: BETZ Slimicides(Continued):

Product Name:

BETZ Slimicide J-12

- General slime control product
- Excellent for algae control at all pH ranges encountered in cooling systems
- Available on POINT OF FEED Service Program

Description and Use

BETZ Slimicide J-12 aids in the control of bacterial, fungal, and algal slimes in evaporative condensers, heat exchange water systems, commercial and industrial cooling towers, influent systems (such as flow through, Infilco units, filters, lagoons, etc.), industrial water scrubbing systems, and brewery pasteurizers.

General Properties

N-Alkyl (C12-5%, C14-60%, C16-30%, C18-5%)	
dimethyl benzyl ammonium chloride	24.0%
Bis (tributyltin) oxide	5.0%
Inert Ingredients (including solubilizing and dispersing agents)	71.0%
Environmental Protection Agency Registration Number	3876-34
Appearance	light tan liquid
Density (70F)	8.2 pounds per gallon
Flash Point (open cup)	175F
Flash Point (closed cup)	125F
Freeze Point	26F
pH (one percent solution)	10.6
Specific Gravity (70F)	0.988
Viscosity (70F)	45.2 cps

BETZ LABORATORIES, INC.: BETZ Slimicides (Continued):

Product Name:

BETZ Slimicide 508

- Minimal environmental impact
- Registered for use in a wide variety of systems
- Compatible with all BETZ cooling water treatment programs

Description and Use

BETZ Slimicide 508 aids in the control of bacterial, fungal, and algal slimes in evaporative condensers, heat exchange water systems, commercial and industrial cooling towers, influent systems, industrial water scrubbing systems, and brewery pasteurizers. It is also registered for use in once-through and closed-cycle systems, including cooling ponds, canals and lagoons.

In addition, Slimicide 508 controls slime-forming bacteria and fungi in industrial air washer systems. It is also effective in controlling and inhibiting the growth of bacteria, fungi, and yeasts that may deteriorate metalworking fluids containing water.

Slimicide 508 can be used in an alternating program with any other BETZ Slimicide, and is compatible with all other BETZ cooling products.

General Properties

2,2-dibromo-3-nitrilo propionamide (DBNPA)	20.0%
Inert ingredients (including stabilizing and dispersing agents)	80.0%
EPA Registration	3876-95
Appearance	clear, yellow liquid
Density (70F)	10.6 lbs. per gallon
Flash Point (closed cup)	>200F
Freeze Point	<-30F
Pour Point (ASTM)	<-30F
pH (undiluted)	1.9
pH (5% solution)	3.3
Specific Gravity (70F)	1.274
Viscosity (40F)	188 cps
Viscosity (70F)	64 cps

34 Fungicides, Biocides and Preservatives

BUCKMAN LABORATORIES: BUSAN 40:

- Broad-spectrum control of bacteria and fungi
- Completely soluble in water
- Compatible with all other Buckman microbiocides and dispersants

BUSAN 40 is used for the control of bacterial and fungal slime in pulp and paper mill systems and for the preservation of those papermaking materials susceptible to microbiological degradation. It is highly effective against microorganisms over a wide range of acidic to alkaline pH conditions.

BUSAN 40 is registered with the Environmental Protection Agency (EPA Reg. No. 1448-52) and is allowed for use in the manufacture of paper and paperboard under 21 CFR 176.300 of the U.S. Food and Drug Administration regulations.

This water-soluble product can be fed into the system directly from the shipping containers by use of chemical-metering pumps. It can also be dispensed in suitable measuring containers or by means of drip-feed devices.

Product Characteristics

Active ingredient:

Potassium N-hydroxymethyl-N-methyldithiocarbamate 40%

Inert ingredients 60%

Benefits of Busan 40 treatment

Benefits obtained in mills using Busan 40 include improved paper quality, increased production, minimized breaks, reduced downtime, and reduced losses attributable to degradation of papermaking raw materials.

BUCKMAN LABORATORIES: BUSAN 90:

- Broad-spectrum microbiocide for the pulp and paper industry
- Especially effective against pink slime and freshwater organisms
- Protects coating formulations and papermaking chemicals from biodegradation
- Doesn't affect the brightness of paper

BUSAN 90, a broad-spectrum biocide, provides microorganism control in pulp and paper manufacture and in related systems. It is used to control slime and to protect coating formulations, starch slurries, alum, glue, and other papermaking chemicals.

The product is compatible with most pulp mill stocks and paper mill finishes. When employed for slime control, BUSAN 90 is not retained by the paper or paperboard. Nor does it contribute odor or taste to the paper or paperboard products. The brightness of the sheet is not affected by its use.

Busan 90 is registered with the Environmental Protection Agency (EPA Reg. No. 1448-23) and is allowed for use in the manufacture of paper and paperboard under 21 CFR 176.170 and 176.300 of the U.S. Food and Drug Administration regulations.

Product Characteristics

Active ingredient:	
2-Bromo-4'-hydroxyacetophenone	30%
Inert ingredients	70%

Benefits of BUSAN 90 treatment

Use of BUSAN 90 has produced consistently good results in numerous paper mill systems. The product is especially effective in controlling pink slime and deposits containing troublesome freshwater organisms such as filamentous iron bacteria. As a consequence of its use, the papermaker has reduced downtime, improved quality, and increased machine speeds.

CALGON CORP.: Microbiocides:

Product Name:

H-130 Microbiocide

Description:

H-130 is a non-oxidizing liquid organic biocide containing quaternary ammonium compounds formulated for use in industrial cooling water systems. H-130 effectively controls growth of bacteria and algae. It is particularly effective in controlling iron bacteria and sulfate-reducing bacteria. High surface activity promotes system cleanliness by loosening and dispersing existing slime deposits from surfaces of cooling system equipment.

Advantages:

- Easier to achieve biological control with one product since H-130 controls the growth of bacteria, particularly iron bacteria, sulfate reducing bacteria, and algae.
- H-130 is a non-oxidizing biocide which means that the biocide is available for microbiological control rather than being consumed by inorganic reducing substances in the cooling water.
- H-130 is biodegradable at use concentrations, so it provides an environmentally acceptable treatment.
- Surface-active properties of H-130 provide a cleansing action which minimizes under-deposit corrosion. This means improved heat transfer and lower operating costs.
- Effective for use in hard waters at low use concentrations which means that H-130 is a cost-effective microbiological treatment to complement water and cost savings associated with operating at high cycles of concentration.
- Addition of H-130 to the cooling water does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.

EPA Registration

Microbiocide H-130 is registered by the Environmental Protection Agency (EPA Registration No. 10445-12) as a biocide for use in cooling water systems.

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-204 Microbiocide

Description:

H-204 Microbiocide is a non-oxidizing liquid, organic biocide containing both quaternaries and organometallic compounds formulated for use in industrial water systems. H-204 prevents growth of microorganisms encountered in recirculating, nonpotable, industrial cooling water systems. It also forms a microbiocidal film, resistant to water leaching, on wood and metal surfaces in the system, thus providing residual treatment for considerable lengths of time.

Advantages

- Easier to achieve biological control with one product since H-204 is capable of controlling the growth of bacteria, algae, and fungi.
- H-204 is a non-oxidizing biocide which means that it is available for microbiological control rather than being consumed by inorganic reducing substances in the cooling water.
- A protective film is formed on wood and metal surfaces which inhibits biological growth for an extended period of time. This provides a cost-effective biological control program since low dosages fed intermittently or continuously control microbiocidal growth.
- Protects cooling tower wood from fungal attack which results in lower maintenance and replacement costs.
- Surface active properties of H-204 promote system cleanliness with a minimum amount of foaming. System cleanliness results in better heat transfer on metal surfaces which reduces operating costs.
- Addition of H-204 to the cooling water does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.

EPA Registration

Microbiocide H-204 is registered by the Environmental Protection Agency (EPA Registration No. 10445-4) as a biocide for use in cooling water systems.

CALGON CORP.: Microbiocides (Continued):

Product Name:

H-212 Microbiocide

Description:

H-212 Microbiocide is a non-oxidizing liquid, organic biocide containing both cationic nitrogen based and organo-metallic compounds formulated for use in industrial water systems. H-212 prevents growth of microorganisms encountered in recirculating, nonpotable, industrial cooling water systems. It also forms a microbiocidal film, resistant to water leaching, on wood and metal surfaces in the system, thus providing residual treatment for considerable lengths of time.

Advantages

- Easier to achieve biological control with one product since H-212 is capable of controlling the growth of bacteria, algae, and fungi.
- H-212 is a non-oxidizing biocide which means that it is available for microbiological control rather than being consumed by inorganic reducing substances in the cooling water.
- A protective film is formed on wood and metal surfaces which inhibits biological growth for an extended period of time. This provides a cost-effective biological control program since low dosages fed intermittently or continuously control microbiological growth.
- Protects cooling tower wood from fungal attack which results in lower maintenance and replacement costs.
- Surface active properties of H-212 promotes system cleanliness with a minimum amount of foaming. System cleanliness results in better heat transfer on metal surfaces which reduces operating costs.
- Addition of H-212 to the cooling water does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.

EPA Registration

Microbiocide H-212 is registered by the Environmental Protection Agency (EPA Registration No. 10445-6) as a biocide for use in cooling water systems.

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-300 Microbiocide

Description:

H-300 Microbiocide is a non-oxidizing liquid organic biocide containing glutaraldehyde which is formulated for use in industrial recirculating cooling systems, air washer systems, brewery pasteurizer cooling water system, and industrial closed, recirculating process water systems. H-300 prevents growth of bacteria, algae and fungi encountered in recirculating cooling water and air washer systems.

Advantages

- Effective for controlling growth of algae, bacteria (including sulfate reducing bacteria) and fungi at low concentrations providing a cost-effective treatment.
- May be used in conjunction with chlorination or other non-oxidizing biocides, but has been found to be effective when used as the sole means of biological control. This provides a simple treatment approach and minimizes costs associated with operator training and chemical inventory.
- Non-foaming biocide, therefore there is no additional cost for antifoams.
- Applicable to cooling water systems operating in a broad pH range and high cycles of concentration which means effective biological control regardless of operating conditions. It is particularly effective in controlling biological growth in cooling waters with a pH >8.0.
- Addition of H-300 to cooling water does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.
- The chloride and fluoride concentration of H-300 is low which means that it may be successfully applied for biological control in nuclear pressurized water reactor (PWR) and boiler water reactor (BWR) systems without adversely affecting metallurgy.

EPA Registration/F&DA Approval

Microbiocide H-300 is registered by the Environmental Protection Agency (EPA Registration No. 10352-22-10445) as a biocide for industrial recirculating cooling water including brewery pasteurizer cooling water systems and industrial closed, recirculating process water systems and air washer systems.

H-300 is authorized for use under USDA inspection and grading program for meat, poultry, and egg plants.

40 Fungicides, Biocides and Preservatives

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-380 Microbiocide

Description:

H-380 Microbiocide is dry formulation which is applied to ponds for control of undesirable algae and aquatic weeds. Control is accomplished by absorption of H-380 by algae and weeds inhibiting the photosynthesis process. H-380 is applied on ponds in a form of a powder or as a slurry to destroy algae and certain submerged weeds to extend the useful life of the pond.

Advantages

- Keeps pond water clean and clear, which improves aesthetics and recreational functions. Fishing and swimming are permitted in treated ponds.
- Slows build up of organic materials on the bottom of the pond, extending the life of the pond.
- Reduces possibility of naturally occurring fish kills from an on-going decomposition of organic materials.
- Prevents bad odors caused by algae accumulations.
- H-380 degrades a few months after pond treatment into simple compounds which leave no harmful residues. H-380 is more environmentally acceptable than copper compounds which persist in the elemental form indefinitely after treatment.
- Particularly effective against undesirable algae, those that are toxic or produce objectionable odors and tastes rather than desirable algae and aquatic plants necessary to the continuation of the food chain.
- Effective against pond plants at very low concentrations providing a cost effective pond treatment.
- Due to its sparing solubility, H-380 is gradually absorbed by weeds and algae resulting in a controlled, slow kill. A slow kill minimizes the danger of extreme oxygen depletion which could result from massive decomposition of algae and plant growth.
- Provides control of algae and weeds for a full season as long as it is applied near the beginning of the infestation period.

Registrations

H-380 is registered by the Environmental Protection Agency (Registration No. 40810-3-10445) as an algicide/herbicide for cooling and wastewater treatment ponds. This product is not registered for use in recirculating cooling water systems.

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-430 Microbiocide

Description

H-430 Microbiocide is a non-oxidizing liquid dibromopropionamide compound formulated for use in open recirculating cooling towers, once-through fresh water and seawater industrial cooling systems. H-430 prevents growth of microorganisms such as fungi, bacteria and algae in industrial cooling systems and air washers.

Advantages

- Environmentally acceptable since H-430 degrades to form carbon dioxide, ammonia, and bromide. This eliminates problems and discharge regulations whether applied in once-through or recirculating cooling systems.
- May be used cost-effectively as the only non-oxidizing biocid treatment or in conjunction with chlorination to achieve microbiological control. This provides flexibility in establishing an optimum program for a cooling water system.
- H-430 is effective regardless of temperature, therefore it is applicable to both air washer and recirculating cooling systems.
- Minimizes growth of microorganisms found in industrial cooling and air washer systems which means improved heat transfer on metal surfaces and lower operating costs.
- Addition of H-430 to the cooling water does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.

EPA Registration

Microbiocide H-430 is registered by the Environmental Protection Agency (EPA Registration No. 10445-17) as a biocide for industrial recirculating water, once-through fresh and seawater, and air washer systems.

42 Fungicides, Biocides and Preservatives

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-450 Microbiocide

Description:

H-450 Microbiocide is a non-oxidizing liquid carbamate compound formulated for use in industrial cooling water systems. H-450 prevents growth of microorganisms such as fungi, bacteria, including sulfate-reducing bacteria, and algae in industrial cooling water systems and air washer systems.

Advantages

- Effective regardless of temperature, therefore it is applicable to both air washer and recirculating cooling systems.
- Minimizes growth of microorganisms found in industrial cooling and air washer systems which improves heat transfer on metal surfaces and lower operating costs.
- A non-oxidizing biocide which means that the biocide is available for microbiological control rather than being consumed by inorganic reducing substances in the cooling water.
- Effective for use in hard waters or waters with high dissolved solids which means that H-450 is a cost-effective microbiological treatment to complement water and cost savings associated with operating at high cycles of concentration.
- Particularly effective against algae which allows use of a single biocide treatment for sustaining biological control and an optimum treatment when system upsets occur.
- Addition of H-450 does not depress the pH of the bulk water and does not form corrosive by-products as found with chlorination. Corrosion of metal surfaces is not accelerated by biocide treatment.

EPA Registration

Microbiocide H-450 is registered by the Environmental Protection Agency (EPA Registration No. 10445-58) as a biocide for industrial recirculating water and air washer systems.

CALGON CORP.: Microbiocides(Continued):

Product Name:

H-510 Microbiocide

Description:

H-510 Microbiocide is a non-oxidizing liquid organic biocide containing isothiazoline compounds formulated for use in industrial cooling systems and air washer systems. H-510 prevents growth of bacteria, algae, and fungi encountered in recirculating cooling water and air washer systems.

Advantages

- Effective for controlling growth of algae, bacteria (including sulfate reducing bacteria) and fungi at low concentrations providing a cost-effective treatment.
- May be used in conjunction with chlorination or other non-oxidizing biocides, but has been found to be effective when used as the sole means for biological control. This provides a simple treatment approach based on chemical inventory requirements and operator training.
- Applicable to cooling water systems operating in a broad pH range and high cycles of concentration which means effective biological control regardless of operating conditions.
- Non-foaming biocide therefore no additional expenditure or inventory is required for antifoams.

EPA Registration

Microbiocide H-510 is registered by the Environmental Protection Agency (EPA Registration No. 10445-66) as a biocide for industrial cooling water or air washer systems.

44 Fungicides, Biocides and Preservatives

CALGON CORP.: Microbiocides (Continued):

Product Name:

H-900 Microbiocide

Description

CALGON H-900 Microbiocide is a chlorine/bromine-donating organic compound in stick form formulated for use in industrial recirculating and once-through cooling water, air washers, brewery pasteurizers, cooling ponds, lagoons, and canals. H-900, when dissolved in water, releases powerful oxidizing hypohalous acids which are highly effective in preventing biomass fouling in industrial recirculating cooling water systems. H-900 also controls the growth of microorganisms in the bulk recirculating water and removes existing bio-fouling from system surfaces.

Advantages

- H-900 is supplied as solid pre-sized sticks.
- H-900 effectively controls microorganisms in cooling water systems operating over a pH range of 6.0 to 9.0.
- H-900 provides broad spectrum control of slime-producing microorganisms such as bacteria, fungi, and algae in open recirculating cooling water systems.
- H-900 has proven extremely effective in controlling the buildup of attached biomass on system surfaces.
- When ammonia is present in cooling waters, both chlorine and bromine will react with it to form haloamines.
- H-900 releases balanced amounts of residual hypobromous and hypochlorous acids.

EPA Registration

H-900 is registered by the United States Environmental Protection Agency (EPA Registration No. 5785-57-AA-1044) as a biocide for use in industrial recirculating and once-through cooling water, air washers equipped with mist eliminators, brewery pasteurizers, cooling ponds, lagoons, and canals.

CALGON CORP.: Microbiocides (Continued):

Product Name:

H-900G Microbiocide

Description:

CALGON H-900G Microbiocide is a chlorine/bromine-donating organic compound in granular form, facilitating rapid delivery into the cooling system. H-900G is registered for use in cooling water systems (once-through and recirculating), water scrubbing systems, air washer systems equipped with mist eliminators, brewery pasteurizers, cooling ponds, lagoons, and canals. H-900G, when dissolved in water, releases powerful hypochlorous acids which are highly effective in preventing biomass fouling in industrial recirculating cooling water systems. H-900G also controls the growth of microorganisms in the bulk of recirculating water and removes existing biofouling from system surfaces.

Advantages

- H-900G's physical form is conducive to rapid application to fouled systems, resulting in a "shock" treatment, quickly arresting biological activity.
- H-900G effectively controls microorganisms in cooling water systems operating over a pH range of 6.0 to 9.0.
- H-900G provides broad spectrum control of slime-producing microorganisms such as bacteria, fungi, and algae in open recirculating cooling water systems.
- H-900G has proven extremely effective in controlling the buildup of attached biomass on system surfaces.
- H-900G remains active in the presence of ammonia.
- H-900G releases balanced amounts of residual hypobromous and hypochlorous acid.
- H-900G is supplied as a granular solid.

EPA Registration

H-900G is registered by the United States Environmental Protection Agency (EPA Registration No. 5785-65-AA-10445) as a biocide for use in cooling water systems (once-through and recirculating), water scrubbing systems, air washer systems, equipped with mist eliminators, brewery pasteurizers, cooling ponds, lagoons, and canals.

46 Fungicides, Biocides and Preservatives

CALGON CORP.: BIOCHEK 240:

BIOCHEK 240 is a non-yellowing preservative which effectively inhibits the growth of bacteria in water based paints for household and industrial use, printing inks and adhesives. BIOCHEK 240 is a 39.5% solution of 1,3-bis(hydroxymethyl)-5,5-dimethylhydantoin and hydroxymethyl-5,5-dimethylhydantoin.

Typical Properties

Appearance	Clear solution
Active Ingredients	>39.5%
Water	≤60.5%
Odor	Mildly pungent
pH (as is) 25C	6.5-7.5
Color, APHA	Less than 10
Specific Gravity @ 25C	1.16+/-0.01

EPA Registration No. 38906-16-10445

CALGON CORP.: MERBAC-35:

MERBAC-35 is a preservative for use in the manufacture of aqueous coatings, adhesives, and latex emulsions. Chemically, MERBAC-35 is benzyl bromoacetate.

Typical Properties

Active Ingredient	>90% Benzyl bromoacetate
Description	Off-white, nonionic liquid
Specific Gravity	1.43-1.48
Boiling Point	290F at 10 mm
Flash Point	>250F Cleveland Open Cup

Advantages

- Extremely active against a broad spectrum of micro-organisms which can attack aqueous coatings and adhesives in storage and in containers.
- Nonmetallic - contains no mercury, arsenic, tin, or other heavy metals.
- Compatible with aqueous systems - does not affect brushing, flow, leveling, grinding, viscosity, gloss, oven stability, drying, tinting, or washability properties of aqueous systems.
- Nonionic - does not cause flocculation.
- Stable - does not decompose or hydrolyze on extended storage.

EPA Reg. No. 10445-28

FDA Acceptance under 21 CFR Section 175.105

48 Fungicides, Biocides and Preservatives

CALGON CORP.: METASOL D3T:

METASOL D3T is a preservative effective against a broad spectrum of bacteria and fungi in coatings, clay slurries, adhesives, glues, latex, emulsions, casein, and titanium dioxide slurries. Chemically, the product is tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione.

Typical Properties

Description	Crystalline off-white powder
Active Ingredient	>98%
Specific Gravity	1.3
Water Solubility	Up to 0.1%

EPA Reg. No. 10445-37

FDA acceptance under 21CFR Sections 175.105, 176.230 and 176.300

CALGON CORP.: METASOL D3T-A:

METASOL D3T-A is a preservative which effectively controls microorganisms in casein, emulsions, sizings, pastes, and glue solutions. Chemically, the product is a solution of tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione.

Typical Properties

Active Ingredient	>21%
Color	Pale amber
Specific gravity	1.14-1.18
Freezing point	0F
Flash point	>200F
pH	>13

EPA Registration No. 10445-34

FDA acceptance under 21 CFR Sections 175.105, 176.230 and 176.300

50 Fungicides, Biocides and Preservatives

CALGON CORP.: TEKTAMER 38:

TEKTAMER 38 is a preservative which effectively inhibits the growth of microorganisms in aqueous systems, including paints, emulsions, adhesives, joint cements, pigment dispersions, metal-working fluids, inks, polishes, and waxes. The chemical name of TEKTAMER 38 is a 1,2-dibromo-2,4-dicyanobutane.*

Typical Properties

Active ingredient	98% minimum
Appearance	Off-white to light tan powder
Bulk density (lb/cu ft)	Approximately 48
Melting Point	50-53C
Odor	Mildly pungent
Water solubility @ 20C	1700 ppm

* U.S. Patent numbers 3,833,731; 3,873,597; 3,877,922; 3,929,858
EPA Reg. No. 10445-56
FDA acceptance under 21 CFR Sections 176.170, 175.105 and 176.180

CALGON CORP.: TEKTAMER 38 A.D.:

TEKTAMER 38 A.D. is a preservative which effectively inhibits the growth of microorganisms in aqueous systems, including paints, emulsions, adhesives, joint cements, pigment dispersions, metal-working fluids, inks, polishes and waxes. TEKTAMER 38 A.D. is a 25% dispersion of 1,2-dibromo-2,4-dicyanobutane* in water.

Typical Properties

Active Ingredient	25% minimum
Inert Ingredient	75%
Appearance	Off-white to white liquid
Freezing Point	0C
Specific Gravity	1.1 at 20C
Viscosity (Brookfield RVF, #5 Spindle @ 50 RPM @ 20C)	1800-2400 cps

* U.S. Patent numbers 3,833,731; 3,873,597; 3,877,922; 3,929,858
 EPA Reg. No. 10445-56
 FDA acceptance under 21 CFR Sections 176.170, 175.105 and
 176.180

52 Fungicides, Biocides and Preservatives

CALGON CORP.: TEKTAMER 38 LV:

TEKTAMER 38 LV is a preservative which effectively inhibits the growth of microorganisms in aqueous systems, including paints, emulsions, adhesives, joint cements, pigment dispersions, metalworking fluids, inks, polishes, and waxes. TEKTAMER 38 LV is a 25% dispersion of 1,2-dibromo-2,4-dicyanaobutane* in water.

Typical Properties

Active Ingredient	25% minimum
Inert Ingredients	75%
Appearance	Off-white liquid
Freezing point	0C
Specific gravity	1.15 to 1.17 at 20C
Viscosity (Brookfield LVF, #2 Spindle @ 60 rpm @ 25C)	125-250 cps

* U.S. Patent numbers 3,833,731; 3,873,597; 3,877,922; 3,929,858
EPA Reg. No. 10445-56
FDA acceptance under 21 CFR Sections 176.170, 175.105 and
176.180

CALGON CORP.: TK-100:

TK-100 is a preservative which effectively controls mold and mildew on paint films and on natural and synthetic fibers. Chemically, TK-100 is 2-(4-thiazolyl)-benzimidazole.*

Typical Properties

Active ingredient	98.5% minimum
Appearance	Off-white, free-flowing powder
Bulk density (lb/cu ft)	Approximately 25
Melting point	300C
Specific gravity	1.44
Inert ingredient	<1.5%

Advantages

- Thermally stable
- Effective
- Nonmetallic
- Toxicology
- Stable

* U.S. Patent number 3,370,957

EPA Reg. No. 10445-40

54 Fungicides, Biocides and Preservatives

CALGON CORP.: TK-100 DISPERSION W:

TK-100 DISPERSION W is a fungicide which effectively controls mildew on adhesive and paint films. Chemically, TK-100 DISPERSION W is a dispersion of 2-(4-thiazolyl) benzimidazole.*

Typical Properties

Active ingredient	50% 2-(4-thiazolyl) benzimidazole
Appearance	flowable, viscous liquid
Specific gravity	1.15 @ 25C

Advantages

- Thermally stable
- Effective
- Stable
- Non-metallic
- Toxicology

* U.S. Patent Numbers 3,017,415 and 3,370,957
EPA REG. 10445-30

CALIFORNIA PRODUCTS CORPORATION: Wood Preservatives:

Product Name:

STORM STAIN Linseed Oil Stain & Wood Preservative
214-92 Tint White Base
Solid Color
Protects against rot, mildew, fungus, moisture & UV rays

EPA Registration No. 42768-3
EPA Establishment No. 42768 MA-1

Active Ingredients	
bis (tri-n-butyltin) oxide	0.4%
FORLPET N (trichloromethylthio) phthalimide	0.7%
Inert Ingredients	96.9%
	100.0%

STORM STAIN Linseed Oil Stain & Wood Preservative
215-14 Red Cedar
Semi-Transparent
Protects against rot, mildew, fungus & moisture

EPA Registration No. 42768-3
EPA Establishment No. 42768 MA-1

Active Ingredients	
bis (tri-n-butyltin) oxide	0.4%
FORLPET N (trichloromethylthio) phthalimide	0.7%
Inert Ingredients	98.9%
	100.0%

56 Fungicides, Biocides and Preservatives

CALIFORNIA PRODUCTS CORPORATION: Wood Preservatives (Continued):

Product Name:

STORM STAIN Penetrating Wood Preservative

200-24 Clear

Protects wood against moisture, mildew, fungus & rot

Retards warping, shrinking, swelling and checking

EPA Registration No. 42768-4

EPA Establishment No. 42768 MA-1

STORM STAIN PRESERVATIVE #24 Clear

Active Ingredient:

Zinc Naphthenate 17.33% (Minimum)
(Equivalent to metallic zinc 2.2%)

Inert Ingredients: 82.67% (Maximum)

Total 100.00%

STORM STAIN Underground Wood Preservative

200-12 Green

Protects wood in soil & water against mildew, insects & rot

Ideal for foundations, sills, docks, decks, & fence posts

EPA Registration No. 42768-5

EPA Establishment No. 42768 MA-1

STORM STAIN PRESERVATIVE #12 Green

Active Ingredient:

Copper Naphthenate 21.27% (Minimum)
(Equivalent to metallic copper 2.2%)

Inert Ingredients 78.73% (Maximum)

Total 100.00%

CHAPMAN CHEMICAL CO.: CUNAPSOL-5 Water-Borne Copper Naphthenate:

Product Description

CUNAPSOL is a water borne wood preservative chemical that may be brush or spray applied for surface protection of most woods. Dip soaking or pressure impregnation of CUNAPSOL will result in deeper penetration resulting in longer preservation of treatable species. The water soluble copper in CUNAPSOL reacts with the cellulose of wood. As a result it is not easily lost from the wood by leaching. This unique formulation extends the service life of beautiful wood products by:

- Protecting the wood against attack by termites and decay.
- Controls growth of surface organisms such as mildew, mold, lichens, and moss.
- Provides an esthetically pleasing surface as is, or when admixed with tinting systems, provides a variety of colors.

CUNAPSOL also offers some distinct advantages to the applicator or treater.

- CUNAPSOL has effectively eliminated the need for and dependence on petroleum carriers.
- CUNAPSOL does not represent a fire hazard either in the concentrated form or as a ready-to-use solution.
- CUNAPSOL is non-corrosive to fasteners or treating equipment.
- CUNAPSOL treated wood is not brittle and does not more easily split because of the treatment.
- CUNAPSOL solutions are true solutions and unlike emulsions are extremely stable.
- CUNAPSOL carrier is water. When water evaporates there is no air pollution problem as with petroleum solvent.

Ingredients

Active Ingredient

Copper naphthenate 45.4%

Inert Ingredients

54.6%

* Equivalent to 5% metallic copper

Solvents

CUNAPSOL-5 contains 25% volatile organic components.

Registration

E.P.A. Reg. No. 1022-522

E.P.A. Est. No. 1022-TN-1

58 *Fungicides, Biocides and Preservatives*

CHAPMAN CHEMICAL CO.: MITROL G-ST Antimicrobial Agent:

General

MITROL G-ST Antimicrobial is Chapman Chemical Company's designation for the sodium salt of pentachlorophenol. It is available in granule form.

Adhesive manufacturers incorporate this antimicrobial into adhesives based on starch, vegetable protein, and animal protein to protect them against attack by bacteria and mold during manufacture and storage and throughout their storage life. In the leather industry, MITROL G-ST Antimicrobial plays an important role in the various pre-tanning and tanning stages of treatment, in protecting shaved and split stock during storage, and in imparting mold resistance to finished luggage leather. Stored disposable raw materials for paint are protected by the addition of MITROL G-ST or a 50-50 mixture of DOWICIDE A and MITROL G-ST Antimicrobials, and shelf preservation of protein-based latex paints is accomplished by use of the same mixture. Finished paper and fiberboard products are protected against mildew, rot and termites by use of MITROL G-ST, which also prevents deterioration of coatings, sizings and printing colors. Textile sizing and finishing solutions, printing pastes, gray goods, cloth and carpet yarn are treated with MITROL G-ST to prevent microbiological attack.

In addition, MITROL G-ST is used to control mold growth on construction materials and in petroleum drilling mud, to achieve optimum enhanced oil recovery in flooding operations by controlling microbial growth in underground strata, to inhibit fungal growth in photographic solutions, and to treat industrial cooling water.

Sales Specifications

Description	light to dark tan or gray granules
Active ingredients	90%
Sodium pentachlorophenate	79%
Sodium salts of other chlorophenols	11%
Inert Ingredients	10%

E.P.A. Registration No. 1022-527

MITROL G-ST Antimicrobial meets the requirements of a number of the Food Additive Regulations administered by the Food and Drug Administration.

CHAPMAN CHEMICAL CO.: MITROL PQ-8* for Control of Sapstain and
Mold on Wood:

Product Description

Fungicide concentrate for control of sapstain and mold in
freshly cut lumber and timber.

Ingredient Statement

Copper-8-Quinolinolate	5.4%
Inert Ingredients	94.6%
Total	100.0%

Solvents

Concentrate contains: ethanol, propylene glycol and water.

MITROL PQ-8 is miscible with water within recommended use
dilutions.

Registration

EPA Reg. No. 1022-476

EPA Est. No. 1022-TN-1

* Patent Pending

60 *Fungicides, Biocides and Preservatives*

CHAPMAN CHEMICAL CO.: MITROL PQ-15 RTU:

Product Description

MITROL PQ-15 RTU is a clear water repellent preservative designed for millwork and other wooden products. MITROL PQ-15 RTU, a prediluted product, contains the preservative copper 8-quinolinolate and is ready-to-use as received.

When applied to wood MITROL PQ-15 RTU:

Resists weathering - reduces cupping, warping and splits
Protects - from wood decay and insect attack and is toxic
to termites

Controls - disfiguring mold and stain growth

Improves - weathered wood appearance

Increases - service life

This product meets N.W.M.A. Swellograph Water Repellency requirements.

Specifications:

Meets Federal Specification TT-W-572-B, Composition D.

Registration

EPA Reg. No. 1022-491

EPA Est. No. 1022-TN-1

CHAPMAN CHEMICAL CO.: MITROL PQ-56 Antimicrobial-Preservative:

Product Description

MITROL PQ-56 is an antimicrobial and wood preservative concentrate for control of decay, stain and mold. MITROL PQ-56 also gives a protection against termites that makes it suitable for use above ground.

Wood treated with MITROL PQ-56 will display a pale green color. However, the color will fade rapidly especially on outdoor exposure.

On prolonged outdoor exposure the wood will assume a color typical for weathered wood in absence of molds and algae.

MITROL PQ-56 is essentially odor free and of low toxicity copper-8-quinolinolate is one of few wood preservative accepted by Food and Drug Administration for use in contact with food materials such as raw agricultural products.

This makes MITROL PQ-56 a product of choice for preservative application where environmental safety is of prime importance.

General Preservation

Suitable for canvas and other textiles, rope and nets, and paper products.

Ingredient Statement

Copper 8-quinolinolate	10.0%
Inert ingredients	90.0%
Total	100.0%

Solvents

MITROL PQ-56 contains propylene glycol and water.

Registration

EPA Reg. No. 1022-489
EPA Est. No. 1022-TN-1

* Patent Pending

62 Fungicides, Biocides and Preservatives

CHAPMAN CHEMICAL CO.: MITROL PQ-57:

Antimicrobial-Preservative for Control of Decay, Rot, Mold, Mildew and Microorganisms

Product Description

MITROL PQ-57 is a water dilutable concentrate for control of fungi and microorganisms on wood and other environmental surfaces.

Treatment with MITROL PQ-57 at use dilution will initially color wood slightly green. However, the color fades on outdoor exposure.

MITROL PQ-57 treated wood will acquire a light honey to silver grayish appearance on prolonged outdoor exposure, a look that is typical for weathered wood free from molds, algae, etc.

Product Safety

MITROL PQ-57 is accepted by FDA as a preservative for wood that is used or intended for use in holding, transporting or packaging of food product such as raw agricultural products.

General Preservation

Suitable for canvas and other textiles ropes and nets, leather and paper products.

Mushroom House Sanitation

Potato Ring Rot Disinfection

Ingredient Statement

Copper-8 Quinolinolate	5.0%
Inert Ingredients	95.0%
Total	100.0%

Solvents

MITROL PQ-57 contains propylene glycol and water.

Registration

EPA Reg. No. 1022-490
EPA Est. No. 1022-TN-1

* Patent Pending

CHAPMAN CHEMICAL CO.: WOODGUARD:

Why not use a regular Stain or Wood Preserving Stain instead of Woodguard?

WOODGUARD is an EPA registered wood preservative; not a stain with added preservative. One look inside the can confirms that WOODGUARD is not a typical semi-transparent stain. It smells clean! It doesn't burn the skin, and it contains the most effective, permanent preservative ingredients available. Stains will harden and skin-over...Not so with WOODGUARD! It soaks into the wood and "cures," restoring lubricity to the wood while the preservative attaches itself to the cellular structure of the wood and controls rot-causing organisms. WOODGUARD'S preservative protection is completely in solution.

How about Clear Exterior Finish Treatments?

Most of the clear finishes available don't contain preservative! It's easy to determine if they have this important feature. The can will carry an EPA registration number. A product without a registration number will not provide any long term control of decay-causing organisms.

WOODGUARD contains Copper 8 quinolinolate to control decay. This ingredient is listed on the front panel of the label. Copper 8 quinolinolate is USDA and FDA approved for use on wood in contact with food so its effectiveness and low toxicity is doubly reassuring.

EPA Reg. No. 1022-514

64 Fungicides, Biocides and Preservatives

W. A. CLEARY CHEMICAL CORP.: Fungicides:

Product Name:

3336 (TM) Turf and Ornamental Fungicide
EPA REG. No. 1001-50

Description

3336 (TM) Turf and Ornamental Fungicide is a finely ground wetttable powder containing 50% by weight of thiophanate for prevention and control of Dollar Spot, Copper Spot, Brown Patch, Red Thread, Fusarium roseum, Helminthosporium, Stripe Smut and many other diseases. It is labelled for use also on shade trees, ornamentals, herbaceous annual, perennial and bedding plants, and flower beds.

Composition

Active Ingredient:

Diethyl 4-4'-o-phenylbis-3-thioallophanate 50%

Inert Ingredient(s) 50%

Physical Data

Appearance: Finely ground powder

Solubility in Water (% By Weight): Dispersible

Odor: Slight Characteristic

% Volatile: Zero

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

3336-F Systemic Turf and Ornamental Fungicide
EPA REG. No. 1001-61

Description

3336-F Flowable Turf Fungicide is a suspension containing 4 pounds per gallon of thiophanate for prevention and control of Dollar Spot, Copper Spot, Brown Patch, Red Thread, Fusarium Roseum, Helminthosporium, Stripe Smut and many other diseases. It is labelled for use on shade trees, ornamentals, herbaceous annual, perennial and bedding plants, and flower beds.

Composition

Active Ingredient(s):	
Diethyl 4-4'-o-phenylenebis-3-thioallophanate*	42%
Inert Ingredient(s):	58%
* Equivalent to 4 lb./gal.	

Physical Data

Appearance: Off-white liquid suspension
Specific Gravity: 1.14
pH: 7
Solubility in Water(% By Weight): Dispersible
Odor: Slight Characteristic
Weight/Gallon: 9.5
Freezing Point: 32
% Volatile: 50%

W. A. CLEARY CHEMICAL CORP.: Fungicides (Continued):

Product Name:BROMOSAN
SYSTEMIC TURF FUNGICIDE

EPA REG. No. 1001-51

Description

BROMOSAN SYSTEMIC TURF FUNGICIDE is a finely ground wettable powder containing 50% wt/wt thiram plus 16.7% wt/wt Topsin E for prevention and cure associated with Dollar Spot (*Sclerotinia* ssp.), Brown Patch (*Rhizoctonia* ssp.), Snow Mold (*Fusarium*, ssp. and *Typhula*, ssp.), Copper Spot and Leaf Spot (*Helminthosporium* ssp.). It is recommended for use on golf courses, ball parks, cemeteries and all fine turf applications.

Composition

Active Ingredient(s):		Cas. No.
Thiram (tetramethylthiuram disulfide)	50.0%	137-26-8
Diethyl 4,4'-o-phenylenebis (3-thioallophanate)	16.7%	23564-06-9
Inert Ingredient(s)	33.3%	

Physical Data

Appearance:	Finely ground powder
Solubility in Water:	Dispersible
Odor:	Characteristic
% Volatile:	Zero

W. A. CLEARY CHEMICAL CORP.: Fungicides (Continued):

Product Name:BROMOSAN-F
Flowable Turf Fungicide

EPA REG. No. 1001-62

Description

BROMOSAN-F FLOWABLE TURF FUNGICIDE is a suspension containing 33.4% wt/wt thiram plus 11.6% wt/wt Topsin E for prevention of Dollar Spot (*Sclerotinia* ssp.), Brown Patch (*Rhizoctonia* ssp.), Snow Mold (*Fusarium*, ssp. and *Typhula*, ssp.), Copper Spot and Leaf Spot (*Helminthosporium* ssp.). It is recommended for use on golf courses, ball parks, cemeteries and all fine turf applications.

Composition

Active Ingredient(s):		Cas. No.
Thiram (tetramethylthiuram disulfide)	33.4%	137-26-8
Diethyl 4,4'-o-phenylenebis (3-thioallophanate)	11.6%	23564-06-9
Inert Ingredient(s):	55.0%	

Physical Data

Appearance:	Off-white liquid suspension
Specific Gravity:	1.145
pH:	7-8
Solubility in Water:	Dispersible
Odor:	Slight Characteristic
Weight/Gallon:	9.5
Freezing Point:	32F (0C)
% Volatile:	50

68 Fungicides, Biocides and Preservatives

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

CADDY
Liquid Cadmium Turf Fungicide

EPA Reg. No. 1001-10

Description

CADDY Liquid Cadmium Turf Fungicide is a water soluble liquid formulation used to control Dollar Spot and Copper Spot in golf course greens, tees, aprons, fairways and other quality turf applications. When used as directed CADDY will not injure turf-grass. The use of CADDY is prohibited in the States of Wisconsin and California.

Composition

Active Ingredient:		Cas. No.
Cadmium chloride*	20.1%	10108-64-2
Inert Ingredient(s):	79.9%	
* Equivalent to 12.3% elemental cadmium		

Physical Data

Appearance:	Colorless, clear liquid
Specific Gravity:	1.275
pH:	4-5
Solubility in Water(% By Weight):	Infinite
Odor:	Nil
Weight/Gallon:	10.6 pounds
Freezing Point:	c. 30F (-2C)
% Volatile:	79.9

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

CLEARY'S CAD-TRETE GRANULAR TURF FUNGICIDE

EPA Reg. No. 1159-182-1001

Description:

CLEARY'S CAD-TRETE GRANULAR TURF FUNGICIDE is a granular formulation used for the control of Snow Mold on lawns containing Kentucky Blue, including Merion and other strains, the various Fescues, Bents, and most other grasses. The use of CLEARY'S CAD-TRETE GRANULAR TURF FUNGICIDE is prohibited in the states of California, Connecticut and Wisconsin.

Composition

Active Ingredient(s):		Cas.No.
Thiram(tetramethylthiuram disulfide)	2.50%	137-26-8
Cadmium chloride*	0.38%	10108-64-2
Inert Ingredients	97.12%	
* Cadmium equivalent	0.22%	

Physical Data

Appearance:	Pale green granules
Solubility in Water:	c.1%
Odor:	Slight characteristic
% Volatile:	<1

70 Fungicides, Biocides and Preservatives

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

CLEARY'S GRANULAR TURF FUNGICIDE

EPA Reg. No. 1159-136-1001

Description:

CLEARY'S GRANULAR TURF FUNGICIDE is a granular formulation used for the prevention and control of Copper Spot, Dollar Spot, Leaf Spot, Brown Patch and Snow Mold on lawns containing Kentucky Blue, including Merion and other strains, the various Fescues, Bents, and most other grasses. The use of CLEARY'S GRANULAR TURF FUNGICIDE is prohibited in the states of California, Connecticut, and Wisconsin.

Composition

Active Ingredient(s):		Cas. No.
Thiram (tetramethylthiuram disulfide)	5.00%	137-26-8
Cadmium chloride*	0.75%	10108-64-2
Inert Ingredients	94.25%	
* Cadmium equivalent	0.43%	

Physical Data

Appearance:	Pale green granules
Solubility in Water:	c.1%
Odor:	Slight characteristic
% Volatile:	<1

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

PMAS
Fungicide for Winter Turf Diseases

EPA Reg. No. 1001-4

Description

PMAS Fungicide for Winter Turf Diseases is a water soluble liquid fungicide used to control snow mold ONLY on golf course greens, tees and aprons ONLY. Its use is RESTRICTED to certified applicators or persons under the direct supervision of certified golf course superintendents.

Composition

		Cas.No.
Active Ingredient: Phenylmercuric acetate	10%	62-38-4
Inert Ingredient(s):	90%	

Physical Data

Appearance:	Clear blue liquid
Specific Gravity:	1.09-1.11 @ 20C
Solubility in Water(% By Weight):	Miscible
Odor:	Slight characteristic
Weight/Gallon:	9.1 pounds
Freezing Point:	30F (-1C)
% Volatile:	about 90%

72 Fungicides, Biocides and Preservatives

W. A. CLEARY CORP.: Fungicides(Continued):

Product Name:

SPOTRETE-F
Flowable Thiram Turf Fungicide and Animal Repellent

EPA No. 1001-11

Description

SPOTRETE-F Flowable Thiram Turf Fungicide and Animal Repellent is a suspension containing 4 lbs. per gallon of thiram for prevention or control of Dollar Spot, Brown Patch, and Snow Mold. It is also labeled for use as a rabbit, rodent, and deer repellent.

Composition

Active Ingredient:		Cas. No.
THIRAM (Tetramethylthiuram disulfide)*	42%	137-26-8
Inert Ingredient(s):	58%	
* Equivalent to 4 lb/U.S. gallon or 480 g/l		

Physical Data

Appearance: Green opaque liquid suspension
Specific Gravity: 1.15
pH: 7.0-8.0
Solubility in Water (% By Weight): Water dispersible
Odor: Slight characteristic
Weight/Gallon: 9.6 lbs.
Freezing Point: approx. 32F(0C)
% Volatile: approx. 47

W. A. CLEARY CHEMICAL CORP.: Fungicides(Continued):

Product Name:

SPOTRETE 75W
Turf Fungicide

EPA Reg. No. 1001-60

Description

SPOTRETE 75W Turf Fungicide is a finely ground wettable powder containing 75% wt/wt thiram for prevention and cure associated with Dollar Spot (*Sclerotinia* ssp.), Brown Patch (*Rhizoctonia* ssp.) and Snow Mold (*Fusarium*, ssp. and *Typhula*, ssp.). It is recommended for use on golf courses, ball parks, cemeteries and all fine turf applications.

SPOTRETE 75W Turf also protects nursery stock, shrubs and ornamentals from rabbit, deer and rodent depredation.

Composition

Active Ingredient(s):	
Thiram	75%
Inert Ingredient(s)	25%

Physical Data

Appearance: Finely ground powder
Solubility in Water (% By Weight): Dispersible
Odor: Characteristic
% Volatile: Zero

74 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN 91:

E.P.A. Reg. No. 8489-24

Product: COSAN 91 is a liquid organic compound which is water soluble and recommended for use as an industrial preservative against bacterial deterioration in water-based systems such as resin emulsions, adhesives, dispersed colors, and ready-mixed joint cements.

When a product contains water, it is subject to attack by bacteria, unless a functional preservative is used at the proper concentration. COSAN 91 has been specifically designed to offer protection to susceptible raw material, as well as finished product during its service life. Suggested use levels are from 0.05% to 0.2% based on total weight of formulation. Cosan 91 is completely soluble in water and therefore does not present any difficulty in distributing itself throughout an aqueous composition. It is recommended, however, that COSAN 91 be added as soon as possible in the manufacturing process. This will assure good distribution and provide antibacterial activity to the formulation at an early stage.

To Protect

- Resin Emulsions
- Latex Adhesives
- Dispersed Colors
- Ready-mix Joint Cements

Specifications:

Active Ingredient: 2-[(Hydroxymethyl)amino] ethanol	100
Physical Form	Clear Amber Liquid
Specific Gravity (80F)	1.144-1.153
Lbs/Gal (80F)	9.5-9.6
pH	11.0+-0.5
Viscosity (Gardner) (max.)	L
Color (Gardner) (max.)	5
Solubility	Completely Soluble in Water

COSAN CHEMICAL CORPORATION: COSAN 101:

E.P.A. Reg. No. 8489-25

Product: COSAN 101 is an effective preservative for resin emulsions, latex paints, adhesives, dispersed colors, pigment slurries, and ready-mix joint cements. This product is a 77.2% aqueous solution of 4,4-dimethyloxazolidine and its trimethyl homolog. This organic molecule contains only four elements: carbon; hydrogen; oxygen; nitrogen and when used at recommended levels will prevent bacterial deterioration of water-based systems. COSAN 101 has antimicrobial activity against a broad spectrum of microorganisms.

To Protect
 Resin Emulsions
 Latex Paints
 Adhesives
 Dispersed Colors
 Ready-mix Joint Cement

Specifications:

Active Ingredients:		77.2%
4,4-dimethyloxazolidine	74.7%	
3,4,4-trimethyloxazolidine	2.5%	
Physical Appearance	Clear, Almost Colorless Liquid	
Color, Gardner	2 max.	
Specific Gravity (25/25C)	0.98-0.99	
Pounds Per Gallon	8.2	
Viscosity (25C)	app. 7.5 cp	
pH	10.5-11.5	
Freezing Point	below -20C	

76 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN 145:

E.P.A. Reg. No. 8489-26

Product: COSAN 145 is a liquid organic preservative recommended for use in resin emulsions, latex paint, adhesives, dispersed colors, pigment slurries, and ready-mix joint cements. COSAN 145 contains 50% active ingredient and, when used at recommended levels, will provide antimicrobial activity to a water-based system. By preventing bacterial deterioration and the associated problems of viscosity loss, gas production, off-odors, discoloration, and coagulation, the protected composition has increased shelf life and improved product performance.

COSAN 145 offers the following advantages

- non-yellowing
- is a mobile 50% aqueous solution
- does not discolor in conjunction with organic mildewcides
- is not temperature sensitive and can be added at any point during manufacture
- will not adversely affect physical properties of the final formulation in the wet or dry state
- has a high flash point and a low freezing point which makes storage and handling easy and trouble-free

COSAN 145 has antimicrobial activity against a broad spectrum of microorganisms.

To Protect

Resin Emulsions
Latex Paints
Building Adhesives
Dispersed Colors
Ready-mix Joint Cements

Specifications:

Active Ingredient:

Methanol [[2-(dihydro-5-methyl-3(2H)-oxazolyl)-1-methylethoxy]methoxy]methoxy]

50%

Physical Appearance

clear liquid

Color, Gardner

4 max.

Specific Gravity (25/25C)

1.075-1.085

Pounds Per Gallon

8.95-9.04

Viscosity (25C)

Gardner A-4

pH

8.5-9.0

Freezing Point

<-15C

Flash Point

214F

COSAN CHEMICAL CORPORATION: COSAN 158:

E.P.A. Reg. No. 8489-21

Product Description: COSAN 158 is a yellow liquid of low viscosity which has been designed to insure preservation against in-can bacterial attack as well as providing the necessary antifungal ingredient for mildew resistance of the applied coating.

Applications: COSAN 158 should be considered for the following end uses: ready mixed joint cements and spackling compounds, where the control of both bacterial and fungi are required.

Specifications:

Active Content:	
Tributyltin benzoate	15%
Alkyl (derived from fatty acids of coconut oil*) Amine hydrochlorides	
(*5.0% Caprylyl, 7.0% Capryl, 56.0% Lauryl, 18.0% Myristyl, 7.0% Palmityl, 5.0% Stearyl, 2.0% Linoleyl)	21.2%
Physical form	Liquid
Gardner Color Max	6
Specific gravity	0.940-0.960
Pounds/Gallon	7.3-8.0

78 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN 265:

E.P.A. Reg. No. 8489-23

Product: COSAN 265 is a 45% concentration of 1.1'-(2-Butenylene) bis(3,5,7-triaza-1-azoniaadamantane chloride), which is completely soluble in water. This organic preservative, when used at the recommended levels, will prevent bacterial deterioration of water-based systems.

To Protect

Latex Paints
Resin Emulsions
Latex Adhesives
Dispersed Colors
Ready-mix Joint Cements

Specifications:

Active Ingredient: 1.1'-(Butenylene) bis (3,5,7-triazon-
iaadamantane chloride) 45%
Form: Free Flowing Powder
Particle Size: 99% through 325 Mesh Screen
Bulking Value: Approximately 21.3 Lbs. per Cu.Ft.
Decomposition Point: 150C
pH (2% Water Solution): 7.5
Color Light Tan

COSAN CHEMICAL CORPORATION: COSAN 635-W:

E.P.A. Reg. No. 8489-13

Product: COSAN 635-W is a complexed alkyl amine suggested for use as an antibacterial agent in water containing compositions such as adhesives, paints and their components, to impart package stability. COSAN 635-W is formulated as an easy to handle water solution.

Use: COSAN 635-W will provide stability to bacterial attack for susceptible water and emulsion compositions. These may include resin emulsions such as polyvinyl acetate, acrylic, polyvinyl acetate-ethylene copolymer and vinyl acrylic types.

Specifications:

Active Content	25%
Alkyl Amine(5.0% Caprylyl, 7.0% Capryl, 56.0% Lauryl, 18.0% Myristyl, 7.0% Palmityl, 5.0% Stearyl, 2.0% Linoleyl) hydrochlorides	
Physical form	Liquid
Specific gravity	.950-.960
Pounds/gallon	7.9-8.0
pH	6.8-7.2
Color	Gardner 3 Max.
Freezing	Solidifies at 0C

80 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN JTA-20:

E.P.A. Reg. No. 8489-3

Product: COSAN JTA-20 is a highly functional, soluble, phenylmercury acetate which has been deposited on an inert, synthetic, hydrous calcium silicate to produce a free-flowing, relatively non-dusting powder which is simple to incorporate into dry formulations. COSAN JTA-20 contains 20% phenylmercury acetate as the active ingredient equivalent to 12% mercury expressed as metal.

Suggested End Uses: When a product contains water or is ultimately applied by dispersion in water, it is subject to attack by bacteria unless a functional preservative is used at the proper concentration. Joint cements, acoustical plaster, textures, adhesives and other powdered products are commonly applied out of water solutions or dispersions. One of the major problems in the use of these products is microbial spoilage. COSAN JTA-20 has been specifically formulated as a preservative for the protection of these compositions without bringing about commonly encountered undesirable side reactions.

COSAN JTA-20 offers:

1. Immediate preservation upon wetting of the formulation which is to be protected.
2. Immediate solution in water since the active ingredient, phenylmercuric acetate, is present in its soluble state. This minimizes the opportunity for entrapment of undissolved particles which ultimately could result in pockmarks.
3. Elimination of the danger of photographing of joints and nail heads, yellowing and browning, since it is non-phenolic.

Specifications:

Phenylmercury Acetate, minimum	20%
Mercury Metal Content, minimum	12%
Particle Size (average)	2.1 microns
Bulk Density	2.8 lbs. per gal.
Appearance	Fine, free-flowing, white powder

COSAN CHEMICAL CORPORATION: COSAN JTA-46:

E.P.A. Reg. No. 8489-27

Product: COSAN JTA-46 is a highly functional product which has been deposited on an inert synthetic hydrous calcium silicate to produce a free flowing powder which is simple to incorporate into dry formulations. COSAN JTA-46 contains 1,1'-(2-Butenylene) bis (3,5,5-triaza-1-azoniaadamantane chloride) and Tributyltin salicylate as the active ingredients. This product has been designed to insure preservation against in-can bacterial attack as well as providing the necessary antifungal ingredient for mildew resistance of the applied coating.

Suggested End Uses: When a product contains water, or is ultimately applied by dispersion in water, it is subject to attack by bacteria unless a functional preservative is used at the proper concentration. COSAN JTA-46 is recommended for use in joint cements, acoustical plasters, texture-finished paint, building adhesives and other powdered products which are commonly applied out of water solutions or dispersions. One of the major problems in the use of these products is microbial spoilage. COSAN JTA-46 has been specifically formulated as a preservative for the protection of these compositions without bringing about commonly encountered undesirable side effects. In addition, control of fungi where required will be provided in order to mitigate the problems associated with mildew defacement. COSAN JTA-46 offers immediate preservation upon wetting of the formulation which is to be protected.

Specifications:

1,1'-(2-Butenylene) bis (3,5,7-triaza-1-azoniaadamantane chloride)	37.1%
Tributyltin salicylate (Tin as Metal....2.27%)	8.4%
Particle Size (average)	2.1 microns
Bulk Density	3.3 Pounds Per Gallon
Appearance	Free-Flowing Yellow Powder

82 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN P:

E.P.A. Reg. No. 476-2040-8489

Folpet N-(Trichloromethyl) Thiophthalimide
(U.S. Patent No. 2,553,770)

AIR MILLED

Product: COSAN P is an off-white, organic compound of relatively high activity against a broad spectrum of fungi. COSAN P is recommended as a mildew inhibitor in oil based paints. COSAN P's low order of toxicity makes it well suited for use in food plants, dairies and breweries.

COSAN P is an excellent microbiocide for use in general vinyl applications such as wall coverings, upholstery, awnings and similar applications. It is heat stable under most conditions of use and compatible with most commercial formulations.

Use: Different coating formulations vary widely in their innate mildew resistance.

Where to Use: COSAN P, is an almost insoluble powder and should be handled as a pigment. Due to its fine particle size, COSAN P may be added as the last ingredient in the pigment grind dispersion.

Specifications:

Folpet N-(trichloromethyl) Thiophthalimide (minimum)	88%
Color	Off-White
Odor	Distinct but non-offensive
Particle Size	10 microns-avg.
Bulking Value	13.4 lbs./gal. 0.0746 gal./lbs.

COSAN CHEMICAL CORPORATION: COSAN PCMC:

Parachlorometacresol
E.P.A. Reg. No. 8489-7

Product: Parachlorometacresol is a high purity chemical suggested as a preservative against bacterial deterioration for industrial water based compositions, such as adhesives, joint cements and latex emulsions to impart package stability.

Use: In actual use, the specific concentration of COSAN PCMC will vary with the composition to be protected. COSAN PCMC will protect and preserve raw materials and finished products at use concentrations of 0.05% to 0.25% based on the total weight of the composition. When used at recommended levels, COSAN PCMC will remain effective in the unopened can or package and throughout the formulations useful service life. Good operating procedures should require the incorporation of this preservative early in the manufacturing process. The point of addition will vary with the process being conducted.

To Protect
Adhesives
Joint Cements
Latex Emulsion

Specifications:

Active content (minimum purity 99%)	100%
Physical form	crystalline solid
Boiling Point (760 mm)	230.5C
Boiling Point (10 mm)	111.0C
Melting Point	63-64C
Specific gravity	1.215
Apparent density	loose 0.887
Stamped	0.912

84 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN PMA-30:

E.P.A. Reg. No. 8489-2

Product: COSAN PMA-30 is a solubilized phenylmercuric acetate formulation which has earned acceptance as the highly effective standard in the industry for protecting liquid emulsion systems and films. COSAN PMA-30 is water soluble and compatible with styrene-butadiene, acrylic, vinyl-acrylic, polyvinyl acetate, oil and alkyd modified systems. COSAN PMA-30 will not adversely affect freeze-thaw stability, whites and light tints.

Need: In the preparation and handling of emulsion paints, three basic microbiological problems may exist:

1. Viscosity loss in the finished paint as a result of inadequately protected raw materials or intermediates. Dispersed colors, latexes, dispersants, thickening solutions and the like are all susceptible and are frequently contaminated.
2. Package stability of liquid paint. Unprotected or inadequately protected aqueous systems are highly susceptible to attack by bacteria and/or fungi. The presence of these microorganisms for even a short time may result in viscosity loss, emulsion break, gas formation, putrefaction, excessive settling, etc.
3. Mildew susceptibility of the dry film. In geographic areas other than desert, adequate moisture is usually available to support fungal (mildew) growth. Unsightly discoloration, premature or excessive chalking, and the like can result.

Adequate protection of finished product and susceptible raw materials in all stages of production is absolutely essential.

Specifications:

Phenylmercuric acetate, minimum	30%
Metal content, minimum	Mercury, 18.0%
Specific gravity	1.30-1.32
Pounds per gallon	10.8-11.0
Maximum Color	4 (Gardner)
Viscosity/25 C Brookfield	66 cps/100 rpm, #2 spindle
pH	7.5-8.5
Flash Point	>240F Closed cup
Vapor pressure	3mm Hg/25C.

COSAN CHEMICAL CORPORATION: COSAN PMA-100:

E.P.A. Reg. No. 8489-5

Product: COSAN PMA-100 is dry phenylmercuric acetate of uniform high quality containing 59.6% mercury, expressed as metal. It is compatible with styrene-butadiene, acrylic, vinyl-acrylic, polyvinyl acetate, oil and alkyd modified latex paints. COSAN PMA-100 will not adversely affect: pigment dispersion, color acceptance, color retention, gloss, or freeze-thaw stability. COSAN PMA-100 has a uniformly small particle size and may be used in semi-gloss and gloss latex paints without affecting the film's glass like appearance.

Need: In the preparation and handling of emulsion systems, three basic microbiological problems may exist:

1. Viscosity loss in the finished system as a result of inadequately protected raw materials or intermediates. Dispersed colors, latices, dispersants, thickening solutions and the like are all susceptible.
2. Package stability of liquid systems. Unprotected or inadequately protected aqueous systems are highly susceptible to attack by bacteria and/or fungi. The presence of these microorganisms for even a short time may result in viscosity loss, emulsion break, gas formation, putrefaction, excessive settling, etc.
3. Mildew susceptibility of the dry film. In geographic areas other than desert, adequate moisture is usually available to support fungal (mildew) growth. Unsightly discoloration, premature or excessive chalking and the like can result.

Adequate protection of finished product and of the susceptible raw materials in all stages of production is absolutely essential.

Specifications:

Active Ingredient	Phenylmercuric Acetate
% Active	100%
Mercury Content: Calculated	59.6%
Typical	59.5-60.0%
Appearance	Free-flowing white powder
Melting Point	149C(Typical)
Bulking value	0.05 gal/lb.
Particle Size	95% <75 microns

86 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COSAN PMO-30:

E.P.A. Reg. No. 8489-1

Product: Chemically COSAN PMO-30 is a 30% solution of phenylmercuric oleate, which has the longest history of successful antimicrobial performance in the coatings industry. COSAN PMO-30 is manufactured to strict specifications, to assure optimum mildew-resistance/preservative characteristics.

COSAN PMO-30 can only be used in latex paints and other water emulsion compositions. COSAN PMO-30 is compatible with latex systems and will not adversely effect freeze-thaw stability, or tints.

Use: The innate mildew resistance of different paint formulations varies widely. A generally satisfactory level is approximately 5 pounds COSAN PMO-30 per 100 gallons finished formula. Higher or lower levels may be indicated on the basis of formulation and/or end use.

Specifications:

Phenylmercuric oleate minimum	30%
Metal content, minimum	11.0%
Specific gravity	0.910-0.940
Pounds per gallon	7.58-7.83
Flash point minimum(Tag Closed Cup-ASTM D-56)	100F.
Maximum Viscosity	A2 (Gardner)

COSAN CHEMICAL CORPORATION: COSAN S:

E.P.A. Reg. No. 8489-4

Product: A non-metallic, organic chemical, COSAN S is a highly effective anti-microbial preservative for water systems including adhesives, dispersed colors, protein colloids, and resin emulsions.

Usually stable in high pH ranges, pH 8.0 and above, COSAN S will ordinarily provide protection against recontamination. Since the stability of COSAN S decreases as the pH declines, durability of protection against recontamination will not extend more than 3 to 6 months in formulations at pH 6 or below.

Use: For package stability of water-containing materials, it is recommended that a concentration of 0.1% of the total weight of the formulation of COSAN S be used. Some formulations may require up to 0.25% by weight.

COSAN S has a slight, distinctive odor, which is not usually detectable in products containing recommended levels.

Where to Use: Since all systems based on water are potentially subject to microbial attack, it is important that COSAN S be blended in at the time water is first introduced into the batch. If cooking or extended periods at elevated temperatures are used, the addition of COSAN S should be delayed until the temperature is at practical minimum.

Active Ingredient, minimum, (3,5-dimethyltetrahydro 1,3,5,2H-thiadiazine-2 thione)	95%
Pounds per gallon (net)	11.6
Appearance	white crystalline powder
Melting Point	99.5C
Flash Point (open cup)	280F

88 Fungicides, Biocides and Preservatives

COSAN CHEMICAL CORPORATION: COTIN 234:

E.P.A. Reg. No. 8589-8

Product: COTIN 234 is a formulated solution of a triorganotin salt which has a high degree of antifungal activity. COTIN 234 exhibits mildew resistance/preservative activity in a great variety of materials and formulations and due to its unique formulation offers excellent compatibility in latex and other water emulsion formulations. COTIN 234 can be used where mercury containing preservatives have been omitted either due to the general toxicological picture, or for elimination of sulfide staining characteristics.

Specifications:

Tributyltin salicylate	48%
(Tin as Metal.....13%)	
Specific gravity	1.09-1.10
Pounds per gallon	9.07-9.16
Flash point minimum (COC)	204C(400F)
Maximum color	3 (Gardner)
Maximum viscosity	47 cp @ 20C

COSAN CHEMICAL CORPORATION: COTIN 300:

E.P.A. Reg. No. 2749-119-8489

Product: COTIN 300 is a colorless to light yellow liquid which is highly effective against gram positive bacteria and fungi. Broad spectrum antimicrobial activity may be achieved by combination with quaternary ammonium compounds, organo-mercurials, etc.

Applications: COTIN 300 is recommended for use in:

- Marine antifouling paints
- As a fungicide in emulsion paints
- For use in cooling towers
- In secondary oil recovery
- As a textile sanitizer
- In adhesive preservation
- In marine and terrestrial wood preservation
- Other applications where antimicrobial activity is required

Specifications:

Bis (tributyltin) oxide	97.4% minimum
Tin content	39-40%
Physical form	colorless to light yellow liquid
Specific gravity	1.17

90 Fungicides, Biocides and Preservatives

DEXOL INDUSTRIES: DEXOL ACTI-DIONE PM Rose Fungicide:

Controls:

- Powdery Mildew and Rust on Roses
- Powdery Mildew on Certain Other Ornamentals

Active Ingredients:

Cycloheximide 0.027% w/w
(3-[2-(3,5-dimethyl-2-oxocyclohexyl)-2-hydroxyethyl]-
glutarimide)

Inert Ingredients: 99.973% w/w
Total 100.000% w/w

EPA Reg. No. 192-137

EPA Est. 192-CA-1

Sales Points

- Prevents and eradicates Powdery Mildew on roses and other ornamentals.
- Broad-spectrum fungicide.
- Wettable powder.
- No visible residue.
- Compatible with other insecticides.
- Low dilution rates.
- Built in spreader sticker.
- Safe to beneficial bacteria.
- No known resistance buildup.
- Kills fungus on contact.

DEXOL INDUSTRIES: DEXOL BENOMYL Systemic Fungicide:

For control of certain fungal diseases of ornamentals, roses (Powdery Mildew and Black Spot), fruits, vegetables and lawn grasses.

Active Ingredients: % by Wt.:

Benomyl (Methyl 1-(butylcarbomoyl)-2-benzimidazolecarbamate) 50%

Inert Ingredients: 50%

Total: 100%

EPA Reg. No. 192-127

EPA Est. 192-CA-1

Sales Points

- Easy to apply.
- Can be used on fruits, vegetables, ornamentals, flowers, roses and lawns.
- Systemic action won't wash off.
- Controls and prevents mildew and fungus caused by over-watering.
- Controls Powdery Mildew and Black Spot on roses.

92 Fungicides, Biocides and Preservatives

DEXOL INDUSTRIES: DEXOL Bordeaux Mixture:

Disease control use on:

- Fruits
- Vegetables
- Trees
- Shrubs
- Evergreens

Active Ingredient: By Weight

Copper, expressed as metallic copper 12.75%

Inert Ingredients: 87.25%

Total: 100.00%

EPA Reg. No. 904-166-192

EPA Est. No. 192-CA-1

Sales Points

- A complete Bordeaux mix.
- Use on fruits and vegetables as well as ornamentals.
- Controls Anthracnose, Black Rot, Leaf Spot, Early and Late Blight, Downey Mildew.
- Contains copper-lime coomplex.

DEXOL INDUSTRIES: DEXOL Maneb Garden Fungicide:

Controls many plant disease fungi on vegetables, fruits, ornamentals and turf.

Active Ingredient

Maneb [Manganese ethylene bisdithiocarbamate] 80.0%
[Manganese equivalent as metallic 16.5%]

Inert Ingredients 20.0%
Total 100.0%

EPA Reg. No. 192-125

EPA Est. 192-CA-1

Sales Points

- Controls Blight, Anthracnose, Leaf Spot
- Excellent for disease on tomatoes, vegetables and fruits.
- New moisture proof plastic container.
- 80% wettable powder.
- 6 oz. - makes 24 gal. of spray.

94 Fungicides, Biocides and Preservatives

DEXOL INDUSTRIES: DEXOL THIRAM PLUS Lawn Fungicide Contains ACTI-DIONE:

Prevents and Controls Dollarspot, Brown Patch, Powdery Mildew, Rust, Snow Mold, and Other Fungus Diseases on Major Turf Grasses

Active Ingredients:

Cycloheximide	0.75% w/w
(3-[2-(3,5-dimethyl-2-oxocyclohexyl)-2-hydroxyethyl]-glutarimide)	

Thiram (tetramethylthiuram disulfide)	75.00% w/w
---------------------------------------	------------

Inert Ingredients:	24.25% w/w
Total	100.00% w/w

EPA Reg. No. 192-138

EPA Est. 192-CA-1

Sales Points

- Broad spectrum fungicide: controls nine (9) major turfgrass diseases.
- Low dosage rates.
- Wettable powder.
- Controls and prevents disease.
- Product compatibility.

DEXOL INDUSTRIES: DEXOL ZINEB Garden Fungicide:

Controls diseases on vegetables, fruits and ornamentals.

Active Ingredient

ZINEB (zinc ethylene bisdithiocarbamate)
(Metallic zinc equivalent 17.7%)

75.0%

Inert Ingredients

25.0%

Total

100.0%

EPA Est. 192-CA-1

EPA Reg. No. 707-2-192

Sales Points

- Recommended by many State Agricultural Services.
- Controls Anthracnose, Early and Late Blight, Downey Mildew, Rust and certain other diseases.
- Use on Vegetables - Beans, Cucumbers, Tomatoes, Cabbage, Carrots, Cauliflower, Peppers, Lettuce and others.
- Use on Fruits and Nuts - Apples, Citrus, Pecans, Peaches and others.
- Use on Lawns, Ornamentals, Trees, Roses and Flowers.

96 Fungicides, Biocides and Preservatives

DIAMOND SHAMROCK CHEMICALS CO.: NOPCOCIDE Fungicides:

Product Name:

NOPCOCIDE N-40-D:

Fungicide for Mildew Control on Paint Film

NOPCOCIDE N-40-D is a broad-spectrum fungicide for control of mildew on paint film. The flowable form of NOPCOCIDE N-96 provides excellent performance characteristics when used as a mildewcide in aqueous paint systems only.

Typical Properties

Appearance	Viscous, gray liquid
Active content, %	40.4
Active Ingredient	Tetrachloroisophthalonitrile*
Molecular Weight	265.9

* U.S. Patents 3,290,353; 3,331,735 and 3,948,636

EPA Reg. No. 50534-115-2204

NOPCOCIDE N-96:

Fungicide for Manufacturing Use to Control Mildew on Paint Film

NOPCOCIDE N-96 is a broad spectrum microbiocide for control of fungi. Its high degree of activity provides excellent performance characteristics for use as a mildewcide in--

- latex exterior and interior emulsion paints.
- solvent-based paints at levels of 5-12 pounds per 100 gallons.

NOPCOCIDE N-96 has several desirable properties which are important in manufacturing fungus resistant paint:

- extremely low water solubility
- low vapor pressure
- fine particle size
- excellent pH stability

Typical Properties

Chemical	Tetrachloroisophthalonitrile*
Active Content, %	96
Molecular Weight	265.9

* U.S. Patents 3,290,353 and 3,331,735

EPA Reg. No. 50534-114-2204

DIAMOND SHAMROCK CHEMICALS CO.: NOPCOCIDE Fungicides (Continued):

Product Name:

NOPCOCIDE N-96-S:
Fungicide and Marine Antifoulant

NOPCOCIDE N-96-S is a broad spectrum fungicide and marine antifouling agent. It can be used by the protective coatings industry in manufacturing mildew resistant paints and stains and in manufacturing antifouling marine coatings.

Technical Data

Composition	Tetrachloroisophthalonitrile
Active content, %	96
Physical state	3-5 micron micromilled powder

Applications

Major applications in protective coatings are:

- Control mould growth on aqueous or solvent based exterior paints.
- Control mould growth on aqueous or solvent based stains.
- Prevent fungal growth on masonry paints.
- Prevent fouling of marine coatings by algae, barnacles, tubeworms, mussels, hydroids, tunicates and bryozoans.

NOPCOCIDE N-96-S has several desirable properties for use in these applications:

- Low order of toxicity.
- Hydrolytic stability.
- Extremely low water solubility for better control of leaching rates.
- Low vapour pressure.
- Fine particle size allowing higher loading than with liquids.
- pH stability.
- Stable to UV radiation.

EPA Registration No. 50534-117-2204

98 *Fungicides, Biocides and Preservatives*

DOW CHEMICAL U.S.A.: DBNPA 2,2-Dibromo-3-Nitrilopropionamide:

Broad Spectrum, Low Persistency Biocide

The DBNPA family of antimicrobials is formulated with a unique, brominated chemical developed by The Dow Chemical Company to provide: (1) broad spectrum control of bacteria, yeast, fungi, slime, and algae at low treatment levels; and (2) rapid decomposition in aquatic environments.

Two biocides are currently available: DOW Antimicrobial 7287 and DOW Antimicrobial 8536. They are 20% and 5% active formulations (respectively) of 2,2-dibromo-3-nitrilopropionamide (DBNPA). These industrial antimicrobials are registered by the Environmental Protection Agency (EPA) for specific end-uses.

Both DOW Antimicrobial 7287 and DOW Antimicrobial 8536 meet the requirements of the Food and Drug Administration (FDA) for use as a slimeicide in the manufacture of paper and paperboard intended to contact food.

The 7287 and 8536 products also are authorized for use under the United States Department of Agriculture meat, poultry, rabbit, and egg products inspection programs.

DOW Antimicrobial 7287 and DOW Antimicrobial 8536

For control of bacteria, fungi, and yeasts in paper mills, metalworking fluids containing water, and in enhanced oil recovery systems; for control of bacteria, fungi and algae in industrial recirculating water cooling towers and once-through fresh and sea water industrial cooling water systems; for control of slime forming bacteria and fungi in air washer systems.

The active ingredient (DBNPA) in both formulations has been tested extensively in field installations and is generally compatible with paper mill and cooling water systems, commonly used metal-working fluids, and enhanced oil recovery systems.

DOW Antimicrobial 7287: EPA Reg. No. 464-426

DOW Antimicrobial 8536: EPA Reg. No. 464-496

DOW CHEMICAL U.S.A.: DOWICIDE 1 Antimicrobial:

General

DOWICIDE 1 Antimicrobial is readily soluble in most organic solvents and oils, and is only slightly soluble in water. Usually it is added to formulation concentrates which are subsequently diluted with water during use. DOWICIDE 1 antimicrobial can be formulated with the aid of anionic emulsifiers as well. However, it is usually incompatible with most other types of surfactants and emulsifiers.

DOWICIDE 1 Antimicrobial is Dow's designation for o-phenylphenol.

Physical Properties

Molecular weight	170.2
Freezing point, C	57
Boiling point, C	286
Flash Point, F, C.O.C.	255
Fire Point, F, C.O.C.	300
Specific Gravity, 25/25C	1.2
Bulk density, lb/cu ft	35-41

Sales Specifications

Description	White or light buff to pink free-flowing flakes
Active ingredient, o-phenylphenol	99%
Inert ingredients	1%

E.P.A. Registration No. 464-70

Listed in the "USDA Compilation of Registered Uses of Fungicides and Nematocides"

Meets the requirements of the F.D.A.

DOW CHEMICAL U.S.A.: DOWICIL 75 Preservative:

Highly reliable, cost-effective antimicrobial protection for water-based formulations

DOWICIL 75 Preservative offers an excellent combination of properties for preserving aqueous solutions

DOWICIL 75 Preservative is the designation for 1-(3-chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride combined with a stabilizer (sodium bicarbonate). It is designed to provide highly effective anti-microbial activity in aqueous formulations, including adhesives, paints, construction materials, latexes, and detergents, to name just a few.

- Effective at low concentrations
DOWICIL 75 provides highly effective antimicrobial activity at low concentrations--typically 0.01 to 0.27% by weight in formulations.
- Broad-spectrum activity
A formulation preserved with DOWICIL 75 is protected against a wide variety of bacteria and fungi.
- Excellent formulation compatibility
DOWICIL 75 has been shown to be compatible with many formulation systems.
- Cost-effective
Because it provides highly effective antimicrobial activity at low concentrations, DOWICIL 75 is one of the most cost-effective aqueous system preservatives available.
- High water solubility
Because spoilage microorganisms must have water for metabolic processes, they will thrive only in the aqueous phase of a formulation. DOWICIL 75 Preservative is highly soluble in water.
- Wide pH latitude
Most microorganisms require an environment with a pH between 5 and 9. The anti-microbial activity of DOWICIL 75 has been demonstrated in formulations with a pH ranging from 2 to 12.5.

The E.P.A. registration number of DOWICIL 75 Preservative is 464-403.

102 Fungicides, Biocides and Preservatives

DUPONT: Agricultural Products:

Product Name:

BENLATE Fungicide Wettable Powder

Active Ingredient:

Benomyl [Methyl I-(butylcarbamoyl)-2-benzimidazolecarb-
amate] 50%

Inert Ingredients: 50%

U.S. Pats. 3,541,213 & 3,631,176

EPA Reg. No. 352-354

BENLATE PNW Fungicide Wettable Powder

Active Ingredient:

Benomyl [Methyl I-(butylcarbamoyl)-2-benzimidazolecarb-
amate] 50%

Inert Ingredients: 50%

U.S. Pats. 3,541,213 & 3,631,176

EPA Reg. No. 352-434

MANZATE 200 Fungicide Wettable Powder

Active Ingredient:

A coordination product of zinc ion and manganese ethylene
bisdithiocarbamate 80%

in which the ingredients are

Manganese++

16%

Zinc++

2%

Ethylene bisdithiocarbamate ion (C₄H₆N₂S₄)⁺

62%

Inert Ingredients 20%

EPA Reg. No. 352-341

DUPONT: Agricultural Products(Continued):

Product Name:

MANZATE 200 Flowable Fungicide Liquid Suspension

Contains 4.0 Lbs. Active Per Gallon

Active Ingredient:

A coordination product of zinc ion and manganese ethylenebisdithiocarbamate in which the ingredients are	37.0%
Manganese++	7.4%
Zinc++	0.9%
Ethylenebisdithiocarbamate ion (C4H6N2S4)	28.7%

Inert Ingredients	63.0%
-------------------	-------

U.S. Pat. 3,379,610
EPA Reg. No. 352-398

TERSAN 1991 Fungicide Wettable Powder

Active Ingredient:

Benomyl [Methyl 1-(butylcarbamoyl)-2-benzimidazole-carbamate]	50%
---	-----

Inert Ingredients	50%
-------------------	-----

U.S. Pats 3,541,213 & 3,631,716
EPA Reg. No. 352-357

TERSAN LSR Fungicide Wettable Powder

Active Ingredient:

A coordination product of zinc ion and manganese ethylene bisdithiocarbamate in which the ingredients are	80%
Manganese++	16%
Zinc++	2%
Ethylene bisdithiocarbamate ion (C4H6N2S4)+	62%

Inert Ingredients	20%
-------------------	-----

U.S. Pat. 3,379,610
EPA Reg. No. 352-343

104 Fungicides, Biocides and Preservatives

EASTERN COLOR & CHEMICAL COMPANY: ECCO MP-170-CONC:

Classification: A solvent soluble mildew and rotproofing agent containing 2,2'-methylene-bis (4-chlorophenol) (G-4).

Properties:

Appearance	- Tan waxy solid
Solubility	- 10% solution in aliphatic solvents to form a slightly hazy solution
Active Content	- 16.3% (G-4)
Density	- 7.2 lbs/gallon

General Comments:

ECCO MP-170-CONC is a solvent soluble mildewproofing agent containing 16.3% G-4 together with added wax components which contribute substantially to water repellency and improved dynamic water absorption properties.

The solvent normally used to prepare these solutions is aliphatic in nature such as (Amsco 46, Varsol #2, or Mineral Spirits). The concentration of application bath will vary with the percent wet pick-up and the requirements for G-4 content on the finished fabric.

EPA Reg #6009-3

EPA Est #6009-RI

Active Ingredient:

2,2-Methylenebis (4-Chlorophenol) 16.3%

Inert Ingredient: 83.7%

Total 100.0%

EASTERN COLOR & CHEMICAL COMPANY: ECCO MP-400:

Classification: Aqueous sodium salt of 2,2'-methylenebis-(4-chlorophenol), solution.

Properties:

Appearance	- clear, deep ruby colored liquid
pH (5% sol'n)	- 9.5+-0.5
Active Content	- 35% G-4 as sodium salt
Solubility	- readily soluble in water
Density	- 9.3 lbs/gallon

General Comments:

ECCO MP-400 is a water soluble, sodium salt of 2,2'-methylenebis (4-chlorophenol) more commonly identified as G-4.

This product will provide good mildew-proofing protection when applied from a padding solution.

EPA Reg #6009-6

EPA Est #6009-RI

Active Ingredient:

2,2-Methylenebis (4-Chlorophenol), Sodium Salt	35.1%
--	-------

Inert Ingredient:

Total	64.9%
-------	-------

	100.0%
--	--------

106 Fungicides, Biocides and Preservatives

EASTERN COLOR & CHEMICAL COMPANY: ECCO MP-2004:

Classification: A mildew and rotproofing emulsion containing 2,2'-methylenebis (4-chlorophenol).

Properties:

Appearance	- Slightly viscous stable white emulsion
pH (2% solution)	- 5.5+-0.3
Active Content	- 20% minimum (chlorinated phenylmethane)
Solubility	- Readily soluble in water at 100-120F.
Stability	- Stable under normal conditions. Must be protected from freezing.
Density	- 8.50 lbs/gallon

General Comments:

ECCO MP-2004 is a newly developed mildewproof emulsion designed to be compatible with a variety of water repellents for a single bath treatment of textiles.

The 2,2'-methylenebis (4-chlorophenol) active material is a well established and accepted fungicide for this type of application and is required in a great many U.S. government and foreign government specifications for treating military textiles.

EPA Reg. #6009-8

EPA Est. #6009-R1

Active Ingredient:

2,2-Methylenebis (4-Chlorophenol)	20.0%
-----------------------------------	-------

Inert Ingredient:

Total	80.0%
-------	-------

	100.0%
--	--------

EASTERN COLOR & CHEMICAL COMPANY: ECCOCIDE CW CONC.:

Classification: Solvent soluble copper-8-hydroxy-quinoline with water repellent waxes.

Properties:

- | | |
|-------------|---|
| Appearance | - Dark-brownish green waxy paste |
| Solubility | - Completely soluble in aliphatic hydrocarbon solvents to give a clear dark green solution. |
| % Copper | - 1.80% Minimum |
| Wax Content | - 35.0% Minimum |

General Comments:

ECCOCIDE CW CONC is a solvent soluble copper-8-hydroxy-quinoline material, compounded with water repellent materials. The active concentrations are such as to provide the necessary mildew-proofing protection and resistance to water absorption as required in various military specifications as well as non-military applications.

Solutions of ECCOCIDE CW CONC can be readily prepared for padding with aliphatic hydrocarbon solvents.

EPA Reg # 6009-6
EPA Est # 6009-RI

Active Ingredient:	
Copper-8-Quinolinolate	10.0%
Inert Ingredient:	90.0%
Total	100.0%

108 *Fungicides, Biocides and Preservatives*

FMC CORPORATION: FUNGINEX 1.6 EC Fungicide:

EPA Reg. No. 21137-4-279

EPA Est. 279-

Active Ingredient:

Triforine (N, N'-[1,4-piperazinediyl-bis-(2,2,2-trichloro-
ethylidene)]-bis-[formamide]) 18.2%

Inert Ingredients: 81.8%

100.0%

This product contains 1.6 lb. of Triforine per gallon.

GREAT LAKES CHEMICAL CORP.: BROMICIDE Microbiocide:

BROMICIDE Microbiocide for Water Treatment

BROMICIDE, Great Lakes Chemical Corporation's registered trademark for bromochlorodimethylhydantoin, effectively controls undesirable growth of biofouling organisms in water. The broad selection of BROMICIDE product forms and feed equipment produces a powerful chemical tool for optimal maintenance of industrial water systems.

Use of bromochlorodimethylhydantoin is a time proven technology for disinfection of recreational waters such as swimming pools and spa water. Recently, BROMICIDE has proven successful in many diverse industrial water treatment applications.

Applications

BROMICIDE is registered for use in the following applications by the United States Environmental Protection Agency:

- Commercial and industrial recirculating cooling towers
- Once-through cooling systems
- Air washers equipped with mist eliminators
- Brewery pasteurizers
- Influent water systems
- Ponds and lagoons
- Industrial water scrubbing systems

EPA Reg. No. 5785-57

110 *Fungicides, Biocides and Preservatives*

GRIFFIN CORP.: Fungicides:

Product Name:

BASICOP

Basic Copper Sulfate Wettable Powder Agricultural Fungicide

- Controls many fungal and bacterial diseases on a wide range of crops

BASICOP is a wettable powder formulation containing 53% basic copper sulfate. BASICOP is a highly active contact fungicide giving commercially acceptable control of a wide range of plant diseases

Agricultural Fruit and Nut Crop Uses

Agricultural Vegetables and Field Crop Uses

Basic Copper Sulfate

Wettable Powder Agricultural Fungicide

Active Ingredient

Elemental Copper*

53%

Inert Ingredients:

47%

Total

100%

* From basic copper sulfate

EPA Reg. No. 8901-16-1812

EPA Est. No. 45450-AZ-1

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

CAPTEC 4L
 Captan Flowable Fungicide

- Formulated to provide maximum surface area coverage and enhanced biological activity
- For economic disease control on fruits, nuts, vegetables and field crops
- Convenient flowable formulation for easy measuring and mixing
- Weatherproofed to stick to the plant surface and resist wash off
- Pours clean out of the container--with no waste

CAPTEC 4L is a unique flowable fungicide containing 4 pounds of Captan per gallon. CAPTEC 4L is a highly effective fungicide which gives economic broad spectrum disease control on numerous crops. The CAPTEC 4L formulation combines the right particle size and shape with the right blend of surfactants and weather-proofing agents to provide increased surface area coverage and resistance to wash off for increased biological activity.

Agricultural Fruit and Nut Crop Uses
 Agricultural Vegetable and Field Crop Uses

Captan Flowable Fungicide
 Active Ingredient
 *Captan
 Inert Ingredients
 Total

By Wt.
 38%
 62%
 100%

* N-[(trichloromethyl)thio]-4-cyclohexene-1,2-dicarboximide

E.P.A. Reg. No. 1812-260
 E.P.A. Est. No. 1812-GA-3

112 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

DU-TER Flowable
Triphenyltin Hydroxide Flowable Fungicide

- Controls numerous fungal diseases of pecans, potatoes, sugarbeets and certain other crops.
- Convenient flowable formulation for easy measuring and mixing
- Pours clean out of the container--with no waste

DU-TER FLOWABLE is a unique fungicide containing 30 oz. of TPTH per gallon. DU-TER FLOWABLE is a highly effective contact fungicide which gives economic disease control on labeled crops. The DU-TER FLOWABLE formulation combines the right particle size and shape with the right blend of surfactants and weather-proofing agents to provide increased surface area coverage.

Agricultural Crop Uses

DU-TER Triphenyltin Hydroxide Fungicide

Active Ingredient:

Triphenyltin hydroxide	19.7%
Inert Ingredients	80.3%
Total:	100.0%

Contains 30 oz. triphenyltin hydroxide per gallon

EPA Reg. No. 1812-277
EPA Est. No. 1812-GA-3

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

K-COP
Liquid Agricultural Fungicide

Active Ingredient

*Copper as elemental	8%
Inert Ingredients	92%
	100%

*From Copper-Ammonium Complex
Contains 0.77 Lbs. Metallic Copper per Gal.

EPA Reg. No. 1812-298
EPA Est. No. 8901-TX-1

114 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

KOCIDE 20/20

Wettable Powder Agricultural Fungicide and Zinc Nutritional Seed Dressing

- Excellent fungicide and bactericide for use on wide range of crops
- Elemental copper and zinc in available form for nutritional use
- Excellent mixing, spraying, and compatibility characteristics

KOCIDE 20/20 brings together the broad fungicidal properties of copper hydroxide plus nutritional levels of zinc. KOCIDE 20/20 is uniquely formulated to allow application by aerial means as well as concentrate and dilute ground sprayer. The broad spectrum of fungus and bacterial diseases makes KOCIDE 20/20 ideal for use on fruit and nut crops.

Agricultural Crop Uses

KOCIDE 20/20

Wettable Powder Agricultural Fungicide and Zinc Nutritional Seed Dressing

Active Ingredient	30.7%
Copper Hydroxide (Metallic Copper Equivalent 20%)	
Inert Ingredients	69.3%
(Metallic Zinc Equivalent 20% Derived from Basic Zinc Salts)	
Total	100.0%

U.S. Patent No. 3,428,731

EPA Reg. No. 1812-305

EPA Est. No. 8901-TX-1

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

KOCIDE 101

Wettable Powder Agricultural Fungicide

- Controls many fungal and bacterial diseases on over 47 crops
- Excellent mixing, spraying and compatibility characteristics
- High suspensibility, high surface area, low bulk density, small particle
- Proven in more than fifteen years of research and grow use

KOCIDE 101 is a wettable powder formulation containing 77% cupric hydroxide uniquely prepared to assure compatability with other fungicides and insecticides. Ideal particle size and shape maximize fungicidal activity of KOCIDE 101 allowing application by ground concentrate and dilute sprayers as well as aircraft. KOCIDE 101 is packaged for easy handling over a broad range of use patterns and crops.

Agricultural Ornamental Crop Uses

Frost Protection

Citrus Canker

Agricultural Fruit and Nut Crop Uses

Agricultural Vegetable Crop Uses

Agricultural Field Crop Uses

KOCIDE 101

Wettable Powder Agricultural Fungicide

Active Ingredient

Cupric Hydroxide	77%
Inert Ingredients	23%
	100%
(Metallic Copper Equivalent	50%)

U.S. Patent No. 3,428,731

EPA Reg. No. 1812-288

EPA Est. No. 8901-TX-1

116 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

KOCIDE 404S

Flowable Agricultural Fungicide

- Convenient flowable formulation for easy measuring and mixing
- Contains 27% Cupric Hydroxide in the same form as KOCIDE 101
- Contains 15.5% Sulfur in same form as SUPER SIX to provide maximum surface area coverage and enhanced biological activity
- Weatherproofed to stick to the plant surface and resist wash-off

KOCIDE 404S is a unique flowable fungicide containing 3.2 lbs. of cupric hydroxide plus 15.5% sulfur. KOCIDE 404S is especially formulated to be used in combination with many insecticides and nutrients. The KOCIDE 404S formulation combines superior particle size and shape with a special blend of surfactants and weatherproofing agents to maximize fungicidal activity.

Agricultural Crop Uses

KOCIDE 404S

Flowable Agricultural Fungicide

Active Ingredients

Cupric Hydroxide	27.0%
Sulfur	15.5%
Inert Ingredients	57.5%
Total	100.0%

Contains 3.2 lbs cupric hydroxide per gal.

EPA Reg. No. 1812-295

EPA Est. No. 8901-TX-1

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

KOCIDE 606
Flowable Agricultural Fungicide

- Convenient flowable formulation for easy measuring and mixing
- Controls many fungal and bacterial diseases on more than 47 crops
- Pours clean out of the container
- Excellent mixing, spraying, and compatibility characteristics

KOCIDE 606 is a unique flowable formulation containing 77% cupric hydroxide uniquely prepared to assure compatibility with other fungicides and insecticides. Ideal particle size and shape maximize fungicidal activity of KOCIDE 606 allowing application by ground concentrate and dilute sprayers as well as aircraft. KOCIDE 606 is packaged for easy handling over a broad range of use patterns and crops.

Agricultural Ornamental Crop Uses
Agricultural Fruit and Nut Crop Uses
Agricultural Vegetable Crop Uses
Agricultural Field Crop Uses

KOCIDE 606
Flowable Agricultural Fungicide

Active Ingredient	
Cupric Hydroxide	37.5%
Inert Ingredients	62.5%
	100.0%

Contains 4.5 Lbs. Cupric Hydroxide per gal.

EPA Reg. No. 1812-303
EPA Est. No. 1812-GA-3

118 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides (Continued):

Product Name:

KOCIDE SD
Seed Dressing Agricultural Fungicide

- Specially formulated for use as a seed protectant
- Compatible with many fungicides and materials commonly used as seed disinfectants
- Excellent mixing, spraying, and compatibility characteristics

KOCIDE SD is specially formulated for uses as a seed protectant. KOCIDE SD contains 3.2 lbs. of cupric hydroxide per gallon specially formulated for use with many fungicides and other materials commonly used as seed disinfectants. KOCIDE SD is readily used in all seed treating machines.

Agricultural Crop Uses

KOCIDE SD
Seed Dressing Agricultural Fungicide

Active Ingredient	
Cupric Hydroxide	30%
Inert Ingredients	70%
Total	100%

Contains 3.2 Cupric Hydroxide per gal.

U.S. Patent No. 3,428,731

EPA Reg. No. 1812-301
EPA Est. No. 8901-TX-1

GRIFFIN CORP.:Fungicides(Continued):

Product Name:

MANEX

Maneb Flowable with Zinc Added

- Controls numerous fungal diseases on a broad range of crops
- Formulated to provide maximum surface area coverage and enhanced biological activity
- Convenient flowable formulation for easy measuring and mixing
- Weatherproofed to stick to plant surface and resist wash off
- Pours clean out of the container--with no waste

MANEX is a unique flowable fungicide containing 4 pounds of Maneb per gallon with zinc added. MANEX is a highly effective fungicide which gives economic broad spectrum disease control on numerous crops. The MANEX formulation combines the right particle size and shape with the right blend of surfactants and weather-proofing agents to provide increased surface area coverage and resistance to wash off for increased biological activity.

Agricultural Fruit and Nut Crop Uses
 Agricultural Vegetable Crop Uses
 Agricultural Field Crop Uses
 Agricultural Ornamental Crop Uses

MANEX

Maneb Flowable with Zinc Added

37% Maneb Dispersion 4 pounds of Maneb per gallon

Active Ingredient:

Maneb (Manganese Ethylenebisdithiocarbamate)	37%
(Total Manganese as metallic...7.6%)	
Inert Ingredients	63%
	100%

EPA Reg. No. 1812-251
 EPA Est. No. 1812-GA-3

120 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

PRO-TEX

Flowable Combination of Maneb and Triphenyltin Hydroxide
Fungicide

- Formulated to provide maximum surface area coverage and enhanced fungicidal activity.
- Superior control of early and late blight of potatoes and Cercospora leafspot of sugarbeets.
- Convenient flowable formulation for easy measuring and mixing.
- Eliminates waste from tank-mixing separate formulations.
- Pours clean out of the container--with no waste.
- Weatherproofing agent maintains residues on plant surface and resists wash-off.

PRO-TEX is a truly unique flowable fungicide combining the fungicidal activity of maneb and triphenyltin hydroxide. PRO-TEX is highly effective against fungi causing Early and Late Blights of potatoes and Cercospora leafspot of sugarbeets. PRO-TEX is formulated with the optimum fungicide particle size, and shape to provide the greatest biological activity. Weatherproofing agents further insure biological activity by remaining on the plant surface even during rain and irrigation.

Agricultural Crop Uses

PRO-TEX

Active Ingredients

Maneb (Manganese Ethylenebisdithiocarbamate)	32.63%
Triphenyltin hydroxide	4.72%

Inert Ingredients	62.65%
Total	100.00%

EPA Reg. No. 1812-269

EPA Est. No. 1812-GA-3

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

SUPER SIX
Liquid Sulfur

- Formulated to provide maximum surface area coverage and enhanced biological activity
- Convenient flowable formulation for easy measuring and mixing
- Premium formulation for fungicide, miticide, and nutritional use on numerous crops
- Weatherproofed to stick to the plant surface and resist wash off
- Pours clean out of the container--with no waste

SUPER SIX is a unique flowable fungicide/miticide containing 6 pounds of Elemental Sulfur per gallon. SUPER SIX is a highly effective fungicide/miticide which gives economic broad spectrum control on numerous crops. The SUPER SIX formulation combines the right particle size and shape with the right blend of surfactants and weather-proofing agents to provide increased surface area coverage and resistance to wash off for increased biological activity.

Agricultural Fruit and Nut Crop Uses
Agricultural Field and Vine Crop Uses

SUPER SIX Liquid Sulfur

Active Ingredient:

Sulfur as S		52.0%
Inert Ingredients		48.0%
	Total	100.0%

EPA Reg. No. 1812-196
EPA Est. No. 1812-GA-3

122 Fungicides, Biocides and Preservatives

GRIFFIN CORP.: Fungicides(Continued):

Product Name:

SUPER TIN 4L
Triphenyltin Hydroxide Flowable Fungicide

- Controls numerous fungal diseases of pecans, potatoes, sugarbeets and certain other crops
- Formulated to provide maximum surface area coverage and enhanced biological activity
- Convenient flowable formulation for easy measuring and mixing
- Weatherproofed to stick to the plant surface and resist wash off
- Pours clean out of the container--with no waste

SUPER-TIN 4L is a unique flowable fungicide containing 4 pounds of TPTH per gallon. SUPER-TIN 4L is a highly effective contact fungicide which gives economic disease control on labeled crops with no known resistance. The SUPER-TIN 4L formulation combines the right particle size and shape with the right blend of surfactants and weather-proofing agents to provide increased surface area coverage and resistance to wash off for increased biological activity. SUPER-TIN 4L is also pH balanced to provide minimum degradation of insecticides which may be used in the tank mix.

Agricultural Crop Uses

SUPER-TIN 4L
Triphenyltin Hydroxide Flowable Fungicide

Active Ingredient:	
Triphenyltin Hydroxide	40.0%
Inert Ingredients:	60.0%
Total:	100.0%

EPA Reg. No. 1812-244
EPA Est. No. 1812-GA-3

GUSTAFSON, INC.: Grain and Seed Treating Chemicals:

Product Name:

GUSTAFSON Apron-FL Seed Treatment Fungicide

A seed treatment chemical for control of seed rot and damping off diseases of certain crops.

For use only by commercial seed treaters.

Active Ingredient: Metalaxyl:N-(2,6-dimethylphenyl)-N-(methoxyacetyl)alanine methyl ester	28.35%
Inert Ingredients:	71.65%
Total	100.00%

Contains 2.65 Metalaxyl pounds per gallon.

APRON trademark of CIBA-GEIGY for Metalaxyl

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-42

GUSTAFSON Apron 25W

Fungicide

A seed treatment chemical for control of systemic downy mildew, seed rot and damping-off diseases of certain crops

For use only by commercial seed treaters

Active Ingredient: Metalaxyl: N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester	25.0%
Inert Ingredients:	75.0%
Total:	100.0%

EPA Reg. No. 100-639

Ciba-Geigy

124 *Fungicides, Biocides and Preservatives*

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON BOTRAN-30C

For use only in combination with GUSTAFSON 42-S Thiram (EPA Reg. No. 7501-14) and/or VITAVAX-30C** Concentrate (EPA Reg. No. 400-124)

Active Ingredients:

* (2,6-Dichloro-4-nitroaniline)	30%
Inert Ingredients:	70%
Total:	100%

U.S. Pat. 4,372,080

EPA Reg. No. 7501-28

EPA Est. No. 7501-ID-1

GUSTAFSON Captan-DCNA 60-20

Seed Protectant Fungicide

Active Ingredients:

	By Wt.
*Captan	56.72%
Related Derivatives	3.28%
**DCNA	20.00%
Inert Ingredients:	20.00%
Total:	100.00%

* [(Trichloromethyl) thio]-4-cyclohexene-1,2-dicarboximide

** 2,6-Dichloro-4-nitroaniline

EPA Est. No. 42056-IL-1

EPA Reg. No. 7501-62

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON Captan 400
Seed Protectant Agricultural Fungicide

Active Ingredients:

Captan(N-(trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide)	37.0%
Related Derivatives	2.1%
Inert Ingredients:	60.9%
Total	100.0%

Contains 4 lbs. Captan and related derivatives per U.S. gallon at 68F.

EPA Est. No. 7501-ID-1
EPA Reg. No. 7501-26

GUSTAFSON Captan 400-D
Seed Protectant Agricultural Fungicide
Dye Added

Active Ingredients:

Captan(N-(trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide)	37.0%
Related Derivatives	2.1%
Inert Ingredients:	60.9%
Total	100.0%

Contains 4 lbs. Captan and related derivatives per U.S. gallon at 68F.

EPA Est. No. 7501-ID-1
EPA Reg. No. 7501-27

GUSTAFSON Captan Methoxychlor 75-5
Seed Protectant
Agricultural Fungicide-Insecticide
Contains Methoxychlor

Active Ingredients:

	By Wt.
*Captan	70.90%
Related Derivatives	4.10%
**Methoxychlor, Technical	5.00%
Inert Ingredients	20.00%
*N-[(trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide.	
**Equivalent to 4.4% 2,2-bis(p-methoxyphenyl)-1,1,1-trichloroethane and 0.6% of other isomers and related compounds.	

EPA Est. No. 42056-IL-1
EPA Reg. No. 7501-93

126 Fungicides, Biocides and Preservatives

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON Captan 75%
Seed Protectant Agricultural Fungicide

Active Ingredients:	By. Wt.
*Captan	70.90%
Related Derivatives	4.10%
Inert Ingredients:	25.00%
*N-[(trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide]	

EPA Est. No. 42056-IL-1

EPA Reg. No. 7501-92

GUSTAFSON Captan 300
Seed Protectant Agricultural Fungicide

Active Ingredients:	
Captan(N-(trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide)	28.4%
Related Derivatives	1.6%
Inert Ingredients:	70.0%
Total	100.0%

Contains 3 lbs. Captan and related derivatives per U.S. gallon at 68F.

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-8-AA

GUSTAFSON Captan 30-DD
Seed Protectant Agricultural Fungicide

Active Ingredients:	
Captan(N-trichloromethyl)thio-4-cyclohexene-1,2-dicarboximide)	28.4%
Related Derivatives	1.6%
Inert Ingredients:	70.0%
Total	100.0%

Contains 3 lbs. Captan and related derivatives per U.S. gallon at 68F.

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-9-AA

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

KE Chloroneb 65W Fungicide

Active Ingredient:	
Chloroneb(1,4-dichloro-2,5-dimethoxybenzene)	65%
Inert Ingredients:	35%

U.S. Patent 3,265,564
 EPA Reg. No. 41014-4
 EPA Est. No. 42761-MS-1

GUSTAFSON Evershield C
 Captan Seed Protectant

Active Ingredients:	
*Captan	28.37%
Related derivatives	1.63%
Inert Ingredients:	70.00%
*N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide	

EPA Reg. No. 7501-77
 EPA Est. No. 46832-AR-1

GUSTAFSON EVERSCHILD II
 Seed Protectant with Captan and Malathion

Active Ingredient:	
Captan*	27.62%
Related derivatives	1.59%
Malathion	.34%
O,O-dimethyl dithlophosphate of diethyl mercaptosuccinate	
Inert Ingredients:	70.45%
*N-trichloromethylthio-4-cyclohexene-1,2-dicarboximide	

Active Ingredients per Gallon:	
Captan	2.89 lbs./gal.
Malathion	0.03 lbs./gal.

U.S. Patent No. 3,113,399
 EPA Reg. No. 7501-63
 EPA Est. No. 46832-AR-1

128 Fungicides, Biocides and Preservatives

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON FLO-PRO D Seed Protectant

Active Ingredient:

Chloroneb(1,4-dichloro-2,5-dimethoxybenzene) 35.5%

Inert Ingredients: 64.5%

Chloroneb (DEMOSAN) 3.3 lbs./gal.

U.S. Patent No. 3,113,399

EPA Reg. No. 7501-68

EPA Est. No. 46832-AR-01

GUSTAFSON FLO-PRO-IMZ

Systemic Fungicide

Active Ingredient:

Imazilil: (1-(2-(2,4-dichlorophenyl)-2-(2-propenyloxy)
ethyl)-1H imidazole) 10%

Inert Ingredients: 90%

Contains 0.86 lbs. of Imazilil* per gallon

* Active ingredient is manufactured by Janssen Pharmaceutica
n.v., Beerse, Belgium

EPA Reg. No. 43813-3-7501

EPA Est. No. 7501-ID-1

U.S. Patent No. 3,658,813

GUSTAFSON 4-Way

For Seed Disease Control

Seed Protectant Fungicide

Active Ingredients:

Captan* 17.81%

Related Derivatives 0.94%

Maneb** 18.75%

Pentachloronitrobenzene 10.00%

5-Ethoxy-3-trichloromethyl-1,2,4-thiazole 2.50%

Inert Ingredients 50.00%

* N-[(trichloromethyl)thio]-4-cyclohexene-1,2-dicarboximide.

** Manganese ethylenebisdithiocarbamate

EPA Reg. No. 7501-111

EPA Est. 42056-IL-1

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON Flowable Lindane 40%

Active Ingredients:
Lindane (Gamma isomer of benzene hexachloride) 40%
Inert Ingredients: 60%

EPA Est. No. 7501-ID-1
EPA Reg. No. 7501-16

GUSTAFSON Lindane 30C Flowable

Active Ingredient:
Lindane (Gamma isomer of benzene hexachloride) 30%
Inert Ingredients 70%

EPA Est. No. 7501-ID-1
EPA Reg. No. 7501-34

GUSTAFSON LORSBAN 30 Flowable

Active Ingredient:
Chlorpyrifos (O,O-diethyl O-(3,5,6-trichloro-2-pyridyl)
phosphorothioate) 30.0%

Inert Ingredients:
Xylene range aromatic solvent 15.8%
Other Inerts 54.2%
Total 100.0%

EPA Est. No. 7501-ID-1
EPA Reg. No. 7501-31

Flowable (Water Dispersible Suspension) MERTECT LSP Fungicide
Wheat Seed Treatment
To Control Seed- and Soil-Borne Common Bunt (Stinking Smut) and
Dwarf Bunt of Wheat

Active Ingredient
2-(4-thiazolyl) benzimidazole 30%
Inert Ingredients 70%

EPA Est. 07501-ID-1
EPA Reg. No. 618-84-AA
U.S. Pats. 3,370,957

MSDAGVET
Division of Merck & Co., Inc.

130 Fungicides, Biocides and Preservatives

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON Methoxychlor 300

Active Ingredients:

Methoxychlor Technical*	30%
Inert Ingredients:	70%
	100%

*2,2-bis (p-methoxyphenyl)-1,1,1-trichloroethane	26.4%
Related compounds	3.6%

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-15

GUSTAFSON PRO-GRO

Dust Seed Protectant Fungicide

Active Ingredient:

Carboxin(5,6-Dihydro-2-methyl-N-phenyl-1,4-oxathin-3-carboxamide)	30%
Thiram (Tetramethylthiuram disulfide)	50%
Inert Ingredients:	20%

EPA SLN No. CA-850026

EPA SLN No. WA-840070

EPA Est. 30856-CN-1

CA Reg. No. 7501-50026-AA

GUSTAFSON RTU-PCNB

Seed Protectant

Active Ingredient:

Pentachloronitrobenzene	24.0%
Inert Ingredients:	76.0%
Total	100.0%

Contains 2.23 lbs. of Pentachloronitrobenzene per U.S. Gallon

EPA Reg. No. 7501-70

EPA Est. No. 46832-AR-01

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:GUSTAFSON RTU-PCNB/LINDANE
Seed Protectant

Active Ingredients:

Pentachloronitrobenzene	17.68%
Lindane(gamma isomer of benzenehexachloride)	10.53%

Inert Ingredients:	71.79%
Total	100.00%

This product contains 1.68 lbs. of PCNB per gallon

This product contains 1.00 lbs. of Lindane per gallon

EPA Reg. No. 7501-78

EPA Est. No. 46832-AR-01

GUSTAFSON TERRA-COAT L-21N

Seed Treatment Fungicide with Dye

Active Ingredients:

Pentachloronitrobenzene	22.6%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadazole*	11.3%

Inert Ingredients:	66.1%
Total:	100.0%

* U.S. Patents 3,260,588, 3,260,725 and others

Contains 2 lbs. of Pentachloronitrobenzene and 1 lb. of 5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadazole per U.S. gallon at 68F(20C)

EPA Reg. No. 7501-56

EPA Est. No. 39578-TX-1

GUSTAFSON TERRA-COAT L-205N

Seed Treatment Fungicide with Dye

Active Ingredients:

Pentachloronitrobenzene	23.1%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole*	5.8%

Inert Ingredients:	71.1%
Total	100.0%

*U.S. Patents 3,260,588, 3,260,725 and others.

Contains 2 lbs. of Pentachloronitrobenzene and 0.5 lb. of 5-Ethoxy-3-(trichloro-methyl)-1,2,4-thiadiazole per U.S. gallon at 68F(20C).

EPA Reg. No. 7501-57

EPA Est. 39578-TX-1

132 *Fungicides, Biocides and Preservatives*

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON TERRA-COAT LT-2N
Seed Treatment Fungicide with Dye

Active Ingredients:

Pentachloronitrobenzene 23.7%

Inert Ingredients: 76.3%

Total: 100.0%

Contains 2 lbs. of Pentachloronitrobenzene per U.S. Gallon at
68F(20C)

EPA Reg. No. 7501-55

EPA Est. No. 39578-TX-1

GUSTAFSON TERRACLOR SUPER-X 20-5 Dust with Graphite

Active Ingredients:

Pentachloronitrobenzene 20.0%

5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole 5.0%

Inert Ingredients: 75.0%

Total 100.0%

EPA Est. No. 42056-IL-1

EPA Reg. No. 7501-54

GUSTAFSON TERRACLOR SUPER-X with MOLY

Seed Treatment Fungicide for Soybeans
Non-Oil Lubricant Added

Active Ingredients:

Pentachloronitrobenzene 10.0%

5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole 2.5%

Inert Ingredients: 87.5%

Total: 100.0%

Sodium Molybdate 6.0%

EPA Est. No. 42056-IL-1

EPA Reg. No. 7501-47

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON Thiram-30 FUNGICIDE

Active Ingredient:	
Thiram (Tetramethylthiuram disulfide)	30%
Inert Ingredients	70%
Total	100%

EPA Est. No. 07501-ID-01

EPA Reg. No. 7501-17-AA

GUSTAFSON Thiram 50WP DYED

Active Ingredient:	By.Wt.
Thiram (Tetramethylthiuram disulfide)	50.0%
Inert Ingredients	50.0%
	100.0%

EPA Est. 42056-IL-1

EPA Reg. No. 7501-105

GUSTAFSON 42-S

Thiram Fungicide and Repellent Original Formulation

Active Ingredient:	
Thiram (Tetramethylthiuram disulfide)	42%
Inert Ingredients:	58%
Contains 4 pounds thiram per gallon.	

U.S. Pat. 4,372,080

EPA Est. No. 07501-ID-01

EPA Reg. No. 7501-14AA

GUSTAFSON TOPS-2.5D

Potato Seed-Piece Treatment Fungicide Dust

Active Ingredient:	
Thiophanate-methyl (dimethyl[(1,2-phenylene) bis(iminocarb- onothioyl)]bis[carbamate])*	2.5%
Inert Ingredients:	97.5%
Total	100.0%

* Also known as dimethyl 4,4'-O-phenylenebis[thioallophanate].

EPA Reg. No. 7501-32

EPA Est. No. 38091-ID-1

134 Fungicides, Biocides and Preservatives

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

VITAVAX Fungicide
Not for Reformulation

Composition

Active Ingredients (% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxan-
ilide)* 75.0%

Inert Ingredients 25.0%

Total: 100.0%

U.S. Patents 3,249,499 - 3,393,202 - 3,454,391

Uniroyal Chemical Company, Inc.

EPA Reg. No. 400-80-AA

EPA Est. No.

GUSTAFSON VITAVAX CAPTAN 20-20 Seed Protectant

Active Ingredients

By.Wt.

*Captan 19%

Related Derivatives 15%

**Carboxin 20%

Inert Ingredients: 60%

*N-[(trichloromethyl)thio]-4-cyclohexene-1,2-dicarboximide)

**5,6-Dihydro-2-methyl-1,4 oxathiin-3-carboxanilide

* U.S. Patents 3,454,391

EPA Est. No.

EPA Reg. No. 7501-36

GUSTAFSON VITAVAX-HB POUR-ON Flowable Fungicide

Active Ingredients: (% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carbox-
anilide)* 5.7%

Thiram (tetramethylthiuram disulfide) 5.7%

Inert Ingredients: 88.6%

Total: 100.0%

* U.S. Patent 3,454,391

EPA Reg. No. 400-156-7501

EPA Est. No. 7501-ID-01

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

GUSTAFSON VITAVAX-Maneb-Lindane
Flowable Fungicide
Seed Protectant

Active Ingredients: (% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide)*	14%
Maneb (Manganese ethylenebisdithiocarbamate) (Manganese equivalent as metallic 3.51%)	12%
Lindane (Gamma isomer of benzene hexachloride)	8%
Inert Ingredients:	66%
Total:	100%

* U.S. Patents 3,454,391

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-40

GUSTAFSON VITAVAX-PCNB
Flowable Fungicide

Active Ingredients:

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide)*	17%
Pentachloronitrobenzene	17%
Inert Ingredients:	66%
	100%

U.S. Patent No. 3,454,391

Contains 1.68 lbs. carboxin and 1.68 lbs. PCNB per U.S. gallon.

EPA Est. No. 7501-ID-1

EPA Reg. No. 7501-87

GUSTAFSON VITAVAX--34
Seed Treatment

Composition

Active Ingredient: (% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide)*	34.0%**
Inert Ingredients	66.0%
Total	100.0%

* U.S. Patents--3,454,391

** Contains 3.34 pounds of active Carboxin per gallon.

EPA Reg. No. 400-107-7501

EPA Est. No. 7501-ID-01

136 *Fungicides, Biocides and Preservatives*

GUSTAFSON, INC.: Grain and Seed Treating Chemicals(Continued):

Product Name:

VITAVAX-30C Concentrate

Composition

Active Ingredients:(% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxan-
ilide)* 29.52%**

Inert Ingredients: 70.48%

Total: 100.00%

*U.S. Patents 3,454,391

**Contains 2.9 pounds of active Carboxin per gallon.

Mfg. by Uniroyal Chemical--Division of Uniroyal, Inc.

EPA Reg. No. 400-124-AA

EPA Est. No. 7501-1D-1

VITAVAX-200

Flowable Fungicide (VITAVAX with Thiram)

Composition

Active Ingredients: (% by weight)

Carboxin (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxan-
ilide)* 17.0%

Thiram (tetramethylthiuram disulfide) 17.0%

Inert Ingredients 66.0%

Total: 100.0%

*U.S. Patents 3,454,391

Uniroyal Chemical Company, Inc.

EPA Reg. No. 400-112

EPA Est. No. 7501-1A-1

HOPKINS AGRICULTURAL CHEMICAL CO.: DICHLONE Wettable Powder
Fungicide:

DICHLONE 50W is an agricultural fungicide for use on fruit and vegetables as well as various ornamentals. DICHLONE 50W effectively controls brown rot blossom blight of stone fruits and scab on apples as well as blights on various vegetables.

Features and benefits.

- Multisite enzyme action.
Prevents development of disease resistance.
- Scab protectant and eradicator.
Spray only as needed; therefore, potentially fewer applications.

Advantages:

- Good efficacy of brown rot of pome fruits.
- Eradicator properties on scab in apples and pome fruits.
- Good efficacy on late blight of tomatoes when mixed with Dithane or Maneb.
- Multisite enzyme action prevents development of pathogen resistance.

Active Ingredient:

Dichlone (2,3-Dichloro-1,4-naphthoquinone) 50%

Inert Ingredients:

Total

50%
50%
100%

EPA Reg. No. 2393-290

EPA SLN No. VT-780005

EPA SLN No. ME-780005

EPA SLN No. NY-780019

138 Fungicides, Biocides and Preservatives

KINCAID ENTERPRISES, INC.: CHLORONEB FUNGICIDE:

CHLORONEB Fungicide makes the difference.

Now you can get a healthy stand the first time with CHLORONEB

- Controls seedling diseases due to Rhizoctonia and Pythium
- Systemic in action
- Improves stands and plant vigor
- Recommended as a seed treatment to be used in conjunction with standard seed protectant

Available as 65% wettable powder and 3 lb. flowable formulation.

- Controls pre and post-emergence seedling diseases.
- Gives extended disease protection--has systemic action.
- Reduces costly replantings in Cotton, Edible Beans and Soybeans.
- Can be applied as Hopperbox treatment as an overcoat.
- Wide margin of safety to seed and plants. Low in toxicity.

Active Ingredient:

(Chloroneb) (1,4-dichloro-2,5-dimethoxybenzene)

30.0%

Inert Ingredients

70.0%

U.S. Pat. 3,265,564

EPA Reg. No. 41014-7

EPA Est. 41014-WV-01

KINCAID ENTERPRISES, INC.: FUNGICIDES:

Product Name:

TERRANEB SP Turf Fungicide:

Snow Mold
Pythium

Active Ingredient: CHLORONEB (1,4-dichloro-2,5-dimethoxybenzene) 65%
Inert Ingredients 35%

U.S. Pats. 3,265,564

EPA Reg. No. 41014-6

General Information: Terraneb SP Turf Fungicide is recommended for the treatment of turfgrasses for the control of snow mold (Typhula) and Pythium blight.

CHLORONEB 65W Fungicide

Active Ingredient: CHLORONEB (1,4-dichloro-2,5-dimethoxybenzene) 65%
Inert Ingredients 35%

U.S. Pat. 3,265,564

EPA Reg. No. 41014-4
EPA Est. No. 42761-MS-1

General Information: K.E. CHLORONEB 65W Fungicide is recommended for use as a supplemental seed treatment, for the control of seedling diseases of cotton, beans and soybeans; and as a supplemental seed treatment for sugar beets. It is to be used in conjunction with a standard fungicide seed treatment. When used as directed, CHLORONEB 65W can be expected to improve stands and plant vigor through the suppression of seedling blights, soreshin, and pre- and post-emergence damp-off caused by such organisms as Rhizoctonia and Pythium species and Sclerotium rolfsii. It is highly effective in preventing post-emergence damp-off, especially when used as a supplemental seed coating.

140 *Fungicides, Biocides and Preservatives*

KOPPERS CO., INC.: COPPER TREAT 110 Ready-to-Use Wood Preservative:

General:

COPPER TREAT 110 water repellent wood preservative is effective against wood destroying fungi and termites. It can also be used as a fungicide on other cellulosic materials such as canvas and rope.

Product Characteristics:

Description: A clear green petroleum based liquid having a mild petroleum-like odor.

Use: Apply by dipping or coating to lumber, timbers, fence posts, poles and other wood members for protection against termites and decay causing fungi.

COPPER TREAT 110 preservative may also be applied to burlap, canvas, rope, nets, textiles and other similar cellulosic materials as a mildewcide. DO NOT USE INDOORS.

Acceptance: Conforms to Federal Specification TTW W-572b, Composition B

EPA Reg. No. 453-283

EPA Est. 453-MO-1

AWPA Standard P-8

Technical Data:

Ingredients

Active: Copper naphthenate 11.2%

Inert: Petroleum solvent 88.8%

Physical Properties:

Boiling Range - 313 - 384F

% Volatile by volume - 89.1%

KOPPERS CO., INC.: COPPER TREAT 120 Ready-to-Use Wood Preservative:

General:

COPPER TREAT 120 water repellent wood preservative is effective against wood destroying fungi and termites in ground contact exposure. It also can be used as a fungicide on other cellulosic materials such as canvas and rope.

Product Characteristics

Description: A clear green petroleum based liquid having a mild petroleum odor.

Use: Apply by dipping or coating lumber, timbers, fence posts, poles and other wood members for protection against termites and decay causing fungi.

This product is useful to provide a protective barrier to the cut ends of previously pressure treated wood. It conforms to AWPA Standard M-4.

COPPER TREAT 120 preservative may also be applied to burlap, canvas, rope, nets, textiles and other similar cellulosic materials as a mildewcide. DO NOT USE INDOORS.

Acceptance: Conforms to Federal Specification TTW W-572b,
Composition C
EPA Reg. No. 453-282
EPA Est. 453-MO-1
AWPA Standard P-8

Ingredients

Active: Copper naphthenate 21.6%
Inert: Petroleum solvent 78.4%

Physical Properties:

Boiling Range - 313-384F
% Volatile by volume - 81.4%

142 Fungicides, Biocides and Preservatives

KOPPERS CO., INC.: Sapstein Control Chemical NP-1:

For Industrial Use Only

General:

Sapstein Control Chemical NP-1 is a chemical concentrate, containing a combination of highly effective fungicides for aiding in the control decay, of sapstein and mold-producing fungi and bacteria that attack, discolor and degrade freshly-sawn lumber.

Product Characteristics:

Description: Clear, heavy, amber, freely pourable solution.

Use: For lumber 2" or less in thickness use one (1) gallon of NP-1 for every 200 gallons of water used in making up the solution. For thicker stock, or under severe sap-stain seasoning conditions use double strength solutions.

Acceptance:

EPA Reg. No. 453-297

EPA Est. No. 453-MO-1

Active Ingredients:

Didecyl dimethyl Ammonium Chloride	64.80%
------------------------------------	--------

3-Iodo-2-Propynyl Butyl Carbamate	7.60%
-----------------------------------	-------

Inert Ingredients:	27.60%
--------------------	--------

Total	100.00%
-------	---------

Physical Properties

Boiling Range	Not Applicable
---------------	----------------

% Volatile by Volume	25%
----------------------	-----

KOPPERS CO., INC.: TIMBERTREAT 625 Insecticide:

For Industrial Use Only

General:

TIMBERTREAT 625 is recognized as providing control of and protection against ambrosia beetles and wood borers in freshly felled logs and green lumber. Properly applied it also provides protection to "decked" logs against bark beetles. TIMBERTREAT 625 can also be combined with anti-stain chemicals to provide dual protection for lumber against ambrosia beetles and stain causing fungi.

Product Characteristics:

Description: Dark amber; petroleum odor

Use: Application to green lumber and freshly felled logs or log decks for control of ambrosia and bark beetles during storage and prior to drying or cutting.

EPA Est. 453-MO-1

EPA Reg. No. 453-115

Active Ingredients:

Lindane	11.34%
Petroleum Solvents	75.66%
Inert Ingredients:	13.00%
Total	100.00%

Physical Properties

Boiling Range	311-620F
% Volatile	8.9%

144 Fungicides, Biocides and Preservatives

KOPPERS CO., INC.: TRIBUCIDE P-75 Concentrate Water Repellent
Wood Preservative:

For Industrial Use Only

General:

TRIBUCIDE P-75 Concentrate is a water repellent wood preservative. This solution has been specially formulated for dilution and subsequent treatment of millwork prior to factory or field priming.

Product Characteristics:

Description: Clear liquid with mild petroleum solvent odor.

Use: TRIBUCIDE is used for the treatment of sash and other mill-work to meet the Seal of Approval program of the NWMA for a preservative water repellent (IS-4). It is also useful for the treatment of other wood products where the benefits of a preservative solution are desired that will help control fungus growths which cause rot and stain. It contains water repellents to aid in the the control of shrinking, swelling, end checking, grain raising and warping.

TRIBUCIDE P-75 Concentrate

EPA Reg. No. 453-288

EPA Est. 453-MO-1

Active Ingredients:

Bis(Tri-n-Butyltin) Oxide....3.75%

Inert Ingredients:.....96.75%

Total.....100.00%

Physical Properties

Boiling Range 313-354F

% Volatile by Volume 94.7%

KOPPERS CO., INC: TRIBUCIDE P-75 Ready to Use Water Repellent
Wood Preservative:

For Industrial Use Only

General:

TRIBUCIDE P-75 is a liquid ready-to-use water repellent wood preservative. This solution has been specially formulated for treatment of mill-work prior to factory or field priming.

Product Characteristics:

Description: Clear, light amber liquid with mild petroleum solvent odor.

Use: Tribucide is used for the treatment of sash and other mill-work to meet the Seal of Approval program of the NWWDA for a preservative water repellent (IS-4). It is also useful for the treatment of other wood products where the benefits of a preservative solution are desired that will help control fungus growths which cause rot and stain. It contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping. TRIBUCIDE may be applied by the vacuum, immersion, brush or flooding methods.

TRIBUCIDE P-75

EPA Reg. No. 453-273

EPA Est. 453-MO-1

Active Ingredients:

Bis(Tri-n-butyltin)...4.47%

Oxide.....0.75%

Inert Ingredients:.....99.25%

Total....100.00%

Physical Properties

Boiling Range 300-400F

% Volatile by Volume 98%

146 *Fungicides, Biocides and Preservatives*

KOPPERS CO., INC.: WOLMAN Treat OO Ready-to-Use Wood Preservative for Field Treatment:

General:

WOLMAN Treat OO wood preservative shall be used only for field treatment of previously WOLMANIZED pressure treated lumber, piling or plywood to help protect against decay causing fungi and termite attack. It conforms to AWPA Standard M-4.

Product Characteristics:

Description: A clear green mineral spirits based liquid with a mild petroleum-like odor.

Application: Exposed cut ends of WOLMANIZED pressure treated wood members may be treated by liberally brushing on two coats to insure total surface coverage. Do not use on non WOLMANIZED pressure treated wood. All cutting, framing and boring on lumber or timber be should completed prior to brush treatment.

Acceptance: Conforms to MIL-W-18124B Type A.

Conforms to AWPA Standards P8 and M-4.

EPA Reg. No. 61-172.

EPA Est. 453-MO-1.

Ingredients:

Active: Copper Naphthenate 21.6%

Inert: Petroleum solvent 78.4%

Physical Properties:

Boiling Range: 300 to 400F

% Volatile by volume: 81% to 85%

KOPPERS CO., INC.: WOODTREAT C81 Ready to Use Water Repellent Fungicide:

For Industrial Use Only

General:

The fungicide is recognized as effective for above ground use only and not recommended for ground contact. It has been developed for the protection of wood against fungi which cause mold, mildew, decay and stain. It also contains water repellents that aid in the control of shrinking, swelling, end checking, grain raising and warping.

Product Characteristics:

Description: A clear green liquid having a mild petroleum odor.

Use: Apply to the individual components for the manufacture of log homes, pallets, military walk-in refrigerators, wooden extension ladders, or other wood items for protection against fungal growths. WOODTREAT C81 meets the requirements of MIL-R-10932J which specifies a wood preservative formulation for military walk-in refrigerators, prefabricated panel type. This type formulation is also recognized and accepted by the U.S. Department of Agriculture for wood preservation in meat and poultry processing establishments. Water repellents are also contained in this solution for the control of dimensional stability for maximum protection.

Acceptance:

Meets Federal Specification TTW-572b Composition D

EPA Reg. No. 453-285

EPA Est. 453-MO-1

MIL-R-10932J (refrigerator, prefab, van type)

MIL-STD-1223J (refrigerator van bodies)

AWPA Standard P-8

CFR Title 21, Section 178.3800(may be safely used on wooden articles that are used in packaging, transporting or holding raw agricultural products).

Ingredients:

Active: Copper-8-quinolinolate-1%

Inert: Mineral spirit solvents and water repellents-99%

Physical Properties:

Boiling Range 300 to 400F

% volatile by volume 95%

148 Fungicides, Biocides and Preservatives

KOPPERS CO., INC.: WOODTREAT MB Ready-to-Use Water Repellent
Wood Preservative:

For Industrial Use Only

General:

WOOD TREAT MB RTU is a water repellent wood preservative.

This solution has been specially formulated for the treatment of millwork prior to factory or field priming. It is also effective on particleboard, plywood, and other dry wood products requiring protection.

Product Characteristics:

Description: Clear liquid with mild petroleum solvent odor.

Use: WOODTREAT MB is used for the treatment of sash and other millwork to meet the Seal of Approval program of the NWWDA for a preservative water repellent (IS-4). It is also useful for the treatment of other dry wood products where the benefits of a preservative solution are desired that will help control fungus growths which cause rot, mold and stain. It contains water repellents to aid in the control of shrinking, swelling, end checking, grain raising and warping. WOODTREAT MB may be applied by the vacuum, immersion, brush or flooding methods.

Woodtreat MB Ready-to-use

EPA Reg. No. 453-298

EPA Est No. 435-MO-1

Active Ingredients:

3-iodo-2-propynyl butyl carbamate	0.50%
Inert Ingredients	99.50%
Total	100.00%

Physical Properties:

Boiling Range	313-354F
% Volatile by Volume	99.0%

KOPPERS CO., INC.: WOODTREAT WB Concentrate Water Repellent
Wood Preservative:

For Industrial Use Only

General:

WOODTREAT WB Concentrate wood preservative is dilutable with water to provide a ready-to-use water repellent wood preservative which can be applied to wood by dip, soak, brush application method. The preservative helps control wood destroying fungi, staining and mold organisms. It also provides water repellency which helps control weathering, shrinking and swelling of wood. This preservative helps control wood destroying fungi, staining and mold organisms. It also provides water repellency which helps control weathering, shrinking and swelling of wood. This preservative is recommended for above ground use only.

Product Characteristics:

Description: WOODTREAT WB Concentrate is a clear amber solution with a mild petroleum odor. When diluted with water, it forms a white emulsion.

Directions for Use:

Exterior Millwork: Apply by dipping, flooding or brushing to exterior millwork and other wood products for protection against wood decay, mold and stain causing fungi.

Paintability: When used according to recommended methods of treatment, tests have shown that WOODTREAT WB produces an excellent paintable surface with no drying problems, paint discoloration and incompatibility.

Acceptance: EPA Reg. 453-284

Ingredients:

Active:

3-Iodo-2-propynyl butyl carbamate 5.97%

Inerts: 94.03%

150 *Fungicides, Biocides and Preservatives*

LEFFINGWELL: NUTRA-SPRAY COPPER FUNGICIDES:

Product Name:

NUTRA-SPRAY COPPER BORDEAUX 22:

Active Ingredient:

Copper (expressed as elemental) 22.0%

Inert Ingredients: 78.0%

Copper derived from Hydrated Basic Copper Sulfate.

NUTRA-SPRAY Copper Bordeaux 22 is a chemically reacted, spray dried product for general use as a copper fungicide.

E.P.A. Est. 7874-CA-1

EPA Reg. No. 400-381

NUTRA-SPRAY BASIC COPPER CARBONATE:

Active Ingredient:

Copper (expressed as metallic) 51.0%

Inert Ingredients: 49.0%

Copper derived from Basic Copper Carbonate.

A Copper Fungicide for General Use - A Spray Dried Product

E.P.A. Est. 7874-CA-1

EPA Reg. No. 400-382

M&T CHEMICALS, INC.: BIOMET TBTF (Tributyltin Fluoride) Anti-Foulant for Marine Paints:

BIOMET TBTF is an organotin compound for use in shipbottom paints to control the attachment of marine fouling organisms. BIOMET TBTF has been used successfully in a variety of coating formulations and in combinations with other additives to provide broad spectrum control of marine fouling organisms, thereby contributing to speed and operating economy of both commercial ships and pleasure craft.

The Advantages of BIOMET TBTF are:

- Chemical compatibility (non reactive) with coating ingredients
- Allows development of formulations with a full range of colors
- Noncorrosive to aluminum and steel
- Low water solubility
- Broad spectrum control of marine life including Barnacles-Algae-Tube Worms-Hydroids

Typical Properties

Physical form	White powder
Active Ingredient**	95% min.
Tin Content	38.0%
Specific Gravity	1.27
Solubility	Relatively insoluble in water and organic solvents

**Tin basis

EPA Labeling

BIOMET TBTF brand of tri-butyltin fluoride has been registered as an economic poison with the EPA by M&T--Registration No. 5204-19. Paint formulations have also been registered with EPA by M&T Chemicals, Inc.

It should be noted that each manufacturer must register his own formulation.

152 Fungicides, Biocides and Preservatives

M&T CHEMICALS, INC.: BIOMET TBTO Antifoulant Bis (tributyltin) Oxide for Shipbottom Paints:

BIOMET TBTO Antifoulant is an organotin compound, which will provide antifouling properties in marine paint formulations. Originally used solely in pleasure craft systems, BIOMET TBTO is now receiving wide acceptance in heavy marine systems as an adjunct to other antifouling ingredients.

The advantages of BIOMET TBTO Antifoulant are:

- Miscible in a wide range of resin and solvent systems.
- Compatibility with coating ingredients.
- Formulations with full range of colors.
- Non-corrosive to aluminum and steel.
- Low water solubility.
- Broad spectrum control of marine life including barnacles, algae, tubeworms, and hydroids.

Typical Properties of BIOMET TBTO

Physical form:	clear, straw colored liquid
Molecular weight:	596.0
% Assay as bis(tri-n-butyltin oxide):	96
% Tin content:	38.8
Specific gravity (25C/25C):	1.17
Lbs/Gal. (25C):	9.76

EPA Labeling

BIOMET TBTO brand of bis (tributyltin) oxide has been registered as an economic poison with the EPA by M&T--Registration No. 5204-1. Paint formulations have also been registered with the EPA by M&T Chemicals, Inc.

It should be noted that each manufacturer must register his own formulation.

M&T CHEMICALS, INC.: BIOMET 14 Antimicrobial Compound for
Protection of PVC Systems:

General Information

BIOMET 14 Antimicrobial Compound is a new odorless preservative which provides effective control of gram negative microorganisms when used as an additive to flexible polyvinyl chloride systems. In addition, BIOMET 14 Antimicrobial Compound provides outstanding protection for PVC against mildew and from discoloration due to microbial action even under the most severe conditions of soil burial. The broad spectrum antimicrobial properties provided by the addition of BIOMET 14 Antimicrobial Compound to vinyl film has received approval for effectiveness and safety from the Environmental Protection Agency.

Physical and Chemical Properties (Typical)

Composition	10% solution of diphenyl-stibine 2-ethyl hexoate in dioctylphthalate
Appearance	Clear, pale yellow liquid
Corrosiveness	Noncorrosive to metal or glass
Density (calculated)	
at 25C	1.0346
Lb/gal.	8.634

BIOMET 14 Antimicrobial Compound is registered with the Environmental Protection Agency, registration number 5204-42.

M&T CHEMICALS, INC.: BIOMET 430/45 Antifoulant for Marine Paints:

General Description

BIOMET 430/45* is a stable dispersion of tri-n-butyltin fluoride in organic solvent which offers greater process flexibility and shorter milling times in paint manufacture than solid TBTF. This translates into lower manufacturing costs.

Equivalent to BIOMET TBTF in activity spectrum, the dispersion can be used successfully in a variety of coating formulations to achieve broad spectrum control of marine fouling thereby contributing to speed maintenance and operating economy.

The Advantages of BIOMET 430/45 Are:

1. Easily dispersible with Cowles or other high-speed mixers.
2. Gives uniform fine paint grind.
3. Non-dusting, easy to handle.
4. Compatible in conventional and organotin polymer based paint systems.

Composition

Active Ingredient:	Tributyltin Fluoride	45% by Wt.
Inert Ingredients:		55% by Wt.

* U.S. Patents 4,153,574; 4,191,580

Seller makes no warranty, express or implied, concerning this product or its use other than the conditions of use indicated on its label bearing EPA registration 5204-61 and, subject thereto.

MAAG AGROCHEMICALS, INC.: NYTEK 10:

An Industrial Fungicide to Control Mold and Mildew

Active Ingredient:

Copper-8-Quinolinolate 10%

Inert Ingredients: 90%

EPA Reg. No. 35977-19

EPA Est. No. 33766-IN-01

A Fungicide to Control Wood Decay

Description: NYTEK 10 is a formulation of copper-8-quinolinolate designed for the treatment of lumber used above ground by dip or pressure process to control wood decay.

Mold and Mildew Inhibitor for Paints and Adhesives

A Fungicide for Industrial Cotton Fabrics to Prevent Mold and Mildew

Description: For treating cotton duck, cotton webbing, rope and similar items which require copper-8-quinolinolate as the fungicide. Following is a partial list of Federal Specifications calling for the use of copper-8-quinolinolate as the mildew inhibitor.

MIL-D-504-C, Class B	Dyeing and after treatment processes for cotton duck and twill.
MIL-R-1670	Rope, tent lay.
MIL-W-530E	Webbing, textile, cotton.
MIL-R-1607C, Type 1	Treatment mildew resistant for rope.

156 Fungicides, Biocides and Preservatives

MAAG AGROCHEMICALS, INC.: NYTEK 10WP:

An Industrial Fungicide to Control Mold and Mildew

Active Ingredient

Copper-8-Quinolinolate

10%

Inert Ingredients

90%

EPA Reg. No. 35977-18

EPA Est. No. 33766-IN-01

A Fungicide to Control Wood Decay

Description: Nytek 10WP is a water repellent formulation of copper-8-quinolinolate designed for the treatment of lumber by the dip or pressure process to control wood decay. For below ground use Nytek 10 WP will help prevent attack by wood boring beetles such as *Anobium punctatum* *Hylotrupes bajalus* and *Lyctus brunneus*. It will also help prevent attack by termites.

A Fungicide for Industrial Cotton Fabrics to Prevent Mold and Mildew

Description: For treating cotton duck, cotton webbing, rope and similar items which require copper-8-quinolinolate as the fungicide. Following is a partial list of Federal Specifications calling for the use of copper-8-quinolinolate as the mold inhibitor:

MIL-D-504-C, Class B

Dyeing and after treatment Processes for Cotton Duck and Twill.
Rope, Tent Lay.

MIL-R-1670

Webbing, Textile, Cotton

MIL-W-530E

MIL-R-1607C, Type 1

Treatment Mildew Resistant for
Rope

MAAG AGROCHEMICALS, INC.: NYTEK 645 Penetrant Sealer:

Active Ingredient:

Copper-8-Quinolinolate 1%

Inert Ingredients: 99%

EPA Reg. No. 35977-14

EPA Est. No. 33766-IN-01

Function and Applications

Containing copper-8-quinolinolate as the active ingredient, NYTEK 645 Penetrant Sealer is a ready-to-use, water-repellent preservative formulated to prevent the growth of fungi on interior structural materials inside food processing plants.

NYTEK 645 can be brushed or sprayed onto wood, concrete block tile and masonry used for walls, ceilings, floors and other structural materials which support the growth of unsanitary mold or mildew.

158 Fungicides, Biocides and Preservatives

MAAG AGROCHEMICALS, INC.: NYTEK WD:

Active Ingredient:

Copper-8-Quinolinolate 10%

Inert Ingredients 90%

Contains 0.90 lb. active ingredient per gallon

EPA Reg. No. 35977-20

EPA Est. No. 37429-GA-01

Mold and Mildew Inhibitor for Paints and Adhesives

Mildew Inhibitor for Paper, Paperboard and Textiles

A Fungicide to Control Wood Decay

MALLINCKRODT, INC.: Products for Horticulture:

Product Name:

BANROT:

Broad Spectrum Fungicide 40% Wettable Powder

For control of damping-off, root and stem rot diseases caused by Pythium, Phytophthora, Rhizoctonia, Fusarium and Thielaviopsis in ornamental and nursery crops.

- Combines the effectiveness of TRUBAN against Pythium and Phytophthora with the systemic activity of Dimethyl 4, 4-o-phenylenebis (3-thioallophanate) against Fusarium, Rhizoctonia, and Thielaviopsis.
- More economical. Cost in use is a fraction of that for other fungicides which may have a lower per pound price but require multiple applications for control.
- Fungicidal, not just fungistatic. BANROT kills the organism rather than simply suppressing it.
- Eliminates separate fungicides, which may not be compatible, to obtain broad spectrum disease control.
- Long lasting. Due to the residual qualities of BANROT'S components it reduces number of applications needed for control.

Active Ingredients

5-Ethoxy-3-trichloro-methyl-1,2,4-thiadazole	15%
Dimethyl 4,4'-o-Phenylenebis (3-thioallophanate)	25%

Inert Ingredients	60%
-------------------	-----

EPA Registration No. 372-46

EPA Establishment No. 228-IL-1

160 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product Name:

MILBAN Brand Mildew Fungicide

39% Emulsifiable Concentrate for Control of Powdery Mildew

- Outstanding effective in eradicating powdery mildew.
- Suppresses subsequent formation of powdery mildew.
- Non-phytotoxic to more than 200 varieties of roses.
- Leaves no visible sprays spots on foliage.
- Gives American growers an advantage foreign growers have had for years.
- Developed expressly for commercial rose growers.
- Proven in use by professional growers.

Active Ingredient:

4-Cyclododecyl-2,6-Dimethyl-morpolinium Acetate* 39%

Inert Ingredients: 61%

* Dodemorph acetate

EPA Est. No. 602-MO-1

EPA Registration No. 372-51

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product Name:

ORNALIN Contact Fungicide 50% Wettable Powder
For Control of Diseases on Ornamental Plants

- Especially effective against Botrytis (Gray Mold). ORNALIN stops the fungus even after a plant is infected, preventing further plant disfigurement.
- First Mallinckrodt fungicide labeled for use in bulb or corm crops. ORNALIN is also a special fungicide for use with ornamental herbaceous and woody plants. It works in the greenhouse or outdoors.
- No unsightly residue. And ORNALIN is particularly adaptable for programmed usage.
- Proven performance in Europe. For the past five years in Europe, ORNALIN has beaten all competitors in commercial use application.
- Does not inhibit root growth on cuttings taken from stock blocks which have been treated with ORNALIN.
- Low mammalian toxicity.
- Economical. Mix just .5 to 1 lb. of ORNALIN per 100 gallons of water. It offers excellent mixing qualities.

Active Ingredient:

3-(3,5-dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidione

50%

Inert Ingredients:

50%

Total:

100%

EPA Reg. No. 372-56
EPA Est. No. 602-MO-1

162 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product:

TRUBAN 5-G Fungicide:

For control of damping-off root and stem rot diseases caused by Pythium and Phytophthora in ornamental and nursery crops.

- Eliminates need for initial drenching.
- Easy to incorporate - thorough distribution mix maximizes protection.
- Compatible with other granular materials for application purposes.
- Ideal for newly potted or shifted plant materials.
- No skips from careless drenching. Every pot is protected.
- Can be used in greenhouses or outdoors, with bedding plants and on unrooted cuttings in propagation bed.
- Cost-in-use is comparable to, or less than, drenching.

Active Ingredient:

5-Ethoxy-3-trichloro-methyl-1,2,4-thiadiazole*

5%

Inert Ingredients:

95%

EPA Reg. No. 372-52

EPA Est. No. 228-IL-1

MALLINCKRODT, INC: Products for Horticulture(Continued):

Product Name:

TRUBAN Flowable

Fungicide for control of damping off root and stem rot diseases causes by Pythium and Phytophthora in ornamental and nursery crops.

- Easy to use and store - a convenient quart!
- "Warning" label only - a super safe product.
- Although "semi-liquid" it is off the "danger" list.
- After original mixing in the tank, it does not need constant agitation.
- Works beautifully at very low rates; a more than acceptable cost-in-use.
- Higher active ingredient concentration means a smaller solvent amount - greater safety to your plants.

Active Ingredient:

5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole* 40.7%

Inert Ingredients: 59.3%

* Licensed under U.S. Patents 3,260,588 & 3,260,725

EPA Reg. No. 372-59

EPA Est. No. 1258-MS-1

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product Name:

TRUBAN Fungicide 25% Emulsifiable Concentrate

For prevention and control of damping-off, root and stem rot diseases caused by Pythium and Phytophthora in ornamental and nursery crops.

- More economical. Cost in use is a fraction of that of other fungicides which may have a lower per pound price but require multiple applications for control
- Fungicidal, not fungistatic. TRUBAN kills disease organisms, doesn't merely suppress them.
- Requires little or no agitation after the initial mixing.
- Stronger root systems. TRUBAN-treated plants are rapid growers, of high quality and may be marketed earlier.
- Stable in sunlight. Apply TRUBAN during any suitable portion of the day without loss of effectiveness. No need to protect solutions from light.

Active Ingredients:

5-Ethoxy-3-trichloro-methyl-1,2,4-thiadiazole* 25%

Inert Ingredients: 75%

* Licensed under U. S. Patents 3,260,588 and 3,260,725

EPA Reg. No. 372-44

EPA Est. No. 228-1L-1

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product Name:

TRUBAN Fungicide 30% Wettable Powder

For prevention and control of diseases caused by Pythium and Phytophthora in ornamental and nursery crops.

- Economical. Cost in use is a fraction of that of other fungicides which may have a lower per pound price but require multiple applications for control
- Fungicidal, not fungistatic. TRUBAN kills disease organisms, doesn't merely suppress them.
- Long-lasting. TRUBAN reduces the number of applications needed for control.
- Stronger root systems. TRUBAN-treated plants result in high-quality, rapid growing plants that can be marketed earlier.
- Stable in sunlight. Apply TRUBAN during any suitable portion of the day without loss of effectiveness. No need to protect solutions from light.

Active Ingredient:

5-Ethoxy-3-trichloro-methyl-1,2,4-thiadiazole* 30%

Inert Ingredients: 70%

* Licensed under U.S. Patents 3,260,588 and 3,260,725

EPA Reg. No. 372-43

EPA EST. No. 228-IL-1

166 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Products for Horticulture(Continued):

Product Name:

ZYBAN

Broad Spectrum Systemic-Contact Fungicide for Ornamental
and Nursery Crops

- Immediate contact action plus long-lasting systemic control.
- Two types of fungicide are scientifically proportioned for maximum effectiveness.
- Synergistic action provides a higher level of control because the combined effect is greater than the sum of the individual components.
- Economical. You use less ZYBAN than you would use if you applied each fungicide separately.
- Eliminates the uncertainties of "homemade" tank mixes.

Active Ingredients:

Thiophanate-methyl (Dimethyl[1,2-phenylene) bis (imino-carbonothioyl)] bis [carbamate])	15%
A coordination product of zinc ion and manganese ethylenebis dithiocarbamate	60%
in which the ingredients are:	
Manganese(Mn)++	12%
Zinc(Zn)++	1.5%
Ethylenebis dithiocarbamate	46.5%

Inert Ingredients:

Total:	25%
	100%

EPA EST. NO. 228-IL-1

EPA Reg. NO. 372-48

MALLINCKRODT, INC.: Turf Products:

Product Name:

CADMINATE

Cadmium Turf Fungicide for control of dollar spot, red thread, copper spot, and snow mold.

- Provides extremely long residual control. Only one application needed per month for preventive control of labeled summer diseases.
- No known phytotoxicity to finest golf course turf.
- Effective and economical for fairway dollar spot control.
- Easy to use - formulated for quick, complete mixing in golf course spray equipment.
- Labeled for summer and winter disease control.

Active Ingredient

Cadmium Succinate	60%
(Total cadmium (Cd).....29%)	
Inert Ingredients	40%

EPA Registration No. 372-15

EPA Est. No. 228-IL-1

168 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

CALO-CLOR

Wettable powder Mercurial Turf Fungicide, for control of snow-mold disease complex.

- Proven superior in University tests.
- One application needed per season for Snow Mold control under normal conditions.
- Excellent suspendibility, uniform dispersion and spray coverage.
- Apply as a spray or dry, mixed with sand or sewage sludge.

Active Ingredients:

Mercurous Chloride	60%
Mercuric Chloride	30%

Inert Ingredients:	10%
Total:	100%

Contains 73% Total Mercury (Hg)

EPA Reg. No. 372-5

EPA Est. No. 5383-NJ-1

EPA Est. No. 372-PA-1

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

CALO-GRAN

Granular Mercurial Turf Fungicide for control of snow mold disease.

- Effectiveness proven under severe winter conditions.
- Spreader application - very low dust content.
- Calcined clay base - spreads uniformly, doesn't wash away.
- Economical - one application lasts a season.
- Safe for turf.
- Granular formulation of CALO-CLOR - 2 lb of CALO-GRAN is equivalent to 1 oz of CALO-CLOR.

Active Ingredients:

Mercurous Chloride	1.8%
Mercuric Chloride	0.9%
(Total Mercury (as Hg)..2.2%)	

Inert Ingredients 97.3%

E.P.A. Registration No. 372-33AA

E.P.A. Est. No. 372-PA-1

170 Fungicides, Biocides and Preservatives

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

DUOSAN

Broad spectrum systemic-contact turf fungicide for control of most major spring and summer diseases.

- Now labeled for use on ornamental trees, shrubs, and flowers.
- Controls Dollar Spot, Brown Patch, Copper Spot, Red Thread, Fusarium Patch, Rust...even troublesome Leaf Spots.
- Scientifically formulated for compatibility and maximum effectiveness.
- Synergistic action provides a higher level of control than can be achieved by using each component separately.
- Immediate contact action plus long-lasting systemic control.
- Combination reduces probability of resistance developing.

Active Ingredients

Thiophanate-methyl (Dimethyl [1,2-phenylene) bis (imino-carbonothioyl)] bis [carbamate]) 15%
A coordination product of zinc ion and manganese ethylene-bis dithiocarbamate 60%

in which the active ingredients are:

Manganese (Mn) ++	12%
Zinc (Zn) ++	1.5%
Ethylenebis dithiocarbamate	46.5%

Inert Ingredients	25%
Total	100%

EPA Est. No. 228-IL-1

EPA Reg. No. 372-48

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

FUNGO 50

Broad-spectrum systemic fungicide for control of Fusarium blight, dollar spot, brown patch, copper spot, red thread, stripe smut, Fusarium patch, and anthracnose.

- Excellent control of eight turf diseases.
- Systemic - provides longer period of control than organic contact fungicides.
- High safety factor - will not damage or discolor most grasses.
- Compatible with KOBAN - can be tank-mixed for broad-spectrum summer disease control including Pythium blight.
- Effective on Anthracnose in University tests.

Active Ingredient:

Dimethyl 4,4'-o-phenylenebis(3-thioallophanate)* 50%

Inert Ingredients: 50%

Total 100%

EPA Registration No. 372-45

EPA Establishment No. 228-IL-1

172 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

KOBAN 1.3G

Granular turf fungicide for control of Pythium blight.

- Provides thorough coverage at label rates.
- Convenient, easy-to-use granular formulation.
- Can be applied using light, inexpensive equipment - without interrupting play.
- No watering required.
- Lets you give selective treatment to "problem" greens quickly and easily.
- Every bit as effective as KOBAN 30 spray - proven in use over many years.

Active Ingredient

5-Ethoxy-3-trichloro-methyl-1,2,4-thiadazole* 1.3%

Inert Ingredients 98.7%

* Licensed under U.S. Patent No. 3,260,588 and 3,260,725

EPA Reg. No. 372-55

EPA Est. No. 228-IL-1

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

KOBAN 30

Turf fungicide for control of Pythium blight.

- New low preventive application rate.
- Proven effective in control of Pythium blight.
- Control continues even under prolonged, adverse weather conditions.
- Economical. Compare cost per 1000 sq ft per week.
- Controls up to a full week or more per application.
- Effective as a seed treatment for good germination.
- No reported resistance after many years of use.

Active Ingredient

5-Ethoxy-3-Trichloromethyl-1,2,4-Thiadiazole* 30%

Inert Ingredients 70%

* Licensed under U.S. Patent No. 3,260,588 and 3,260,275

EPA Registration No. 372-34

EPA Establishment No. 228-IL-1

174 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

KOBAN Flowable

Turf Fungicide for Preventive and Curative Control of Pythium Blight.

- Excellent control of Pythium blight.
- Easy to handle.
- Preventive and curative control.
- Economical to use.
- Stable formulation with minimal settling.
- No dusting or mixing problems.

Active Ingredient

5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole*

40.7%

Inert Ingredients

59.3%

Contains 4 lb Active Ingredient per Gal.

* Licensed under U. S. Patents 3,260,588 & 3,260,725

EPA Reg. No. 372-58

EPA Est. No. 1258-MS-1

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

KROMAD

Broad-spectrum turf fungicide for control of brown patch, dollar spot, copper spot, red thread, Helminthosporium and Curvularia leaf spot.

- Extended record of effectiveness as a preventive and curative contact fungicide.
- Combination of fungicidal and non-fungicidal ingredients valuable in maintaining healthy vigorous turf.
- Temporary colorant added as a guide for uniform application.
- Long history of safe use on fine turf even under conditions of high temperature and extreme humidity.

Active Ingredients

Cadmium Sebacate	5%
Potassium Chromate	5%
Thiram (Tetramethylthiuram Disulfide)	16%
(Total Cadmium(Cd).....1.6%)	
(Total Chromium(Cr).....1.3%)	

Inert Ingredients 74%

Urea - Ferrous Sulfate - Wetting Agent

EPA Registration No. 372-24

EPA Est No. 44946-MO-1

176 *Fungicides, Biocides and Preservatives*

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

THIRAMAD

Turf fungicide for control of brown patch, dollar spot and snow mold.

- Tracer colorant included for accurate application.
- Long record of effectiveness in control of turf diseases.
- Superior formulation - easily dispersed wettable powder.

Active Ingredients

Thiram (Tetramethylthiuram Disulfide)

75%

Inert Ingredients

25%

EPA Registration No. 372-26

EPA Est. No. 602-MO-1

MALLINCKRODT, INC.: Turf Products(Continued):

Product Name:

VORLAN

Turf Fungicide for the prevention or control of dollar spot (even resistant strains), leaf spot, red thread, and pink snow mold.

New Chemistry to Solve Resistant Dollar Spot Problems

- Use a preventive or curative.
- Safe on all common turfgrasses.
- Provides long-lasting control.
- Excellent results in field and University trials.
- New low rates for economical control.

Active Ingredient:

3-(3,5-dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidine-
dione

50%

Inert Ingredients:

50%

Total

100%

EPA Reg. No. 372-56

EPA Est. No. 602-MO-1

178 Fungicides, Biocides and Preservatives

MILLER CHEMICAL & FERTILIZER CORP.: Fungicides:

Product Name:

BENOMYL 50W Systemic Fungicide

Provides Curative and Protective Action for Certain Plant

Diseases

- Turf
- Flower
- Vegetables
- Ornamental
- Bulbs

Active Ingredient:

Benomyl [Methyl 1-(butylcarbamoyl)-2-
2-benzimidazole-carbamate]

By Weight

50%

Inert Ingredients:

Total

50%

100%

U.S. Pat. Nos. 3,541,213 and 3,631,176

EPA Reg. No. 904-224-2125

EPA Est. No. 2125-IL-1

Lime Sulfur Solution

Fungicide-Insecticide-Miticide

Active Ingredient:

Calcium Polysulfide

By. Wt.

29%

Inert Ingredients:

71%

EPA Reg. No. 72-19

EPA Est. No. 72-WV-1

MANEB Garden Fungicide

Controls Blight, Anthracnose, Leaf Spot and certain other
diseases on Tomatoes and on other Vegetables, Fruit, Flowers
as listed

Active Ingredient:

Maneb (Manganese ethylene bisdithiocarbamate)

80%

Inert Ingredients:

20%

Total

100%

EPA Reg. No. 2125-50

EPA Est. No. 2125-IL-1

MOBAY CHEMICAL CORP.: BAYLETON Fungicide:

Product Name:

BAYLETON
50% Wettable Powder Fungicide

For control of specified diseases on certain field, fruit, and vegetable crops.

Only for agricultural use, or for sale to, use, and storage by commercial applicators, and other servicepersons.

BAYLETON 50% Wettable Powder is a unique fungicide which has the ability to control, as well as prevent, certain important fungus diseases, including rusts, powdery mildew and black rot in wheat, barley, grapes, apples, pineapples, pears, pine seedlings, and grasses grown for seed.

BAYLETON 50% Wettable Powder is absorbed rapidly and works systemically from within the plant.

BAYLETON 50% Wettable Powder mixes readily with water to form a suspension that can be used in all conventional hand- and machine-operated sprayers.

- Provides systemic residual control
- Stops development of rust pustules on grasses grown for seed
- Has preventive and curative properties
- Can be used at very low rates
- Won't damage foliage
- Compatible with other fungicides and insecticides

Ingredients

Active Ingredient	
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone	50%
Inert Ingredients	50%
	100%

U.S. Patent No. 3,912,752

EPA Reg. No. 3125-320

MOONEY CHEMICALS, INC.: M-GARD Registered Wood Preservatives:

Product Name:

M-GARD W110
EPA Reg. No. 9630-8

M-GARD S120
EPA Reg. No. 9630-5

M-GARD W150
EPA Reg. No. 9630-7

M-GARD S150
EPA Reg. No. 9630-6

Latest technological developments have yielded a full line of Registered M-GARD products designed to replace pentachlorophenol and creosote for various wood preservative applications.

Benefits of M-GARD W110 and M-GARD W150

- Safety
Registered with the EPA for both formulating and end use applications.
- Versatility
Can treat green (wet) wood as well as dry wood. Controls both fungi and termites.
- Cost/Effectiveness
Brush, spray, dip or pressure. Will accept stain, varnish, paint. Soap and water clean-up.
- Proven Performance
True penetrating wood preservatives that greatly extend the useful life of the wood.
- Labels
Mooney can assist you in obtaining registrations for end use and full regulatory compliance.

MOONEY CHEMICALS, INC.: M-GARD W550:

Colorless Liquid Wood Preservative

A new water reducible system developed to deliver an environmentally safe, historically-proven preservative for green or dry wood.

- Non-Toxic
- Non-Leaching
- Non-Corrosive
- Cost/Effective
- Controls Fungi and Insects
- Treats Green or Dry Wood
- Diffuses into the Wood
- Accepts Paint and Varnish

History of M-GARD W550 Wood Preservative

For many years, zinc naphthenate has been used as a wood preservative. Underground stake tests initiated by the USDA Forest Products Laboratory back in 1941 illustrated zinc naphthenate's outstanding performance as such.

Since Mooney Chemicals has had long experience (since 1946) in the manufacture and marketing of solvent-based zinc naphthenate, it undertook the development of a water-borne preservative employing the same high-performing, low-toxicity primary active ingredient. The water-emulsion concentrate, M-GARD W550, was developed as a result, and is rapidly becoming a preferred product for the preservation of log homes and all other above-ground wood treatments. The U.S. Army has recently rewritten their Military Specifications for ammunition boxes and pallets calling for M-GARD W550 to replace pentachlorophenol effective October 1, 1984!

EPA Reg. No. 9630-10

182 *Fungicides, Biocides and Preservatives*

MOONEY CHEMICALS, INC.: Mooney M-GARD S520:

A Safe, Long-Term Wood Preservative to Answer Today's Environmental Concerns.

Minimizes hazardous waste disposal and regulatory compliance problems.

What is It?

M-GARD S520 is an oil-soluble, copper naphthenate-based wood preservative that can be employed with a high degree of safety. It substantially reduces the problems of environmental liability through a unique technique of copper naphthenate chemistry and application. It provides an ideal fungicide and insecticide for the long-term preservation of wood in contact with the ground.

Why Mooney M-GARD S520 is the Ultimate Solution

1. Commercially available and registered with EPA (#9330-12).
2. Minimizes environmental health risks because it contains no pentachlorophenol, other chlorinated phenols, mercury, creosote, chrome or arsenic. Can be used with a high degree of safety around people, farm animals, wildlife and plants. It is also non-blooming.
3. Permanent protection. Fixation in the wood holds the active ingredient and provides a service life of at least 35 years, depending on the wood species, treating methods, service conditions and maintenance programs.
 - Preserves wood by controlling wood destroying fungi and insects.
 - Repells water which reduces the decaying process.
4. Easy to apply, with no licensed applicator needed.
 - Treating choices: pressure, dip, spray or brush. Non sludging.
5. Lower installation and maintenance costs.
 - Clean, non-corrosive, non-conductive
6. A color range of the treated wood from chocolate to dark green is possible, depending on the treating process.
7. Lower overall costs--The combination of permanent protection and the net effect of minimizing hazardous waste disposal cleanup, regulatory compliance and insurance provides the ultimate solution for wood preservation.

MOONEY CHEMICALS, INC.: Registered Fungicides:

Copper and zinc naphthenate based products can be safely used as fungicidal treatments for woods, canvas, jute, cork, burlap, cotton, hemp, etc. They offer outstanding resistance to cellulose rotting fungi, termites and wood-boring insects adding years of service to these items.

Product Name:

8% COPPER NAP-ALL
EPA Reg. No. 9630-5

6% COPPER NAP-ALL
EPA Reg. No. 9630-4

Copper Naphthenate has long been known to be one of the most effective preservative treatments for textiles and wood. COPPER NAP-ALL comes in concentrated form, either a 6% or 8% copper metal in solution. This concentrate is normally diluted with a volatile solvent, such as mineral spirits, to a 2% Copper solution. Application can be made by dipping, spraying, brushing or pressure treating.

8% ZINC NAP-ALL
EPA Reg. No. 9630-6

While Zinc Naphthenate is slightly less efficient than Copper Naphthenate as a textile or wood fungicide, since it is colorless, this factor makes it the logical choice for many applications. Like COPPER NAP-ALL, ZINC NAP-ALL comes to you in a concentrated solution containing 8% Zinc as metal. Application can be made by dipping, spraying, brushing or pressure treating.

184 Fungicides, Biocides and Preservatives

MORTON THIOKOL, INC.: CUNILATE Fungicides:

Product Name:

CUNILATE 2419

Fungistatic Treatment for Paperboard, Kraft Paper and Industrial Textile Applications

PRODUCT DESCRIPTION

CUNILATE 2419 is a nonionic emulsion concentrate containing 10% solubilized copper 8-quinolinolate. CUNILATE 2419 is used as a fungicide in the treatment of kraft paper, paperboard, and as a mildewproofing agent for textiles.

EPA REGISTRATION NO.:
2829-12

EPA ESTABLISHMENT REG. NO.:
2829-1L-1

CUNILATE 2174-NO

PRODUCT DESCRIPTION

CUNILATE 2174-NO is recommended for formulation into paints, protective coatings and adhesives to produce products which are highly resistant to fungal growth.

Copper 8-quinolinolate 10% completely solubilized

EPA REGISTRATION NO.:
2829-44

CUNILATE 2419-75

Fungistatic Treatment for Paperboard, Kraft Paper and Textiles for Protection against Mildew and Decay Fungi

CUNILATE 2419-75 is an anionic emulsion concentrate, especially designed to be easily diluted with water for application to paperboard used in the manufacture of shoe counters, agricultural mulch paper and heavy cellulosic fabrics for tents, awnings, tarpaulins, etc.

The excellent durability of copper 8-quinolinolate is well recognized by government agencies who require that it be used as the preferred fungistat in many military specifications for the control of mildew and decay fungi.

EPA REGISTRATION NO.
2829-112

MORTON THIOKOL, INC.: CUNIPHEN Fungistatic Treatment for
Textiles:

Product Name:

CUNIPHEN 2713
CUNIPHEN 2721
CUNIPHEN 2721-C
CUNIPHEN 2762

The CUNIPHEN products are textile treating systems specifically formulated for imparting a long-lasting fungistatic treatment to cotton duck, poplin, webbing, muslin, sheeting or wool felt. They are available in both solvent and emulsion forms, which are readily diluted to form stable treatment baths. These products contain the active ingredient, 2,2'-methylenebis (4-chlorophenol).

CUNIPHEN 2713 contains effective water repellents and is formulated for solvent system application. CUNIPHEN 2721 and 2721C are emulsions designed to be compatible with many acid-wax water repellents, allowing mildewproofing and water repellent application in a single treatment.

CUNIPHEN 2762 is formulated with high performance water repellents enabling a textile treater to meet hydrostatic pressure requirements.

EPA REGISTRATION NUMBER

CUNIPHEN 2713	2829-23
CUNIPHEN 2721	2829-30
CUNIPHEN 2721-C	2829-113
CUNIPHEN 2762	2829-35

186 Fungicides, Biocides and Preservatives

MORTON THIOKOL, INC.: CUNIPHEN 2778-I:

CUNIPHEN 2778-I is a special formulation of 2,2'-methylenebis(4-chlorophenol) especially designed for use in the preservation of glues and adhesives.

CUNIPHEN 2778-I is a liquid concentrate, easily dispersible in glues, adhesives and resin emulsions, and is recommended where an effective preservative is required.

The active ingredient of CUNIPHEN 2778-I has been approved for use in adhesives, paper, and paper board products used in contact with aqueous, fatty and dry foods.

EPA REGISTRATION NUMBER

2829-36

CANADIAN REGISTRATION NUMBER

12315

MORTON THIOKOL, INC.: DUROTEX Antimicrobials:

Fungistatic and Bacteriostatic Emulsions for Protecting Textile and Adhesive Products

Product Series

DUROTEX 7599
DUROTEX 7603
DUROTEX 7604

DESCRIPTION

DUROTEX antimicrobials are highly effective emulsion concentrates formulated for incorporation into textiles, non-food grade glues and adhesives, latexes, and similar products. VENTRON Division's DUROTEX product series offers a unique range of emulsion systems for maximum compatibility with a wide range of textile treatment baths and adhesive formulae. DUROTEX treated products provide protection against deterioration, staining, and unsightly changes in surface appearance caused by bacterial or fungal attack.

Many commercial water repellent formulations, as well as binders such as polyvinyl acetate or acrylics, are compatible with the DUROTEX antimicrobial and will enhance the durability of the system.

Susceptible products successfully protected with DUROTEX antimicrobials include:

Adhesives (non-food grade)	Base fabrics for vinyl coated constructions
Glues (non-food grade)	
Ink bases	Awning and tarpaulin fabrics
Latex emulsions	Mattress ticking
Wallpaper constructions	Pipe wrapping fabrics

EPA REGISTRATION NO.:	
DUROTEX #7599	2829-89
DUROTEX #7603	2829-90
DUROTEX #7604	2829-91

DUROTEX GPM

GENERAL DESCRIPTION

The DUROTEX GPM treatment involves a mixture of two resin concentrates (DUROTEX GPM and trimethylolmelamine) which, when properly applied with a catalyst will inhibit the development of bacterial and mildew (fungus) odors on textiles and provide hygienic freshness. DUROTEX GPM is recommended as a treatment for shoe innersoles and liner fabrics.

Note: Claims for end items treated with DUROTEX GPM cannot exceed those on the DUROTEX GPM label and must not imply protection of surfaces or articles other than the treated fabric.

EPA REGISTRATION NO.:	
	2829-81

188 *Fungicides, Biocides and Preservatives*

MORTON THIOKOL, INC.: SOCCI Fungistatic Treatments:

Product Name:

SOCCI 3500 Fungistatic Treatment for Industrial Textiles Applications:

Product Description

SOCCI 3500 is a 10% formulation of solubilized copper 8-quinolinolate. SOCCI 3500 can be used, in solvent applications, for the mildewproofing of textiles and can be diluted with common organic solvents such as mineral spirits, stoddard solvent or naphtha. Where fast drying is required, VMP naphtha or an aromatic similar to xylol is suggested. Compatible waxes, flame retardants, organosols and other textile treatments can also be used in combination with SOCCI 3500 to achieve the desired finish.

EPA REGISTRATION NO.:
2829-49

SOCCI 3500-WP Fungistatic/Water Repellent Treatment for Industrial Textile Applications

DESCRIPTION

SOCCI 3500-WP is a 10% formulation of solubilized copper 8-quinolinolate in combination with waxes and water repellent agents. It is designed for solvent applications where mildewproofing and water repellency are to be applied in a single treatment.

EPA REGISTRATION NO.:
2829-42

SOCCI 30 Fungistatic Treatment for Rope and Cordage

DESCRIPTION

SOCCI 30 is a stable formulation of copper 8-quinolinolate dispersed in cordage oil. It is readily dilutable with oil formulations to meet the requirements of the manufacturer. A thixotropic paste which is miscible with toluol, xylol and high flash naphtha, SOCCI 30 can be incorporated into formulations consisting of cordage oil, wax and stearates.

EPA REGISTRATION NO.:
2829-87

CANADA REGISTRATION NO.
13085

MORTON THIOKOL, INC.: VINYZENE Antimicrobials:

Product Series:

- BP-5-2
- BP-5-2DIDP
- BP-5-2DOP
- BP-5-2PG
- BP-5-2S-160
- BP-5-2U

DESCRIPTION

VINYZENE antimicrobials are solutions of 10,10'-oxybisphenoxarsine (OBPA) in selected non-volatile plasticizer carriers. They are recommended for PVC, polyurethane and other plastics and synthetic rubbers. Low concentrations of VINYZENE antimicrobials will provide long-term protection against a broad spectrum of bacterial and fungal attack and will help prevent surface growth, musty odors, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE antimicrobials are recommended for film and sheeting, extruded profiles, plastisols, molded goods, organosols, fabric coatings and similar systems requiring an effective antimicrobial compound. These solutions are compatible with most polymer formulations and will not discolor or detract from the protected product's chemical or physical properties. VINYZENE products can be conveniently incorporated into the formulation.

Properly formulated plastics with VINYZENE protection will resist microbiological deterioration after long-term exposure to heat and severe weathering conditions.

EPA REGISTRATION NUMBER

BP-5-2	EPA 2829-96
BP-5-2DIDP	EPA 2829-96
BP-5-2DOP	EPA 2829-96
BP-5-2PG	EPA 2829-96
BP-5-2S-160	EPA 2829-96
BP-5-2U	EPA 2829-96

190 Fungicides, Biocides and Preservatives

MORTON THIOKOL, INC.: VINYZENE Antimicrobials: Antimicrobial Additives for Plastics:

Product Series:

BP-5
BP-5 DIDP
BP-5 DOP
BP-5 RG
BP-5 S-160

DESCRIPTION

VINYZENE antimicrobials are solutions of 10,10'-oxybisphenoxarsine (OBPA) in selected non-volatile plasticizer carriers. They are recommended for PVC, polyurethane and ethylene-vinyl-acetate copolymer formulations. Low concentrations of VINYZENE antimicrobials will provide long-term protection against a broad spectrum of bacterial and fungal attack and will help prevent surface growth, musty odors, permanent staining, embrittlement and premature product failure.

APPLICATIONS

VINYZENE antimicrobials are recommended for film and sheeting, extruded profiles, plastisols, molded goods, organosols, fabric coatings and similar systems requiring an effective antimicrobial compound. These solutions are compatible with most polymer formulations and will not discolor or detract from the protected product's chemical or physical properties. VINYZENE products can be conveniently incorporated into the formulation.

Properly formulated plastics with VINYZENE protection will resist microbiological deterioration after long-term exposure to heat and severe weathering conditions.

EPA REGISTRATION NUMBER

BP-5	EPA 2829 - 82
BP-5 DIDP	EPA 2829 -102
BP-5 DOP	EPA 2829 -104
BP-5 RG	EPA 2829 - 82
BP-5 S-160	EPA 2829 - 82

MORTON THIOKOL, INC.: VINYZENE Antimicrobials: Antimicrobial Additives for Plastics (Continued):

Product Series:

BP-5-2 MEK
BP-5-2 MS

DESCRIPTION

VINYZENE BP-5-2 MEK and BP-5-2 MS are antimicrobial solvent solutions of 10,10'-oxybisphenoxarsine (OBPA). They are recommended for PVC, polyurethane and other polymeric compounds requiring protection against microbiological deterioration. Low levels of BP-5-2 MEK or BP-5-2 MS will provide long term protection against bacterial and fungal attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE BP-5-2 MEK and BP-5-2 MS are recommended for organosols, plastisols, solvent solution coatings, adhesives and sealants. Plastic compounds protected with BP-5-2 MEK and BP-5-2 MS include coatings for fabrics; metal and wood; automotive and construction sealants; adhesives; and other products subject to microbiological deterioration.

BP-5-2 MEK and BP-5-2 MS are equally effective in their antimicrobial activity and differ only in the solvent carrier. BP-5-2 MEK is recommended for systems requiring a polar solvent and BP-5-2 MS where mineral spirits is compatible with the resin solution. VINYZENE antimicrobials are also available as 1% and 2% active solutions in various plasticizers, and as emulsions for latex and water based systems.

VINYZENE BP-5-2 MEK and BP-5-2 MS provide effective protection against a broad spectrum of bacteria and fungi. They are particularly active against the common microorganisms that stain and permanently discolor flexible vinyl products and coatings. Low levels of VINYZENE will help prevent unsightly surface fungal growth and reduce musty odors.

EPA Registration Number

BP-5-2 MEK	2829-110
BP-5-2 MS	2829-109

192 Fungicides, Biocides and Preservatives

MORTON THIOKOL, INC.: VINYZENE Antimicrobials: Bacteriostatic and Fungistatic Additives for Plastic Compounds

Product Series:

BP-505
BP-505 DIDP
BP-505 DOP
BP-505 PG
BP-505 S160

DESCRIPTION

VINYZENE antimicrobials are solutions of 10,10'-oxybisphen-oxarsine (OBPA) in selected non-volatile plasticizer carriers. They are recommended for PVC, polyurethane and other plastics and synthetic rubbers. Low concentrations of VINYZENE antimicrobials will provide long-term protection against a broad spectrum of bacterial and fungal attack and will help prevent surface growth, musty odors, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE antimicrobials are recommended for film and sheeting, extruded profiles, plastisols, molded goods, organosols, fabric coatings, and similar systems requiring an effective antimicrobial compound. These solutions are compatible with most polymer formulations and will not discolor or detract from the protected product's chemical or physical properties. VINYZENE products can be conveniently incorporated into the formulation.

Properly formulated plastics with VINYZENE protection will resist microbiological deterioration after long-term exposure to heat and severe weathering conditions.

EPA Registration Number: 2829-125

MORTON THIOKOL, INC.: VINYZENE BP-5SIL3 Antimicrobial Additive
for Plastics:

Fungistatic and Bacteriostatic Agent for Silicone Caulking
Formulations

DESCRIPTION

VINYZENE BP-5SIL3 is a highly effective bacteriostatic and fungistatic agent especially designed for addition to silicone sealant formulations. It controls the wide range of organisms associated with fouling and discoloration of caulking compounds normally used in various household maintenance and repair applications.

VINYZENE BP-5SIL3 is recommended for use in all silicone systems requiring fungal control, other than those coming into direct contact with food products.

TYPICAL PROPERTIES

Sp. Gravity at 77F	.975 - .985
Wt. Per Gallon	8.17 lbs.
Appearance	Light straw colored solution
Active principle	3% 10, 10'-oxybisphenoxarsine
Carrier	Low viscosity dimethylsiloxane

EPA REGISTRATION NUMBER
2829-105

CANADIAN REGISTRATION NUMBER
15859

MORTON THIOKOL, INC.: VINYZENE SB-1 Antimicrobial Additive for Plastics:

DESCRIPTION

VINYZENE SB-1 is a concentrate of 10,10'-oxybisphenoxarsine (OBPA) in a polymeric resin carrier. The product, supplied as a homogeneous solid in pelletized form, is recommended for PVC, polyurethane and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 will provide long term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

The most commonly used methods for preserving plastics against fungal and bacterial attack are to add liquid solutions of additives (such as the VINYZENE BP-5 series) or to add pure active ingredient in powdered form. Such highly concentrated powders are often toxic and must be handled with extreme caution; they can present hazards to production personnel due to dusting problems and also can cause contamination of processing equipment.

EPA REGISTRATION NO.:
2829-115

U.S. Patent No. 4,086,297

MORTON THIOKOL, INC.: VINYZENE SB-1 EAA Antimicrobial Additive
for Plastics:

DESCRIPTION

VINYZENE SB-1 EAA is a concentrate of 10,10'-oxybisphenoxarsine (OBPA) in an ethylene-acrylic copolymer resin carrier. The product, supplied as a homogeneous solid in pelletized form, is recommended for polyolefins and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 EAA will provide long term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE SB-1 EAA can be incorporated into the polymer compound at any convenient stage of the manufacturing process. The product can be fed into an extrusion operation in much the same way as pelletized color concentrates.

EPA REGISTRATION NO.:

2829-115

U. S. Patent #4,086,297

MORTON THIOKOL, INC.: VINYZENE SB-1 ELV Antimicrobial Additive
for Plastics:

DESCRIPTION

VINYZENE SB-1 ELV is a 5% concentrate of 10,10'-oxybisphenoxarsine (OBPA) in ELVALOY resin. The product, supplied as a homogeneous solid in pelletized form, is recommended for polyolefins, synthetic rubbers and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 ELV will provide long term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE SB-1 can be incorporated into the polymer compound at any convenient stage of the manufacturing process.

EPA REGISTRATION NO.:
2829-115

U.S. Patent #4,086,297

MORTON THIOKOL, INC.: VINYZENE SB-1 NY Antimicrobial Additive
for Plastics:

DESCRIPTION

VINYZENE SB-1 NY is a concentrate of 10, 10'-oxybisphenoxarsine (OBPA) in a nylon resin carrier. The product, supplied as a homogeneous solid in pelletized form, is recommended for nylon and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 NY will provide long term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE SB-1 NY not only eliminates dusting problems but reduces the need for special handling. It is compatible with most nylon resins and will not discolor or detract from the product's chemical or physical properties.

EPA REGISTRATION NO.:
2829-115

MORTON THIOKOL, INC.: VINYZENE SB-1 PR Antimicrobial Additive
for Plastics:

DESCRIPTION

VINYZENE SB-1 PR is a concentrate of 10,10'-oxybisphenoxarsine (OBPA) in a polyolefinic resin carrier. The product, supplied as a homogeneous solid in pelletized form, is recommended for polyolefins and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 PR will provide long term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement and premature product failure.

APPLICATION

VINYZENE SB-1 PR not only eliminates dusting problems but reduces the need for special handling.

E.P.A. Registration No.: 2829-115

U.S. Patent #4,086,297

MORTON THIOKOL, INC.: VINYZENE SB-1 PS Antimicrobial Additive
for Plastics:

DESCRIPTION

VINYZENE SB-1 PS is a concentrate of 10, 10'-oxybisphenoxarsine (OBPA) in a polymeric resin carrier. The product, supplied as a homogeneous solid in a pelletized form, is recommended for polyolefins, polyurethane and other polymeric compositions requiring preservation against fungal and bacterial deterioration. Low levels of VINYZENE SB-1 PS will provide long-term preservation against fungal and bacterial attack and will help prevent surface growth, permanent staining, embrittlement, and premature product failure.

APPLICATION

VINYZENE SB-1 PS not only eliminates dusting problems but reduces the need for special handling.

E.P.A. REGISTRATION NO.
2829-115

U.S. Patent #4,086,297

200 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

FUNGITROL 11
Industrial Fungicide

EPA Registration No. 1100-70

General Description

FUNGITROL 11 is a powdered, low toxicity, non-metallic organic fungicide designed for use in non-aqueous coatings (paints) and caulking compounds. It demonstrates excellent performance in these substrates showing the following principal features:

1. Highly effective against a variety of microorganisms.
2. Suitable for use in both exterior and interior non-aqueous paints and caulking compounds.
3. Does not affect color or other paint and caulking properties.

Typical Properties

Physical Form	Off-white fine powder
Active Ingredient	88%
	Folpet-[N-(trichloromethylthio)phthalimide]
Odor	Slight burnt
Empirical Formula	C ₉ H ₄ NO ₂ SCl ₃
Molecular Weight	296.58
Melting Point	329-338F
Specific Gravity (25/25C)	1.75
Bulk Density	Loose: 18-20 lbs./cu.ft. Packed: 28-32 lbs./cu.ft.

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

FUNGITROL 11-50 Dispersion
Industrial Fungicide

EPA Registration No. 1100-78

General Description

FUNGITROL 11-50 Dispersion is a free flowing liquid dispersion which consists of 50% FUNGITROL 11 dispersed in an inert vehicle system composed of a broad spectrum dispersant and exempt mineral spirits. It was developed to provide a product with equivalent fungicidal activity to powdered FUNGITROL 11 but would be easier to process in paints. Dusting and dispersion problems would be eliminated. FUNGITROL 11-50 exhibits excellent shelf stability and is readily incorporated into paints by simple mixing procedures. Like FUNGITROL 11, FUNGITROL 11-50 Dispersion is for use as a fungicide in non-aqueous paints, coatings and caulking compounds.

Typical Properties

Physical Form	Off-white fluid dispersion
Active Ingredient	44%
Folpet-[N-(trichloromethylthio)phthalimide	
Weight/Gallon, (lb.)	9.75
Hegman grind	6+
Flash Point (PMCC)	104F

202 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

FUNGITROL TINOX

Brand of Bis(Tri-n-butyltin) oxide

EPA Registration No. 5204-1-1100

General Description:

FUNGITROL TINOX Preservative is a biologically active compound for use in wood preservation and in formulating micro-biocides, fungicides and anti-fouling coatings. It is extremely effective against a wide spectrum of wood destroying micro-organisms, insect and marine borers. Based on its ability to control wood rotting fungi and be handled safely, FUNGITROL TINOX preservative is receiving increased attention in treatment of millwork, siding and a variety of structural materials. FUNGITROL TINOX preservative is also widely used for other applications including water treatment, control of marine fouling, materials preservation and the prevention of fungal growth on coating films.

The advantages of FUNGITROL TINOX preservative are:

- Control of wood rotting fungi
- Low water solubility
- Adsorbed on celluloses (resists leaching)
- Colorless
- Does not cause swelling of wood
- Does not corrode metal
- Can be handled safely
- Readily formulated in solvent blends or in aqueous systems

Typical Properties

Physical Form:	Clear, straw colored liquid
Active Ingredient:	
Bis(tri-n-butyltin)oxide	96%
% Tin Content:	38.8
Molecular Weight:	596.0
Specific Gravity (25C/25C):	1.17
Lbs./Gal. (25C):	9.76
Boiling Point, C (at 2 mm):	Below -45
Flash Point, C (TCC):	Above 100
Viscosity, centistokes (25C):	4.8
Surface Tension, dynes/cm (25C)	30.6

NUODEX, INC.: Antimicrobials (Continued):

Product Name:

FUNGITROL Zinc 8% Fungicide
 EPA Reg. No. 1100-79

General Use Description:

FUNGITROL Zinc 8% Fungicide is a 60% zinc naphthenate solution containing 8% zinc as metal in exempt mineral spirits. It is designed for manufacturing use only in solvent applications for the formulation of other economic poisons. It is a violation of Federal law to use this product in a manner inconsistent with its label.

Physical and Chemical Properties:

Appearance	Amber, slightly viscous liquid
Active Ingredient	Zinc Naphthenate 60% (Zinc as metal, 8%)
Odor	Mild, mineral spirits odor
Viscosity Max. (25C)	Gardner N, max.
Specific Gravity (25C)	0.955-0.985
Lbs./Gallon (80F)	7.99-8.22
Flash Point 25C	104F Setflash

204 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

FUNGITROL Zinc 8% W.D. Fungicide
EPA Reg. No. 1100-79

General Use Description

It is a violation of Federal law to use this product in a manner inconsistent with its label. FUNGITROL Zinc 8% W.D. Fungicide is a 60% zinc naphthenate solution containing 8% zinc as metal in exempt mineral spirits. It is designed for manufacturing use only in the formulation of other economic poisons as water dispersions.

Physical and Chemical Properties

Appearance	Amber, slightly viscous liquid
Active ingredient	Zinc Naphthenate 60% (Zinc as metal, 8%)
Odor	Mild, mineral spirits odor
Viscosity Max. (25C.)	Gardner I, max.
Specific Gravity (25C.)	0.975-1.005
Lbs./Gallon (80F)	8.14-8.39
Flash Point	104F. Setafash

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUOCIDE 404-D

Fungicide for mildew control on paint film

EPA Registration No. 50534-115-1100

General Description

NUOCIDE 404-D is a broad-spectrum microbiocide for the control of fungi. This flowable form of NUOCIDE 960 provides excellent performance characteristics when used as mildewcide in aqueous paint systems only.

Typical Properties

Physical Form	Viscous, gray liquid
Active Ingredient:	
Tetrachloroisophthalonitrile	40.4%
Empirical Formula	C ₈ Cl ₄ N ₂
Molecular Weight	265.9
Freezing Point	-5C
Specific Gravity (Water=1)	1.24
Density	10.3 lb/gallon
Corrosivity to Metals	Noncorrosive

206 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUOCIDE 960

Fungicide for Manufacturing Use to Control Mildew on Paint Film

EPA Registration No. 50534-114-1100

General Description

NUOCIDE 960 is a broad-spectrum microbicide for the control of fungi. Its high degree of activity provides excellent performance characteristics for use as a mildewcide in:

1. Latex exterior and interior emulsion paints. For exterior paints, use 5-10 pounds per 100 gallons. For interior paints, use 2.5-5 pounds per 100 gallons.
2. Solvent-based paints at levels of 5-12 pounds per 100 gallons.

NUOCIDE 960 has several desirable properties which are important in manufacturing mildew-resistant paint:

1. Extremely low water solubility
2. Low vapor pressure
3. Fine particle size
4. Excellent pH stability

Typical Properties

Physical Form	3-5 micron micromilled gray powder
Active Ingredient:	96%
Tetrachloroisophthalonitrile	
Odor	Pure-odorless; Technical-slight pungent odor
Empirical Formula	C8Cl4N2
Molecular Weight	265.9
Melting Range	250-251C
Boiling Point	350C at 760 mm Hg
Specific Gravity (Water=1)	1.8
Bulking Factor, gal/lb	0.0667

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUODEX 84
Fungicide for adhesives, coatings and fiber materials

EPA Reg. No. 1100-12
EPA EST 1100-NJ-01

General Description

NUODEX 84 is a 50% aqueous solution of the sodium salt of 2-mercaptobenzothiazole designed for manufacturing use as a preservative for fibrous substrates (textiles, paper, etc.), adhesives, aqueous emulsions and other similar substrates. It imparts no color to the treated material. NUODEX 84 should not be used where resistance to leaching is important.

Physical and Chemical Properties

Appearance	Clear, amber liquid
Active Ingredient	Sodium 2-mercaptobenzothiazole 50%
Odor	Mild
Viscosity Max. (77F)	Gardner A (0.50 Poises)
Specific Gravity (77F)	1.235-1.265
Lbs./Gallon (77F)	10.3-10.5
Flash Point	>212F, PMCC

208 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUODEX 100 V.T. Microbiocide
EPA Reg. No. 1100-42

General Description

NUODEX 100 V.T. Microbiocide is a 40% active liquid non-metallic microbiocide formulated for use in synthetic polymeric films and coatings. NUODEX 100 V.T. Microbiocide effectively prevents fungal and bacterial deterioration and staining of (1) vinyl coated products such as upholstery, wall coverings, shades and umbrellas and (2) plasticized vinyl products such as shower curtains and drapes. NUODEX 100 V.T. Microbiocide is compatible with commercial resins, plasticizers and stabilizers. It is non-blooming.

Physical and Chemical Properties

Appearance	Light, clear to slight haze
Active Ingredient	Dodecyldimethylbenzylammonium salt of Naphthenic Acid, 40+-2%
Percent Solids	Maximum, 95%
Sodium Chloride	Maximum, 0.7%
Color	Maximum, Gardner 10
Viscosity (80F)	Maximum, Gardner X
Specific Gravity (80F)	1.005-1.030
Lbs/Gal (80F)	8.36-8.57
Flash Point (Tag Closed Cup)	105-115F

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUODEX Copper 8%
Fungicide for wood and fiber materials

EPA Reg. No. 1100-7

General Description

NUODEX Copper 8% is a copper naphthenate fungicide containing 8% copper as metal in an exempt mineral spirits base designed for manufacturing use in solvent applications to protect fibrous substrates (textiles, cordage, wood). It can be applied by pressure treatment, brushing, spraying, padding or dipping. It is easily formulated with water repellents for moisture resistance and at recommended use levels will not affect the hand of the treated fabric.

Physical and Chemical Properties

Appearance	Dark green, viscous liquid
Active Ingredient	Copper Naphthenate 80% (Copper as metal, 8%)
Odor	Mild, mineral spirits odor
Viscosity Max. (77F)	Gardner Z-3 (46.3 Poises)
Specific Gravity (80F)	0.990-1.060
Lbs./Gallon (80F)	8.2-8.8
Flash Point	126F, SCC

210 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUODEX PMA 18
Phenylmercuric Acetate

Preservative and fungicide for water-based (latex) paints intended for continuous outdoor use

EPA Reg. No. 1100-56

General Description

NUODEX PMA 18 is a solubilized form of phenylmercuric acetate containing 18% mercury as metal (30% phenylmercuric acetate) designed for manufacturing use only as an in-can preservative of water-based paints and coatings and as a fungicide in water-based paints for exterior application only.

Physical and Chemical Properties

Appearance	Light yellow liquid
Active Ingredient	Phenylmercuric acetate-30% (Mercury as metal - 18%)
Odor	Mild, ammonia-like
Viscosity Max. (77F)	Gardner A (0.50 Poises)
Specific Gravity (77/77F)	1.32
Lbs./Gallon (77F)	10.90
Flash Point	Above 232F, TCC

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUOPHENE
(Dihydroxy-Dichloro-Diphenyl-Methane)

EPA Reg. No. 1100-48

Description

Nuophene is a fungicide in the form of a fine powder, commonly referred to as Dichlorophene. In itself it meets Government Specification MIL-M-17222A(Mildew Resistant Compound). It can be applied either from a solvent or aqueous system.

Where to Use It:

- On textiles, such as cotton, duck, twill and webbing covered by such Government Specifications as MIL-T-3530 and MIL-R-16060.
- On cordage, such as manila, sisal, cotton and jute covered by such Government Specifications as MIL-M-3530 and MIL-R-16060.
- On hair felt covered by such Government Specifications as MIL-F-5030.
- In some 35 other Government Specifications calling for mildew resistant treatments.

212 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

NUOSEPT 65 Preservative
EPA Reg. No. 48301-8-1100

Preservative for latex paints and emulsions and to control bacteria in oilfield water systems

General Description

NUOSEPT 65 Preservative is an aqueous solution containing the following minimum concentrations of active ingredients:

4,4-dimethyloxazolidine	74.7% by wt.
3,4,4-trimethyloxazolidine	2.5% by wt.

It contains no metallic compounds nor any organic derivatives of sulfur, boron, phosphorus, or halogens.

The advantages of using NUOSEPT 65 Preservative are:

- Antimicrobial activity against a broad spectrum of microorganisms.
- Effective over a wide pH range including both alkaline and acid pH values.
- Alkaline buffering capability to prevent pH drift.
- Aids in maintaining optimum viscosity of emulsion formulations.
- Minimal discoloration of most formulations.
- Low freezing point.
- Excellent thermal stability.

In addition to its antimicrobial activity, the amine functionality in NUOSEPT 65 Preservative provides:

- Corrosion inhibition in many systems.
- Emulsifying capability when used with a fatty acid.

Physical and Chemical Properties

Neutral equivalent as a base	128-133.5
Color, APHA	100 (max.)
Flash point, Tag closed cup	120F
Freezing point	below -20C
Specific gravity at 25/25C	0.98-0.99
Viscosity at 25C	~7.5 cp
pH	10.5-11.5
Weight per U.S. gallon	8.2 lb.

NUODEX, INC.: Antimicrobials:

Product Name:

NUOSEPT 95 Preservative
EPA Reg. No. 1100-82

General Description

NUOSEPT 95 Preservative is a 50% aqueous solution of non-metallic organic compounds designed for use as a preservative in water-based products. NUOSEPT 95 Preservative effectively prevents deterioration and spoilage during the manufacture, storage and service of products such as latex paints, latex emulsions, pigment dispersions and slurries, inks, adhesives, caulks, sealants, metalworking fluids, paper coatings, drilling muds and flooding fluids. For example, the use of NUOSEPT 95 Preservative in latex paints will prevent bacterial decomposition of the paint during manufacture and storage without adversely affecting the physical properties, paint application characteristics or dry film performance. NUOSEPT 95 Preservative is non-yellowing and can be added at any point during paint manufacture.

Physical and Chemical Properties

Appearance	Clear, pale yellow liquid
Active Ingredients	5-Hydroxymethoxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane 24.5% 5-Hydroxymethyl-1-aza-3,7-dioxabicyclo(3.3.0)octane-17.7% 5-Hydroxypoly(methyleneoxy (74% C2, 21% C3, 4% C4, 1% C5) methyl-1-aza-3,7-dioxabicyclo (3.3.0)octane 7.8%
Odor	Mild, characteristic
Color (APHA)	250 max., clear
Viscosity (25C)	3.6 cSt
Specific Gravity (25/25C)	1.137
Lbs./Gal.	9.5
Refractive Index (25C)	1.404
pH	5-7
Flash Point (TCC)	>200F

214 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

PMA 60
Phenylmercuric Acetate

Preservative and fungicide for water-based (latex) paints

EPA Reg. No. 5383-8-1100
EPA Est. 5383-NJ-1

General Description

PMA 60 is a powdered form of phenylmercuric acetate containing 60% mercury (100% phenylmercuric acetate) designed for manufacturing use only in water-based paints and coatings as a preservative in the package and as a fungicide for exterior application. PMA 60 is packaged in polyethylene protected water soluble bags.

Physical and Chemical Properties

Appearance	Free flowing white powder
Active Ingredient	Phenylmercuric acetate - 100% (Mercury as metal 60%)
Odor	Mild
Lbs/Gallon	8.1
Melting Point	149C
Flash Point	>230F, TCC

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX

Fungicide for adhesives, coatings and fiber materials

EPA Reg. No. 1100-22

EPA EST 1100-NJ-01

General Description

QUINDEX is a solubilized form of 10% copper 8-quinolate (1.8% copper as metal) designed for manufacturing use in solvent applications to protect fibrous substrates (e.g., textiles, cordage, paper, etc.), and adhesives from fungal deterioration. It can be applied by pressure treatment, brushing, spraying, padding or dipping. It is easily formulated with water repellents for moisture resistance, and at recommended use levels will not affect the hand of the treated fabric.

Physical and Chemical Properties

Appearance	Dark green, thin liquid
Active Ingredient	Copper 8-quinolate 10% (Copper, as metal, 1.8%)
Odor	Mild, naphtha odor
Viscosity Max. (77F)	Gardner A-2 (0.220 poises)
Specific Gravity (77F)	0.970-0.990
Lbs./Gallon	8.10-8.25
Flash Point	104F, SCC

216 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX Emulsion Base:
Fungicide for textiles

EPA Reg. No. 1100-29

General Description

QUINDEX Emulsion Base is a emulsifiable form of 10% copper 8-quinolinolate (1.8% copper as metal) designed for manufacturing use in aqueous applications to protect textiles from fungal deterioration. QUINDEX Emulsion Base forms a stable emulsion by simple stirring in water until a smooth, creamy emulsion is obtained. At recommended use levels, it will not affect the hand of the fabric.

QUINDEX Emulsion base is not compatible with water repellents. In applications requiring water repellency use QUINDEX - a solubilized form of 10% copper 8-quinolinolate for solvent systems.

Physical and Chemical Properties

Appearance	Dark green, thin liquid
Active Ingredient	Copper 8-quinolinolate 10% (Copper, as metal, 1.8%)
Odor	Mild
Viscosity Max. (77F)	Gardner C (0.85 Poises)
Specific Gravity (77F)	0.965-0.985
Lbs./Gallon	8.05-8.20
Flash Point	126F, SCC

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX N-10 GDP Fungicide
Fungicide for wood

EPA Reg. No. 35977-20-1100

General Information:

QUINDEX N-10 GDP FUNGICIDE is a water dispersible concentrate of 10% copper 8-quinolinolate (1.8% copper as metal) designed for use in aqueous applications to protect wood from defacement by sapstain fungi.

QUINDEX N-10 GDP FUNGICIDE can be applied to wood by dip, brush or spray processes. The product is non-foaming, and can be used in direct contact with steel. Treatment solutions are easily prepared by the addition of water to the concentrate.

Physical and Chemical Properties:

Appearance	Light Green Liquid
Active Ingredient	10.0% Copper 8-quinolinolate (Copper, as metal, 1.80-1.83%)
Viscosity (77F)	550 cp
Specific Gravity (77F)	1.00-1.10
Pounds/Gallon	8.6
Boiling Point	212F
Flash Point	Not Applicable

218 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX N-10 PS Fungicide
Fungicide for fibrous materials

EPA Reg. No. 35977-18-1100

General Description:

QUINDEX N-10 PS FUNGICIDE is a water repellent formulation of solubilized 10% copper 8-quinolinolate (1.8% copper as metal) designed for use in solvent applications to protect fibrous substrates (e.g., wood, textiles, cordage, etc.) from fungal deterioration.

It can be applied by pressure treatment, brushing, spraying, dipping or padding. QUINDEX N-10 PS FUNGICIDE conforms to the American Wood Preserver's Association Specification, P-8.

Physical and Chemical Properties

Appearance	Dark brown-green waxy semi-solid
Active Ingredient	10%, copper 8-quinolinolate (Copper, as metal, 1.80-1.83%)
Viscosity (77F)	1,260 cp
Specific Gravity (77F)	0.95
Pounds/Gallon	7.5
Flash Point	104F Closed Cup

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX N-10 SS Fungicide
Fungicide for fibrous materials, adhesives and coatings

EPA Reg. No. 35977-19-1100

General Information:

QUINDEX N-10 SS Fungicide is a solubilized form of 10% copper 8-quinolinolate designed for use in solvent applications to protect fibrous substrate (e.g., wood, textiles, cordage, etc.) as well as coatings and adhesives from degradation and defacement by fungi. This product conforms to the American Wood Preserver's Association Specification P-8.

QUINDEX N-10 SS FUNGICIDE can be applied to fibrous materials by pressure treatment, brushing, spraying, dipping or padding. QUINDEX N-10 SS FUNGICIDE is easily formulated with water repellents for moisture resistance. It is an effective mildewcide for blending into adhesives and coatings.

Physical and Chemical Properties:

Appearance	Greenish yellow liquid
Active Ingredient	10.0%, Copper 8-quinolinolate (Copper, as metal, 1.80-1.83%)
Viscosity (77F)	17.5 cp
Specific Gravity (77F)	0.95
Density	7.5 pounds/gallon
Flash Point	105F Closed Cup

220 Fungicides, Biocides and Preservatives

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

QUINDEX N-10 WR Fungicide
Fungicide for wood

EPA Reg. No. 35977-1100

General Description:

QUINDEX N-10 WR FUNGICIDE is a water dispersible concentrate of 10% copper 8-quinolinolate designed for use in aqueous application to protect fibrous materials such as wood, paper and textiles from fungal degradation or defacement. QUINDEX N-10 WR FUNGICIDE is also an effective mildewcide for blending into adhesives and coatings. QUINDEX N-10 WR FUNGICIDE can be applied to wood or other substrates by dip, brush or spray processes. The product is non-foaming, and can be used in direct contact with steel. Treatment solutions are easily prepared by the addition of water to the concentrate.

QUINDEX N-10 WR FUNGICIDE can be incorporated in paper by addition to the pulp during manufacture or as a post treatment solution. Application to textiles is accomplished by spraying, padding, dipping or soaking.

Physical and Chemical Properties:

Appearance	Light Green Liquid
Active Ingredient	10.0%, Copper 8-quinolinolate (Copper, as metal, 1.80-1.83%)
Viscosity (77F)	550 cp
Specific Gravity (77F)	1.00-1.10
Pounds/Gallon	8.6
Boiling Point	212F
Flash Point	Not applicable

NUODEX, INC.: Antimicrobials(Continued):

Product Name:

SUPER AD-IT Fungicide
 Di(phenylmercuric)dodecenyyl succinate

Preservative and fungicide for water-based (latex) paints
 intended for continuous outdoor use

EPA Reg. No. 1100-37

General Description

SUPER AD-IT is a solvent solution of di(phenylmercuric) dodecenyyl succinate containing 10% mercury as metal [21% di-phenylmercuric)dodecenyyl succinate] designed for manufacturing use only as an in-can preservative of water-based paints and coatings and as a fungicide in water-based paints for exterior application only.

Physical and Chemical Properties

Appearance	Light yellow liquid
Active Ingredient	Di(phenylmercuric)dodecenyyl succinate 21% (Mercury as metal - 10%)
Odor	Slight acetic
Viscosity Max. (77F)	Gardner A-2 (0.22 Poises)
Specific Gravity (77/77F)	0.93
Lbs./Gallon (77F)	7.72
Flash Point	109F, SCC

222 *Fungicides, Biocides and Preservatives*

O'BRIEN INDUSTRIES, INC.: O'B ALGE 670:

DESCRIPTION

O'B Alge 670 is a complex polymeric quaternary ammonium microbiocide which is especially effective in controlling algae, iron bacteria and other slime forming microorganisms that contribute to the biological fouling of cooling towers, water storage tanks and heat exchangers. O'B Alge 670 can be used in alkaline or acid systems and does not foam.

SPECIFICATIONS

Appearance	Off White
Weight per gallon	8.49 lbs.
pH 1% solution	4.7

REGISTRATION

EPA Registration Number 11541-7

OLIN CHEMICALS: SODIUM OMADINE 40% Aqueous Solution Industrial Microbiostat for Industrial and Formulating Use Only:

Molecular Formula: C₅H₄NOSNa

Ingredients

Active - sodium pyrithione, min (%)	40
Inert, max (%)	60

Specifications

Sodium pyrithione (%)	40-42
Color, max (Gardner)	13
pH @ 25C	8.5-10

Typical Physical Properties

Molecular Weight(sodium pyrithione)	149.2
Color	amber
Form	liquid
Odor	mild
Weight per gallon (lbs)	10.2

General Properties

SODIUM OMADINE 40% Aqueous Solution

- exhibits pronounced growth inhibiting activity against a broad spectrum of Gram negative and Gram positive bacteria, molds and yeasts.
- is a chelating agent.
- should not be used in the presence of oxidizing agents.

EPA Registration

SODIUM OMADINE 40% solution is registered with the Environmental Protection Agency (EPA Registration No. 1258-843) for the uses listed below:

- Aqueous Metal Coolant and Cutting Fluid Solutions (Soluble Oil, Semisynthetic, Synthetic)
- Short term "In-Can" Preservation of Vinyl Acetate Latex Emulsion
- Aqueous based Jet-Printer Inks
- Aqueous Synthetic Fiber Lubricants (Spin Finishes)

Aqueous-based metalworking fluids of all types contain chemicals which, together with the water present, provide excellent nutrient sources for microorganisms. These organisms, if allowed to proliferate, can cause odors, deterioration of the fluid, and corrosion of machines and parts.

SODIUM OMADINE industrial microbiostat (40% solution) helps prevent such problems. Its active ingredient is sodium pyrithione (Chemical Abstracts Registry name and number: 2-pyridine-thiol-1-oxide, sodium salt, 3811-73-2). SODIUM OMADINE 40% solution is registered with the United States Environmental Protection Agency (EPA). The registration number is 1258-843.

The cost of cleaning a fluid system and refilling with fresh fluid is an expensive undertaking. Moreover, in today's regulatory climate, disposing of the used fluid can be very expensive. The regular use of a microbiostat (preservative) in metal-working fluid systems and a rigorous housekeeping program will usually lengthen fluid life and save on replacement, cleaning and disposal costs.

224 Fungicides, Biocides and Preservatives

OLIN CHEMICALS: ZINC OMADINE 48% Aqueous Dispersion, Industrial Grade:

Industrial Microbiostat for Industrial and Formulating Use Only.

Molecular Formula: C₁₀H₈N₂O₂S₂Zn

Ingredients

Active-zinc pyrithione(%)	48
(zinc 2-pyridinethiol 1-oxide)	
Inert (%)	52

Specifications

Zinc Pyrithione(%)	48-50
Zinc(%)	9.3-11.3
pH, 5% active slurry in pH7 H ₂ O	6.5-9.0

Typical Physical Properties

Molecular Weight(zinc pyrithione)	317.7
Color	Offwhite
Bulk Density (lbs/gal)	10

General Properties

ZINC OMADINE 48% Aqueous Dispersion

- exhibits pronounced growth inhibiting activity against a broad spectrum of both Gram positive and Gram negative bacteria
- inhibits the growth of fungi, both yeast and mold.

EPA Registration

ZINC OMADINE 48% Dispersion is registered with the Environmental Protection Agency for use in inhibiting bacterial growth in metalworking fluids and mold growth on laundered fabrics. (EPA Registration Number 1258-841).

OLIN CHEMICALS: ZINC OMADINE Powder Industrial Microbiostat
For Industrial and Formulating Use Only:

Molecular Formula: C₁₀H₈N₂O₂S₂Zn

Ingredients

Active - Zinc Pyrithione (%)	95
Inert (%)	5

Specifications

Zinc Pyrithione, min(%)	95
Volatiles, max(%)	1.0

Typical Physical Properties

Molecular Weight	317.7
Color	Tan
pH, 10% slurry in neutral distilled water	6.5-9.5
Bulk Density(g/ml)	~0.35
Specific Gravity @ 25C	1.782
Melting Point, Decomposes (C)	~240

General Properties

ZINC OMADINE Powder

- Exhibits pronounced growth inhibiting activity against a broad spectrum of both Gram negative and Gram positive bacteria.
- inhibits the growth of fungi, both yeast and mold.

EPA Registration

ZINC OMADINE powder is registered with the Environmental Protection Agency (EPA) for use in inhibiting the growth of bacteria in aqueous metal coolant and cutting fluid solutions and for inhibiting mildew and pink stain in PVC plastic. (EPA Registration No. 1258-840).

226 *Fungicides, Biocides and Preservatives*

OLIN CHEMICALS: TRIADINE 10 Antimicrobial Agent:

TRIADINE 10 exhibits pronounced growth inhibiting activity against a broad spectrum of Gram positive and Gram negative bacteria, yeasts and mold. TRIADINE 10 should not be used in the presence of any oxidizing agents.

Specifications

Active	
Sodium 2-pyridinethiol-1-oxide, min(%)	6.4
Hexahydro-1,3,5-tris(2-hydroxyethyl-s-triazine, min (%)	63.6
Inert, max (%)	30.0

Typical Physical Properties

Active Ingredients, min (%)	70.0
Density (lb/gal)	9.73
Specific Gravity @ 25C (g/ml)	1.17
Boiling Point (C)	110
Flash Point (C)	none
pH, 10% in neutral distilled water	10.0-10.5

EPA Registration

TRIADINE 10 is registered with the Environmental Protection Agency for use in inhibiting the growth of bacteria and fungi in aqueous-based metalworking fluids. (EPA Registration Number 1258-990).

PENNWALT CORPORATION: Fungicides:

Product Name:

MANEB

Technical

A Fungicide for Formulating Use

Active Ingredient:

Maneb (manganese ethylene-1,2-bisdithiocarbamate)	86%
(equivalent to manganese metallic 17.8%)	

Inert Ingredients:	14%
	100%

EPA Registration No. 4581-355

EPA Est. No. 33910-HL-01

PENNCOZEB

Fungicide

An 80% Coordination Product of Manganese and Zinc and Ethylene-bisdithiocarbamate

Active Ingredient:

A coordination product of zinc ion and manganese ethylene bisdithiocarbamate	80%
Manganese++	16%
Zinc++	2%
Ethylenebisdithiocarbamate ion (C4H6N2S4)	62%

Inert Ingredients:	20%
Total	100%

EPA Registration No. 4581-358

EPA Establishment No. 33910-HL-01

228 Fungicides, Biocides and Preservatives

PENNWALT CORPORATION: Fungicides(Continued):

Product Name:

For Distribution and Use Only in the State of Louisiana:

TOPSIN M 4.5F

Thiophanate-Methyl Fungicide
4.5 Pounds per Gallon Flowable

EPA Reg. No. 4581-352
EPA SLN No. LA-840013 (Rev. 1)

For Suppression of Aerial Blight (Rhizoctonia solani) on
Soybeans

For Distribution and Use Only in the State of Mississippi:

TOPSIN M 4.5F

Thiophanate-Methyl Fungicide
4.5 pounds per Gallon Flowable

EPA Reg. No. 4581-352
EPA SLN No. MS-840013

For Suppression of Aerial Blight (Rhizoctonia solani) on
soybeans

TOPSIN M
Thiophanate-Methyl Fungicide
70% Wettable Powder

Active Ingredient:

Thiophanate-methyl (dimethyl[(1,2-phenylene)-
bis(iminocarbonothioyl)]bis(carbamate))*

Inert Ingredients:	70%
	30%
Total:	100%

* Also known as dimethyl 4,4'-o-phenylenebis[3-thioallophanate]

EPA Registration No. 4581-322
EPA Establishment No. 39578-TX-1

For Distribution and Use Only Within the State of California:

TOPSIN M

Thiophanate-Methyl Fungicide
70% Wettable Powder

EPA Registration No. 4581-322-AA
EPA SLN No. CA-800005

PENNWALT CORPORATION: Fungicides(Continued):

Product Name:ZIRAM
Technical

Active Ingredient:

Ziram (Zinc dimethyldithiocarbamate) 98%

Inert Ingredients: 2.%

Total 100%

E.P.A. Registration No. 4581-261

E.P.A. Establishment No. 33910-HL-01

ZIRAM F-4

Fungicide

Active Ingredient:

Ziram (Zinc dimethyldithiocarbamate) 41.5%

(Zinc expressed as metallic....8.9%)

Inert Ingredients: 58.5%

Total 100.0%

EPA Registration No. 4581-230

EPA Establishment No. 4581-TX-1

For Distribution and Use Only Within the State of Oregon:

ZIRAM F-4

Flowable Fungicide

EPA Registration No. 4581-230

EPA SLN No. OR-840013

For Distribution and Use Only Within the State of Washington:

ZIRAM F-4

Flowable Fungicide

EPA Registration No. 4581-230

EPA SLN No. WA-830034

230 *Fungicides, Biocides and Preservatives*

RHONE-POULENC, INC.: Fungicides:

Product Name:

ALIETTE Fungicide

Active Ingredient:

Aluminum tris (O-ethyl phosphonate)	80.0%
Inert Ingredients:	20.0%

EPA Reg. No. 359-706

EPA Est. 0786

ROVRAL Fungicide

Active Ingredient:

Iprodione: 3-(3,5-dichlorophenyl)-N-(1-methylethyl) -2,4-dioxo-1-imidazolidinecarboxamide	50.0%
Inert Ingredients:	50.0%

EPA Reg. No. 359-685

EPA Est. 0986

ROHM AND HAAS: KATHON Preservatives(Continued):

Product Name:

KATHON LX
Polymer Latex Preservatives

KATHON LX
EPA Reg. No. 707-129

KATHON LX 1.5%
EPA Reg. No. 707-134

KATHON LX and KATHON LX 1.5% are antimicrobial products offered for use as preservative in latices containing acrylic, vinyl acetate-acrylic, polyvinyl acetate, styrene-butadiene, silicone, and other polymers. The active ingredients are effective at low concentrations against fungi and bacteria and are highly resistant to the inhibitory effects of most organic and inorganic compounds.

Physical and Chemical Properties:

KATHON LX:

Appearance: Amber to gold, slightly viscous liquid

Odor: Mild, aromatic

Specific Gravity: 1.25 (weight of active ingredients
1.17 lb./gal. minimum)

Density, lb/gal: 10.4

pH: 2 to 4

KATHON LX 1.5%:

Appearance: Pale yellow to green liquid

Odor: Mild, aromatic

Specific Gravity: 1.02

Density, lb./gal.: 8.4

pH: 3 to 5

Chemical Identification

The active ingredients are the compounds identified according to IUPAC nomenclature as 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one.

ROHM AND HAAS: KATHON Preservatives (Continued):

Product Name:

KATHON MWX
Microbiocide Packets
EPA Reg. No. 707-171

KATHON MWX microbiocide packet is an innovative and highly efficient product which supplies KATHON 886MW liquid microbiocide in a convenient and safe-to-handle water-permeable plastic packet.

Some important advantages of KATHON MWX are:

- Extends fluid life
- Eliminates odor produced by bacteria
- Controls bacteria and fungi, yeasts and molds
- Safely handled and easily dispensed
- Minimizes machine downtime
- Effective over a wide pH range
- Nonhazardous at use dilutions
- Does not contain or release formaldehyde
- EPA registered for metalworking fluids

Chemical Identification

The active ingredients in the KATHON MWX packet are the compounds identified by the IUPAC nomenclature as 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one.

ROHM AND HAAS: KATHON Preservatives(Continued):

Product Name:

KATHON WT Cooling Tower, Air Washer and Papermill Slimicide

KATHON WT

EPA Reg. No. 707-128

KATHON WT 1.5%

EPA Reg. No. 707-133

Microbiocides and slimicides for industrial cooling tower water, air washers and papermill process water.

These high-performance broad-spectrum isothiazolone microbiocides are effective at very low concentration (as low as 1 ppm active ingredient) in controlling the growth of algae, bacteria and fungi in industrial water cooling towers, air washers and papermill waters. Isothiazolone biocides are also used safely for a wide variety of registered applications unrelated to water treatment.

Performance Advantages

KATHON WT and WT 1.5% microbiocides offer a number of outstanding advantages:

- Broad Spectrum of Activity
- Effective at Low Concentrations
- Effective at Wide pH Range
- Water Soluble
- Nonionic
- Non-surface Active
- Persistence
- Ease of Decontamination
- Low Toxicity

Chemical Identification

The active ingredient of KATHON WT and KATHON WT 1.5% microbiocides is a mixture of two isothiazolinones identified by the IUPAC system of nomenclature as:

- 5-chloro-2-methyl-4-isothiazolin-3-one
- 2-methyl-4-isothiazolin-3-one

234 Fungicides, Biocides and Preservatives

ROHM AND HAAS: KATHON Preservatives (Continued):

Product Name:

KATHON 886 MW
EPA Reg. No. 707-129

KATHON 886 MW 1.5%
EPA Reg. No. 770-134

Metalworking Fluid Microbiocides

KATHON 886 MW and KATHON 886 MW 1.5% microbiocides are offered for use as preservatives in aqueous metalworking fluids. In this application, they offer the following advantages and benefits:

- Broad-spectrum activity; controls bacteria, fungi, molds, yeasts
- Ten times more effective than competitive biocides; one gallon of KATHON 886 MW preserves 8,000-10,000 gallons of metalworking fluid for about three weeks.
- Direct addition to the holding tank by automatic metering or as a "shock" treatment
- Nonhazardous at use dilutions
- Compatible with most components of metalworking fluids; is not deactivated by organic matter; does not produce foam
- Chemically stable as supplied at least 6 months at 50C; indefinitely stable at ambient temperatures
- Effective over a wide range of pH
- EPA-registered for use in metalworking fluids

Physical and Chemical Properties

KATHON 886 MW
Appearance: Amber to gold slightly viscous liquid
Odor: Mild, aromatic
Density, lb/gal: 10.4

KATHON 886 MW 1.5%
Appearance: Pale yellow to green liquid
Odor: Mild, aromatic
Density, lb/gal: 8.4

Chemical Identification

The active ingredients are the compounds identified according to Chemical Abstracts nomenclature as 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one.

THE O.M. SCOTT & SONS CO.: SCOTTS PROTURF:

Product Name:

14-3-3

FF II

- prevents and controls turfgrass diseases
- provides controlled release nitrogen feeding

Active Ingredient		
Pentachloronitrobenzene		15.40%
Inert Ingredients		84.60%
	Total	100.00%

EPA Reg. No. 538-106

EPA Est. 538-OH-1

23-3-3

Fertilizer Plus Fungicide VIII

- broad spectrum fungicide
- controlled release nitrogen

Active Ingredients

Thiophanate-Methyl [Dimethyl (1,2-phenylene) bis (iminocar- bonothioyl) bis (carbamate)		1.75%
Iprodione. (3-(3,5-Dichlorophenyl)-N-(1-methylethyl)- 2,4-dioxo-1-imidazolidinecarboxamide		0.87%

Inert Ingredients		97.36%
	Total	100.00%

EPA Reg. No. 538-194

EPA Est. 538-OH-1

24-5-3

Fertilizer plus Fungicide

- for use on winter turf diseases
- prevents and controls pink and gray snow mold
- provides controlled release nitrogen feeding

Active Ingredients

Phenylmercuric acetate		0.80%
Thiram(Tetramethylthiuram disulfide)		5.60%

Inert Ingredients		93.60%
	Total	100.00%

EPA Reg. No. 538-36

EPA Est 538-OH-1

236 Fungicides, Biocides and Preservatives

THE O.M. SCOTT & SONS CO.: SCOTTS PROTURF (Continued):

Product Name:

28-0-12

Fertilizer Plus Fungicide 7

- provides systemic prevention and control of turfgrass diseases including benzimidazole tolerant dollar spot
- provides controlled release nitrogen feeding

Active Ingredient

1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-
2-butanone 0.62%

Inert Ingredients 99.38%

Total

100.00%

EPA Reg. No. 538-174

EPA Est. 538-OH-1

Broad Spectrum Fungicide

- for use on winter turf diseases
- prevents and controls pink and gray snow mold

Active Ingredients

PMA (Phenylmercuric acetate) 0.69%

Thiram (Tetramethylthiuram disulfide) 4.65%

Inert Ingredients 94.66%

Total

100.00%

EPA Reg. No. 538-27

EPA Est. 538-OH-1

Fluid Fungicide

- Prevents and controls turf diseases on tees, greens, fairways and similar turf areas

Active Ingredients:

Thiophanate-methyl, Dimethyl (1,2-phenylene) bis
{iminocarbonothioyl} bis [carbamate] 19.65%

Iprodione 3-(3,5-Dichlorophenyl)-N-(1-methyl-
ethyl)-2,4-dioxo-1-imidazolidinecarboxamide 19.65%

Inert Ingredients: 60.70%

Total

100.00%

EPA Reg. No. 538-183

EPA Est. No. 37429-GA-1

THE O.M. SCOTT & SONS CO.: SCOTTS PROTURF(Continued):

Product Name:

Fluid Fungicide II

- prevents and controls turfgrass diseases

Active Ingredients:

Triadimefon, 1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone 16.00%

Metalaxyl, N-(2,6-Dimethylphenyl)-N-(methoxyacetyl) alanine, methyl ester 16.00%

Inert Ingredients 68.00%

Total: 100.00%

EPA Reg. No. 538-203
EPA Est. No. 37429-GA-01

Fungicide II

- prevents and controls Pythium blight and gray snow mold

Active Ingredient:

Chloroneb (1,4-dichloro-2,5-dimethoxybenzene) 6.25%

Inert Ingredients: 93.75%

Total 100.00%

EPA Reg. No. 538-103
EPA Est. 538-OH-1

Fungicide VI

- prevents and controls turfgrass diseases including benzimidazole tolerant dollar spot

Active Ingredient

3-(3,5-dichlorophenyl)-N-(methylethyl)-2,4-dioxo-1-imidazolidinecarboxamide 1.30%

Inert Ingredients 98.70%

Total 100.00%

EPA Reg. No. 538-159
EPA Est 538-OH-1

238 Fungicides, Biocides and Preservatives

THE O.M. SCOTT & SONS CO.: SCOTTS PROTURF(Continued):

Product Name:

Fungicide 7

- systemic fungicide that prevents and controls dollar spot (including benzimidazole tolerant strains), brown patch, anthracnose and rust

Active Ingredient:

(1-(Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone .59%

Inert Ingredients: 99.41%

Total 100.00%

EPA Reg. No. 538-161

EPA Est. 538-OH-1

Pythium Control

Active Ingredient:

Metalaxyl N-(2,6-Dimethylphenyl)-N-methoxyacetyl) alanine, methyl ester 1.21%

Inert Ingredients: 98.79%

Total 100.00%

EPA Reg. No. 538-185

EPA Est. 538-OH-1

Systemic Fungicide

- provides systemic disease prevention and control

Active Ingredient:

Dimethyl 4,4-o-phenylenebis (3-thioallophanate) 2.30%

Inert Ingredients: 97.70%

Total 100.00%

EPA Reg. No. 538-88

EPA Est 538-OH-1

STANDARD TAR PRODUCTS CO., INC.: ORGANICLEAR Wood Preservatives:

The Safe Alternative for Wood Protection

- For Below and Above Ground Use
- For Surfaces in Contact with Water
- Protects against Mold, Mildew & Fungus
- Prevents Wood Rot and Decay
- Leaves Paintable Surface
- Repels Termites

Product Name:

ORGANICLEAR TM-2

Clear wood preservative

Economical for use against wood deterioration

ORGANICLEAR WR-2

Clear grain water repellent wood preservative

Contains sealants and penetrating oils to enhance natural wood grain beauty. Guards against swelling, cracking and warping.

ORGANICLEAR WR-2

Water repellent wood preservative stain

Seals out moisture. Prevents wood rot and fungus attack. Stains a permanent color. Available in Redwood, Forest Green, Walnut Brown.

ORGANICLEAR TM-5

Clear wood preservative

Below and above ground economical preservative for use against termite, wood rot and fungus attack.

ORGANICLEAR WR-5

Below ground water repellent wood preservative

Mineral oils and sealants retard moisture penetration. Guards against termite, wood rot and fungus attack.

ORGANICLEAR

Wood & deck sealer

Waterproofs treated or untreated wood while penetrating oils bring out the natural wood grain finish. Prevents swelling, cracking and warping.

ORGANICLEAR 2: EPA Reg. No. 458-32

ORGANICLEAR 5: EPA Reg. No. 458-33

240 Fungicides, Biocides and Preservatives

STAUFFER CHEMICAL COMPANY: FOLPET (PHALTAN) 50-WP:

Agricultural Fungicide for Plant Disease Control
Wettable Powder for use in Water

Active Ingredient:

FOLPET: N-(trichloromethylthio)phthalimide 50.0%

Inert Ingredients: 50.0%
100.0%

Contains 50 pounds of active ingredient per 100 pounds.

PHALTAN is a registered trademark for phthalimide fungicide

EPA Reg. No. 476-1609

TENNESSEE CHEMICAL COMPANY: Tenn-Cop 5E:

General:

An easy to use emulsifiable liquid organic based copper fungicide for effective control of many diseases caused both by bacteria and fungi on horticultural, field, and ornamental crops. The active ingredient is the copper salts of fatty and rosin acids, which is neutral in pH, is not corrosive or abrasive to spray equipment, and the copper salt of the rosin acids provides the product ability to stick to the plant foliage. It is effective and labelled for application through well maintained overhead irrigation sprinklers.

Typicals:

Emulsifiable concentrate, containing 58% of the active ingredient, which contains 5.14% copper expressed as metallic or 0.42 lbs of copper per gallon.

Specific Gravity	1.006 @ 70F
Flash Point (P-M closed cup)	108F
Viscosity @ 72F, centipoises	435
Shelf-life of Formulation	Over two years

Usages:

Broad spectrum fungicide-bactericide. EPA registered for use on beans (dry and green), tomatoes, peppers, peanuts, and many other crops on the label.

For broad spectrum disease control TENN-COP 5E is usually mixed with another organic fungicide such as BRAVO, DIFOLATAN, or a maneb type as well as an insecticide.

Advantages of TENN-COP 5E:

1. Non-corrosive to spray equipment. Easy to use.
2. Compatible with DIFOLATAN, BRAVO, and maneb type fungicides and newer insecticides.
3. Contains rosin acids which stick material to plants.
4. Several crop uses are labelled for application by overhead sprinkler irrigation equipment.
5. Only 0.16 pounds of copper are applied per acre per application.

EPA Reg. No. 1109-37

242 *Fungicides, Biocides and Preservatives*

TENNESSEE CHEMICAL COMPANY: Tri-Basic Copper Sulfate:

Chemical Analysis

Cu	53.0%
HCl Insoluble	0.74%
Total S	7.65%
Soluble S	0.36%
Pb	Nil
Loss on Drying at 110C	4.7%

Tennessee Brand Tri-Basic Copper Sulfate New Improved

Active Ingredient:

Copper [In Basic Copper Sulfate] 53%

Inert Ingredient: 47%

E.P.A. Reg. No. 1109-13

E.P.A. Est. No. 1109-TN-1

TROY CHEMICAL CORP.: TROYSAN AMO (Troysan Anti-Mildew O):

E.P.A. Registration No. 5383-54
Non-metallic, Low Cost, Powder Fungicide

DESCRIPTION

TROYSAN AMO is a non-metallic organic fungicide which is designed for use in non-aqueous coatings. It is supplied as a white dispersible powder.

TROYSAN AMO is a broad spectrum fungicide.

USE

TROYSAN AMO is used in non-aqueous systems.

ADVANTAGES

- broad spectrum efficacy
- suitable for both interior and exterior formulations
- does not affect color
- lowest cost non-aqueous fungicide
- 20 years of proven performance

TYPICAL PROPERTIES

Active Ingredient:

N-(trichloromethylthio) phthalimide

88%

Physical Form:

off-white powder

Specific Gravity (25/26C):

1.75

Bulk Density:

14.6

Melting Point:

329-338F

244 Fungicides, Biocides and Preservatives

TROY CHEMICAL CORP.: TROYSAN CMP (TROYSAN CMP ACETATE):

E.P.A. Registration No. 5383-10
Lowest Cost Organo-Metallic Biocide

DESCRIPTION

TROYSAN CMP is an organo-metallic water soluble liquid. It is especially useful in aqueous systems where viscosity drift from spoilage is a problem.

USE

TROYSAN CMP is the most cost effective mercurial in-can preservative. Recommended use levels are between 0.025%-0.5% based on the total weight of the formulation.

TROYSAN CMP has demonstrated efficacy against a broad range of fungal organisms. However, because of its water solubility, it is not recommended for use in exterior formulations without test fence exposure. TROYSAN CMP may be used in water-based formulations only.

Advantages

- water soluble liquid
- most cost effective mercurial biocide
- long lasting protection
- 20 years of successful field experience
- lends viscosity stability to contaminated systems

TYPICAL PROPERTIES

Active Ingredient:	Chlormethoxypropyl mercuric acetate	20%
Mercury Metal Content:		10% Min.
Appearance:		Clear, mobile liquid
Color (Gardner):		3 Max.
pH:		10.0+-0.5
Specific Gravity:		
Density(27C):		1.120-1.146
Lbs/Gallons:		9.34-9.55
Solubility:		Miscible with water

TROY CHEMICAL CORP.: TROYSAN PMA-10-SEP:

E.P.A. Registration No. 5383-9
Organo-Metallic Powder Designed for Powder Formulations

DESCRIPTION

TROYSAN PMA-10-SEP is an organo-metallic powdered biocide designed for use in powdered formulations.

USE

TROYSAN PMA-10-SEP is used for in-can preservation and for mildew resistance protection in water-based formulations.

TYPICAL PROPERTIES

Active Ingredient:

Phenyl Mercury Acetate

10% Min.

Mercury metal content:

5.45%

Appearance:

Fine off-white powder

Dry Bulk Density:

22 lbs./cu. ft.

Particle Size:

Not more than 2% retained
on 325 mesh screen

246 *Fungicides, Biocides and Preservatives*

TROY CHEMICAL CORP.: TROYSAN PMA-30:

E.P.A. Registration No. 5383-4
Organo Metallic Liquid Biocide

DESCRIPTION

TROYSAN PMA-30 is an organo-metallic water soluble liquid biocide.

USE

TROYSAN PMA-30 can be used as an in-can preservative as well as a mildewcide for exterior formulations.

ADVANTAGES

- water soluble liquid
- broad spectrum efficacy
- over 20 years successful field experience
- provides both in-can preservation, and mildew resistance

TYPICAL PROPERTIES

Active Ingredient:	Phenylmercury Acetate	Minimum 30%
Mercury Metal Content:		18.0% Min.
Specific Gravity:		1.275-1.320
Lbs./Gallon:		10.64-11.00
Maximum Color (Gardner):		4
pH:		7.5-8.0
Solubility:		Completely soluble in water

TROY CHEMICAL CORP.: TROYSAN PMDS-10:

E.P.A. Registration No. 5383-62

Organo-metallic Liquid Biocide for Aqueous and Oil-modified
Latex Formulations

DESCRIPTION

TROYSAN PMDS-10 is an organo-metallic liquid biocide. It has broad spectrum efficacy for both in-can preservation and mildew resistance applications.

USE

TROYSAN PMDS-10 may be used in a variety of aqueous and oil modified latex formulations. It is an excellent all-purpose preservative that is effective in a variety of systems.

ADVANTAGES

- less pigment shock in comparison to other phenylmercury compounds
- long lasting
- broad spectrum activity
- twenty years of proven performance

TYPICAL PROPERTIES

Active Ingredients:

Di(phenylmercury) didenyl succinate	21%
Mercury Metal Content, minimum:	10.0%
Specific Gravity:	0.925-0.947
Lbs./Gallon:	7.7-7.9
Color (Gardner):	5 max.
Viscosity (Gardner):	A-2
Non-volatile:	23% Max.
Solubility:	Dissolves in hydrocarbon solvents

248 Fungicides, Biocides and Preservatives

TROY CHEMICAL CORP.: TROYSAN POLYPHASE AF1:

EPA Registration No. 5383-63

PRODUCT:

TROYSAN POLYPHASE AF1 is a broad spectrum, liquid, non-metallic fungicide which is effective against a wide variety of fungal organisms. It may be used to protect both interior or exterior coatings from the growth of fungal organisms on the film surface. It may also be used as a fungicide in cutting oils, textiles, paper coatings, inks, plastics, adhesives, and canvas and cordage. It is also recommended as a wood preservative.

USES:

- Paints and Stains
- Plastics
- Cutting Oils
- Wood
 - Sapstain Control
 - Millwork
- Textiles
- Paper Coatings
- Canvas and Cordage
- Inks
- Adhesives

TYPICAL PROPERTIES

Active Ingredient	40% min. 3-iodo-2-propynyl butyl carbamate
Appearance	Amber mobile liquid
Color (Gardner)	9 maximum
Viscosity (Gardner Bubble) 25C	C maximum
Specific Gravity 25C	1.1-1.2
Lbs./Gal.	9.1-10.0
Odor	Characteristic

TROY CHEMICAL CORP.: TROYSAN POLYPHASE P100:

EPA Registration No. 5383-50

PRODUCT:

TROYSAN POLYPHASE P100 is a broad spectrum, solid, non-metallic fungicide which is effective against a wide variety of fungal organisms. It may be used to protect both interior or exterior coatings from the growth of fungal organisms on the film surface, as a fungicide in cutting oils, textiles, paper coatings, inks, plastics, adhesives, and canvas and cordage. It is also used as a wood preservative.

USES:

- Paints and Stains
- Plastics
- Cutting Oils
- Wood
 - Sapstain Control
 - Millwork
- Textiles
- Paper Coatings
- Inks
- Adhesives

TYPICAL PROPERTIES

Active Ingredient	97% min. 3-iodo-2-propynyl butyl carbamate
Appearance	Off white granular powder
Melting Point	64-66C
Density	1.57-1.58

250 *Fungicides, Biocides and Preservatives*

TROY CHEMICAL CORP.: TROYSAN 142:

E.P.A. Registration No. 5383-7

Non-metallic organic powdered biocide

DESCRIPTION

TROYSAN 142 is a non-metallic organic powder. It has a broad spectrum efficacy in a variety of aqueous systems.

USE

TROYSAN 142 is used in a variety of aqueous systems, including adhesives, pigment dispersions, resin emulsions, powder joint cements, and protein colloids.

Further TROYSAN 142 has the following F.D.A. clearances:

"Title 21" Slimicides, Paragraph 176.300, Adhesives, Paragraph 175.105, and Paper, Paperboard, Foodboard, Coatings, Paragraph 176.170.

ADVANTAGES

- highly effective biocide
- broad spectrum (bactericide/fungicide) activity
- long lasting
- 15 years of successful field experience
- cost effective protection
- F.D.A. Clearances

TYPICAL PROPERTIES

Active Ingredient:

3,5-dimethyltetrahydro 1,3,5,2H-Thiadiazine-2-Thione 95%

Specific Gravity:

1.39

Melting Point:

99.5C

TROY CHEMICAL CORP.: TROYSAN 174:

E.P.A. Registration No. 5383-11
 Non-metallic, Low Cost, Water-soluble Biocide

DESCRIPTION

TROYSAN 174 is a non-metallic, organic biocide designed for use in systems which are subject to bacterial deterioration. Examples of such systems are: latex paints, resin emulsions, adhesives, pigment dispersions, joint cements, cutting oils, drilling additives and any other system where water is a primary component. It is supplied as a clear amber water-soluble liquid. TROYSAN 174 is a broad spectrum biocide.

USE

TROYSAN 174 is used in all systems where water is a primary component.

ADVANTAGES

- lowest cost biocide
- broad spectrum biocide
- ease of incorporation
- excellent freeze-thaw stability as well as a low freezing point
- one of the first non-metallic biocides
- over 10 years of successful field performance
- long lasting efficacy

TYPICAL PROPERTIES

Active Ingredient:	2[(Hydroxymethyl) amino] ethanol	100%
Physical Form:		Clear amber liquid
Specific Gravity:		1.14-1.16
Lbs./Gal.		9.5-9.6
pH:		11.0+-0.5
Viscosity (Gardner):		L Max.
Color (Gardner):		7 Max.
Solubility:		Completely soluble in water

252 Fungicides, Biocides and Preservatives

TROY CHEMICAL CORP.: TROYSAN 192:

E.P.A. Registration No. 5383-17
Non-metallic, Low Cost, Water-Soluble Biocide

DESCRIPTION

TROYSAN 192 is a non-metallic, organic biocide designed for use in systems which are subject to bacterial deterioration. Examples of such systems are: latex paints, resin emulsions, adhesives, pigment dispersions, joint cements, cutting oils, drilling additives and any other system where water is a primary component. It is supplied as a clear water soluble liquid.

TROYSAN 192 is a broad spectrum biocide.

USE

TROYSAN 192 is used in all systems where water is a primary component.

ADVANTAGES

- cost effective biocide
- broad spectrum biocide
- ease of incorporation
- excellent freeze-thaw stability as well as low freezing point
- one of the first non-metallic biocides
- over 10 years of successful field performance
- long lasting efficacy

TYPICAL PROPERTIES

Active Ingredient:	2[(hydroxymethyl) amino]-2-methyl-propanol	100%
Physical Form:		Clear amber liquid
Specific Gravity:		0.96-0.99
Lbs/Gallon:		8.0-8.5
pH:		11.2±0.5
Viscosity (Gardner):		A3-A5
Color (Gardner):		3 Max.

UNION CARBIDE CORP.: AQUICAR Water Treatment Microbiocides:

Product Name:

AQUICAR 515
 AQUICAR 545

AQUICAR Water Treatment Microbiocides, available as AQUICAR 515, a 15 per cent aqueous solution of glutaraldehyde, and AQUICAR 545, a 45 per cent aqueous solution of glutaraldehyde, are especially effective in controlling slime forming bacteria, sulfate reducing bacteria, and algae in recirculating water cooling towers and systems. AQUICAR Water Treatment Microbiocides, which kill microorganisms by reacting with the cell wall, have many important features including:

- EPA Registration
- Effectiveness against a broad spectrum of microorganisms
- Functionality over a broad pH and temperature range
- Aqueous solution which is easily and uniformly diluted and mixed
- Non surface active; compatible with phosphate, phosphonate and chromate based corrosion systems
- Effectiveness against aerobic and anaerobic organisms
- Ability to clean biologically fouled systems
- Ability to be transported and store in bulk containers

EPA Status

AQUICAR 545
 AQUICAR 515

EPA Registration No. 10352-22
 EPA Registration No. 10352-23

Specifications

AQUICAR 515 Microbiocide

Specific Gravity at 20/20C	1.030 to 1.044
Glutaraldehyde (minimum)	15% by wt.
pH at 25C	3.7 to 4.5
Color	100 platinum-cobalt, maximum

AQUICAR 545 Microbiocide

Specific Gravity at 20/20C	1.110 to 1.123
Glutaraldehyde (minimum)	45% by wt.
pH at 25C	3.7 to 4.5
Color	100 platinum-cobalt, maximum

254 Fungicides, Biocides and Preservatives

UNION CARBIDE CORP.: UCARCIDE Antimicrobials:

UCARCIDE Antimicrobials for Preservative Applications

Introduction

A major concern in the preparation of cosmetic, toiletry, or chemical specialty products is adequate preservation against microbiological contamination. Such contamination can arise from many possible sources, such as:

- Raw materials, including water.
- Containers and their closures.
- Manufacturing equipment and the plant environment.
- The user and the environment during normal consumer life of the product.

UCARCIDE Antimicrobials can reduce these concerns. Based on the powerful and unparalleled antimicrobial action of glutaraldehyde, these high performance products provide excellent control over a wide variety of microorganisms.

UCARCIDE Antimicrobials are extremely effective as preservatives at very dilute concentrations. Efficacy tests reveal that they are more effective than most other preservatives currently used in the cosmetic industry.

EPA Status

UCARCIDE 225 and 250 Antimicrobials have been registered with United States Environmental Agency as a preservative.

UCARCIDE 225 Antimicrobial	EPA Registration No. 10352-20
UCARCIDE 250 Antimicrobial	EPA Registration No. 10352-21

CFTA Status

The active ingredient of UCARCIDE 225 AND 250 Antimicrobials is listed in the Cosmetic Ingredient Dictionary.

Typical Physical Properties

UCARCIDE 225 Antimicrobial:

Specific Gravity at 20/20C	1.066
Boiling Point, 760 mm. Hg	100.5C
Vapor Pressure at 20C.	16.4 mm. Hg.
Freezing Point	-10C (approx.)
Absolute Viscosity at 0C.	8.0 cps
Surface Tension at 20C.	45 dynes/cm.
Refractive Index, n _D 20C	1.375

UCARCIDE 250 Antimicrobial:

Specific Gravity at 20/20C.	1.131
Boiling Point, 760 mm. Hg	101.2C
Vapor Pressure at 20C.	15.0 mm. Hg.
Freezing Point	-21C (approx.)
Absolute Viscosity at 0C.	90.0 cps
Surface Tension at 20C.	48 dynes/cm

UNION CARBIDE CORP.: UCARCIDE Antimicrobials(Continued):

Product Name:

UCARCIDE 150 Antimicrobial

UCARCIDE 150 Antimicrobial is effective in protecting against many types of microorganisms encountered in oil field operations, including sulfate-reducing bacteria and bacterial and algal slime formers. It has been registered with the United States Environmental Protection Agency.

Description

The ease of handling and high potency of UCARCIDE Antimicrobial 150 facilitates its use for promoting and maintaining a bacterially-controlled environment in the following oil field applications:

- Water Flood Injection Water
- Drilling, Completion, and Workover (DCW) Fluids
- Fracturing Fluids
- Packer Fluids
- Treatment of Produced Water Prior to Re-injection or Storage

Special Features

- Broad spectrum biocide effective against both aerobic and anaerobic microorganisms.
- EPA registration.
- Highly concentrated.
- Effective over a broad pH and temperature range.
- Water soluble. Therefore, easy to mix and dilute uniformly.
- Low vapor pressure.
- Not affected by hard water or salts.
- Compatible with nonionic, anionic, and cationic surfactants.
- Easy to deactivate.
- Non surface active.
- Ability to clean biologically-fouled systems.

EPA Reg. No. 10352-24

UNION CARBIDE CORP.: UCARCIDE Antimicrobials(Continued):

Product Name:

UCARCIDE Antimicrobial 750 for Pigment and Filler Slurries:

Introduction

UCARCIDE Antimicrobial 750, an EPA-registered material, contains Glutaral USP, a 50-percent aqueous solution of glutaraldehyde. It is especially effective in controlling bacterial growth in aqueous pigment and filler slurries.

Special Features

- Effective against a broad spectrum of microorganisms
- Functional over a broad pH and temperature range
- No effect on slurry viscosity
- Non-surface active and non-foaming
- Effective against aerobic and anaerobic organisms
- Does not contain or release formaldehyde
- Lower vapor pressure than formaldehyde
- Not affected by the presence of hard water
- Non-corrosive to metals at recommended use levels
- Aqueous solution which is easily and uniformly diluted and mixed
- Easily neutralized for disposal
- Compatible with anionic, nonionic, and cationic dispersants
- Complies with FDA Regulations 176.170 and 176.180 covering use in pigment and filler slurries used in the manufacture of paper and paperboard for food packaging
- Meets the specifications of the USP monograph for glutaral

EPA Reg. No. 10352-35

UNION CARBIDE CORP.: UCONEX Antimicrobial 345 for Metalworking Fluids:

Description

UCONEX Antimicrobial 345, a 45 percent aqueous solution of glutaraldehyde, is an EPA-registered, high-performance microbiocide especially effective in controlling bacteria and fungi in aqueous metalworking fluids. It kills microorganisms by chemically reacting with their cell walls.

Special Features

- Effective against a broad spectrum of microorganisms, including bacteria, molds, and yeasts
- Functional over a broad pH and temperature range
- Effective at low concentrations
- Non-surface active and non-foaming
- Effective against aerobic and anaerobic organisms
- Does not contain or release formaldehyde
- Not affected by the presence of hard water
- Non-corrosive to metals at recommended use levels
- Low in toxicity and easy to handle relative to other microbiocides
- Biodegradable

EPA Status

UCONEX Antimicrobial 345

EPA Registration No. 10352-28

Specifications

Specific Gravity at 20/20C

1.100 to 1.123

Glutaraldehyde (minimum)

45% by wt

pH at 25C

3.1 to 4.5

Color

100 platinum-cobalt, maximum

258 Fungicides, Biocides and Preservatives

UNIROYAL CHEMICAL CO., INC.: FUNGICIDES:

Product Name:

PLANTVAX-75W

Systemic Fungicide for Rust Control of Geraniums in Greenhouses

COMPOSITION

Active Ingredient: (% by weight)	
oxycarboxin(5,6-dihydro 2-methyl-1,4 oxathiin -3-carboxanilide-4,4-dioxide)*	75.0%
Inert Ingredients:	25.0%
TOTAL:	100.0%

* U.S. Patent 3,454,391

EPA Reg. No. 400-144-AA

EPA Est. No.

TERRACLOR 2 LB. Emulsifiable Soil Fungicide

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	23.8%
Inert Ingredients:	76.2%
Total:	100.0%

Contains 2 lbs. of Pentachloronitrobenzene per U.S.
Gallon at 68F.

EPA Reg. No. 400-400

EPA Est. No.

TERRACLOR 10% Granular Soil Fungicide

Controls certain Soil-Borne Diseases of Cotton, Beans, Crucif-
ifiers, Peanuts and Potatoes

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	10%
Inert Ingredients:	90%
Total:	100%

EPA Reg. No. 400-402

EPA Est. No.

UNIROYAL CHEMICAL CO., INC.: Fungicides (Continued):

Product Name:

TERRACLOR 75% Wettable Powder Soil Fungicide:

Controls Certain Soil-Borne Diseases of Cotton, Crucifers, Peanuts, Peppers, Beans, Potatoes, Garlic, Ornamentals and Turf

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	75%
Inert Ingredients:	25%
Total:	100%

EPA Reg. No. 400-399

EPA Est. No.

TURFCIDE 10% Granular Turf & Ornamental Fungicide:

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	10.0%
Inert Ingredients:	90.0%
Total:	100.0%

EPA Reg. No. 400-407

EPA Est. No.

TURFCIDE 2 Lb. Emulsifiable Turf & Ornamental Fungicide:

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	24%
Inert Ingredients:	76%
Total:	100%
Contains 2 lbs. of Pentachloronitrobenzene per U.S. Gallon at 68F.	

EPA Reg. No. 400-404

EPA Est. No.

260 Fungicides, Biocides and Preservatives

UNIROYAL CHEMICAL CO., INC.: Fungicides (Continued):

Product Name:

TERRACLOR SUPER X Granular Soil Fungicide with THIMET Systemic Insecticide

Not for use or storage in or around the home.

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	6.50%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	1.63%
Phorate [O,O-Diethyl S-(ethylthio) methyl phosphorodithioate]	6.50%
Inert Ingredients:	85.37%
Total:	100.00%

EPA Reg. No. 400-409

EPA Est. No.

TERRAZOLE 5% Granular Fungicide:

COMPOSITION

Active Ingredient: (% by weight)	
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	5%
Inert Ingredients:	95%
Total:	100%

EPA Reg. No. 400-419

EPA Est. No.

TERRAZOLE 25% Emulsifiable Turf & Ornamental Fungicide:

COMPOSITION

Active Ingredient: (% by weight)	
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	25.0%
Inert Ingredients:*	75.0%
Total:	100.0%

* Contains Petroleum Distillates

(Contains 2 lbs. 5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole per U.S. Gallon at 68F).

EPA Reg. No. 400-417

EPA Est. No.

UNIROYAL CHEMICAL CO., INC.: Fungicides(Continued):

Product Name:

TERRACLOR SUPER X Emulsifiable Soil Fungicide:

Controls Rhizoctonia, Pythium, Thielaviopsis and Fusarium Soil-Borne Seedling Diseases of Cotton

COMPOSITION

Active Ingredient:(% by weight)	
Pentachloronitrobenzene	23.2%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	5.8%
Inert Ingredients:	71.0%
Total:	100.0%
Contains 2 lbs. of Pentachloronitrobenzene and 0.5 lb. of 5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole per U.S. gallon at 68F.	

EPA Est. No. 400-405

EPA Est. No.

TERRACLOR SUPER X Granular Soil Fungicide for Cotton:

COMPOSITION

Active Ingredient:(% by weight)	
Pentachloronitrobenzene	10.0%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	2.5%
Inert Ingredients:	87.5%
Total:	100.0%

EPA Reg. No. 400-406

EPA Est No.

TERRACLOR SUPER X Granular Soil Fungicide with DI-SYSTON Systemic Insecticide:

COMPOSITION

Active Ingredient: (% by weight)	
Pentachloronitrobenzene	6.50%
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	1.63%
Disulfoton: O,O-Diethyl S-[2-ethylthio] ethyl] phosphorodithioate*	6.50%
Inert Ingredients:	85.37%
Total:	100.00%

* U.S. Patent No. 2,759,010

EPA Reg. No. 400-408

EPA Est. No.

262 *Fungicides, Biocides and Preservatives*

UNIROYAL CHEMICAL CO., INC.: Fungicides(Continued):

Product Name:

TERRAZOLE 35% Granular Turf & Ornamental Fungicide:

COMPOSITION

Active Ingredient: (% by weight)	
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	35%
Inert Ingredients:	65%
Total:	100%

EPA Reg. No. 400-416

EPA Est. No.

TERRAZOLE 4 Lb. Emulsifiable Fungicide:

Controls Certain Soil-Borne Diseases

COMPOSITION

Active Ingredient: (% by weight)	
5-Ethoxy-3-(trichloromethyl)-1,2,4-thiadiazole	45.8%
Inert Ingredients:	54.2%
Total:	100.0%
Contains 4 lbs. of 5-Ethoxy-3(trichloromethyl)-1,2,4-thiadiazole per U.S. Gallon at 68F.	

EPA Reg. No. 400-422

EPA Est. No.

U.S. PROFESSIONAL LABORATORIES: GROGAN Broad Spectrum Bactericide and Fungicide:

GROGAN Broad Spectrum Bactericide is extensively used worldwide for the routine treatment of metalworking fluids. Its history dates back more than 25 years and it is widely used by both formulators and end-users of metalworking fluids to prevent microbial contamination.

Product Advantages

- More than 25 years product history
- Proven efficacy against a broad range of bacteria and fungi
- For use in individual sumps as well as large central systems
- Helps protect machines, tools and work pieces from corrosion
- Extends the life of metalworking fluids
- Easy to use at an economical 0.15% w/w (1500 ppm) concentration
- Fast acting

Physical Properties

Appearance:	Yellow, viscous liquid
Color:	Gardner No. 12 Maximum
Odor:	Light amine
Specific Gravity:	1.155-1.160 @ 25C (9.62 pounds per gallon)
Refractive Index:	1.481-1.486 @ 25C
Flow Point:	-28C (-18F)
Viscosity:	300 CPS @ 25C (BROOKFIELD)

Composition:	Active Ingredients:	
	Hexahydro-1,3,5-tris (2-hydroxyethyl)-s-triazine	78.5%
	Inert Ingredients:	21.5%

EPA Registration #: 365-76

264 *Fungicides, Biocides and Preservatives*

R.T.VANDERBILT CO., INC.: Preservatives:

Product Name:

VANCIDE 51
Industrial Preservative

Paper Mill Slimicide
Cooling Towers
Mold-Resistant Paper and Paperboard
Preservation of Cotton Fabrics
Preservation for Paste
Wood Veneer
Preservation of Cutting Oils

Chemical Composition:	Sodium dimethyldithiocarbamate	27.6%
	Sodium 2-mercaptobenzothiazole	2.4%

Physical Form:	Liquid
Color:	Pale yellow-green
Density:	1.15 +- 0.02 Mg/cu m at 25(77F)

EPA Reg. No. 1965-8
EPA Est. No. 1965-KY-1

R.T.VANDERBILT CO., INC.: Preservatives(Continued):

Product Name:

VANCIDE 51Z

Wettable Powder Mildew Inhibition Agent, Preservative and Slime Control for Industry

U.S. Patents: 3,725,327 and 3,737,551

Preservation of Adhesives

Industrial Cooling Water Slime Control

Sanitizing Cleansing Compounds

Textile Mildew and Bacterial Growth Inhibition

Preservation of Industrial Yarns and Fabrics

Chemical Composition:	Zinc dimethyldithiocarbamate	87.0%
	Zinc 2-mercaptobenzothiazole	7.5%
	(Total zinc as metallic	19.8%)

Molecular Weight: 305.8 + 397.8

Density at 25C: 1.72 Mg/cu m

Physical Form: White to cream powder

Melting Range: Active ingredients melt 240 to 246C

E.P.A. REG. No. 1965-19

E.P.A. EST. No. 1965-KY-1

266 *Fungicides, Biocides and Preservatives*

R.T.VANDERBILT CO., INC.: Preservatives(Continued):

Product Name:

VANCIDE 51Z Dispersion

Textile preservation
Textile mildew and bacterial growth inhibition
Mold-resistant paper and paperboard
Preservation of adhesives
Paper mill slime control
Industrial cooling water slime control

Chemical composition: Zinc dimethyldithiocarbamate 46.0% plus
Zinc 2-mercaptobenzothiazole 4.0%
(Total zinc as metallic 10.5%)

Molecular weights: 305.8 + 397.8
Physical form: Liquid dispersion
Density: 1.26+-0.02 Mg/cu m
Color: White
Melting range: Solids melt 240 to 246C

EPA Reg. No. 1965-26
EPA Est. No. 1965-KY-1

R.T.VANDERBILT CO., INC.: Preservatives(Continued):

Product Name:

VANCIDE MZ-96

Industrial Preservative

U.S. Patent No. 3,725,327 and 3,737,551

VANCIDE MZ-96 is a free-flowing, white, water-dispersible powder used as an industrial preservative.

VANCIDE MZ-96 acts as a preservative in starch and adhesive formulations.

VANCIDE MZ-96 is a very effective mold or mildew inhibitor in latex or water-based coatings.

Preservative of adhesives

Mold inhibitor for Latex Paint

Chemical Composition: Zinc dimethyldithiocarbamate

Molecular Weight: 305.82

Assay: 96% Zinc dimethyldithiocarbamate(Ziram)

Total Zinc as Metallic: 20.6% minimum

Color: White

Physical Form: Powder

Density at 25C: 1.71 +- 0.03 Mg/cu m

Moisture Content: 1% maximum

Melting Range: 252 to 260C

EPA Reg. No. 1965-57

EPA Reg. No. 1965-79

268 *Fungicides, Biocides and Preservatives*

R.T.VANDERBILT CO., INC.: Preservatives(Continued):

Product Name:

VANCIDE TH
Industrial Preservative
U.S. Patent 3,775,590

Preservation of cutting oils
Preservation of Synthetic Rubber Latex
Preservation of adhesives
Preservation of latex paint and aqueous slurries

Chemical Composition: Hexahydro-1,3,5-triethyl-s-triazine
Molecular weight: 171.29
Physical form: Colorless to light yellow liquid
Density at 25C: 0.89 +/- 0.02 Mg/cu m (7.4 lbs/gallon)
Flash Point (TCC): 66C(150F)

E.P.A. Reg. No. 1965-55
E.P.A. Est. NO. 1965-KY-1

R.T.VANDERBILT CO., INC.: Preservatives(Continued):

Product Name:

VANCIDE 89
Industrial Preservative

Vinyl
Polyethylene
Paint
Lacquer
Soap
Wallpaper flour paste
Rubber and rubber coated articles

Chemical Composition: N-trichloromethylthio-4-cyclohexene-1,2-
dicarboximide

Assay: 92% minimum
Molecular weight: 300.6
Density at 25C: 1.69 +- 0.03 Mg/cu m
Physical form: Powder
Melting range: 168 to 174C(334 to 345F)

EPA Reg. No. 1965-11
EPA Est. No. 239-NJ-1

270 Fungicides, Biocides and Preservatives

VIKOL CHEMICAL CO., INC.: VIKOL #AF-25:

Durable Textile Bacteriostatic and Mildew Resistant Agent

VIKOL #AF-25 is a proven textile broad spectrum bacteriostatic and mildew resistant agent based on bis(tri-n-butyltin) oxide. It is a unique formulation which is designed especially for use on thermoplastic fibers.

VIKOL #AF-25 is an effective bacteriostatic and mildew resistant agent on nylon, wool and cotton and is especially effective on acrylic and polyester fibers. It has shown significant bacteriostatic activity after as many as 20 washings in an automatic washer tested against Staphylococcus aureus (ATCC #6538). VIKOL #AF-25 has been used to produce wash resistant bacteriostatic treatments on bath carpet, socks, shirtings, dress goods and many others for years.

VIKOL #AF-25 is self-emulsifying in water and exhausts well onto most textile fibers.

Product Specifications:

Appearance	Clear Liquid
Color	Liquid Amber
Density at 80F	0.92 gm/ml
Content of bis(tri-n-butyltin) oxide	25%
Evaporation Rate	Very low, <1

EPA Reg. No. 6390-11

EPA Establishment No. 6390-NC-2

VIKON CHEMICAL CO., INC.: VIKOL RQ:

Antibacterial and Antifungal Agent

VIKOL RQ is an antibacterial and antifungal agent for textile application. On textile fabrics, it imparts resistance to both Gram positive bacteria, such as Staphylococcus aureus (ATCC #6538) and to Gram negative bacteria such as Klebsiella pneumoniae (ATCC #4352) and Salmonella choleraesuis (ATCC #10708). It also imparts resistance to fungi such as Aspergillus niger (ATCC #6275), Chaetomium globosum (ATCC #6205), Penicillium citrinum (ATCC #9849), and many other mildew organisms.

VIKOL RQ contains as its active ingredient 50% of a mixed n-alkyl (60% C14, 30% C16, 5% C18) dimethyl benzyl ammonium chloride. It is recommended for use at concentrations sufficient to obtain a pickup of 1/4% of the product (0.125% of the active ingredient) on the fabric on its weight, for antibacterial activity. When antifungal activity on the fabric is required, a minimum of 1% (0.50% of the active ingredient) on the fabric is required.

VIKOL RQ shows strong synergistic antimicrobial activity when it is premixed with the VIKOL self-emulsifying bis(tri-n-butyltin) oxide products, VIKOL #AF-25 and VIKOL #LO-25.

Product Specifications

pH in solution	7-8
Average molecular weight	380

EPA Reg. No. 6390-09

EPA Establishment No. 6390-NC-2

272 *Fungicides, Biocides and Preservatives*

VINELAND CHEMICAL CO.: Microbiocides:

Product Name:

SLIMICIDE V-10

For control of bacterial and/or fungal slime in pulp & paper mills.

ECOPATIBLE

Active Ingredient:

1,4-Bis (bromoacetoxy)-2-butene

80%

Inert Ingredients

20%

100%

EPA Reg. No. 2853-24

EPA Est. No. 2853-NJ-1

VINELAND MBT 10%:

Methylenebis (Thiocyanate)

Industrial Microbiocide

Active Ingredient:

Methylenebis(thiocyanate)

10%

Inert Ingredients:

90%

100%

EPA Reg. No. 2853-43

EPA Est. No. 2853-NJ-1

Suppliers' Addresses

- | | |
|--|--|
| Abbott Laboratories
Chemical and Agricultural
Products Division
North Chicago, IL 60064 | Chapman Chemical Co.
P. O. Box 9158
416 E. Brooks Road
Memphis, TN 38109 |
| Agtrol Chemical Products
7324 Southwest Freeway
Suite 1800
Houston, TX 77074 | W.A. Cleary Corp.
P. O. Box 10
1049 Somerset St.
Somerset, NJ 08873 |
| Alco Chemical Corp.
P. O. Box 5401
909 Mueller Drive
Chattanooga, TN 37406-5401 | Cosan Chemical Corp.
400 Fourteenth St.
P. O. Box 7
Carlstadt, NJ 07072 |
| American Cyanamid Co.
Agricultural Division
Wayne, NJ 07470 | Dexol Industries
1450 228th St.
Torrance, CA 90501 |
| Angus Chemical Co.
2211 Sanders Road
Northbrook, IL 60062 | Diamond Shamrock Chemicals
Process Chemicals Division
350 Mt. Kemble Ave.
Morristown, NJ 07960-1931 |
| Bedford Chemical Division
Ferro Corp.
7050 Krick Road
Bedford, OH 44146 | Dow Chemical U.S.A.
Designed Products Dept.
Midland, MI 48640 |
| Beecham Home Improvement
Products, Inc.
Dayton, OH 45401 | Dow Chemical U.S.A.
Specialty Chemicals Dept.
Midland, MI 48640 |
| Betz Energy Chemicals, Inc.
Betz Laboratories, Inc.
Carpinteria, CA 93013 | E.I. duPont de Nemours & Co.
Agricultural Products Dept.
Wilmington, DE 19898 |
| Buckman Laboratories, Inc.
P. O. Box 8305
1256 N. McLean Blvd.
Memphis, TN 38108 | Eastern Color & Chemical Co.
35 Livingston St.
Providence, RI 02940 |
| Calgon Corp.
Specialty Chemicals Group
Box 1346
Pittsburgh, PA 15230 | FMC Corp.
Agricultural Chemical Group
2000 Market St.
Philadelphia, PA 19103 |
| California Products Corp.
169 Waverly St.
P. O. Box 569
Cambridge, MA 02139 | Great Lakes Chemical Corp.
P. O. Box 2200
Highway 52 N.W.
West Lafayette, IN 47906 |

Griffin Ag Products Co., Inc.
P. O. Box 1847
Valdosta, GA 31603-1847

Gustafson, Inc.
P. O. Box 660065
Dallas, TX 75266-0065

Hopkins Agricultural Chemical
Box 7532
Madison, WI 53707

Kincaid Enterprises, Inc.
P. O. Box 671
Nitro, WV 25143

Koppers Co., Inc
Protection Products
5137 Southwest Ave.
St. Louis, MO 63110-3497

Leffingwell
111 South Berry St.
P. O. Box 1880
Brea, CA 92621

M & T Chemicals, Inc.
Rayway, NJ 07065-0970

Maag Agrochemicals, Inc.
P. O. Box 6430
Vero Beach, FL 32961-6430

Mallinckrodt, Inc.
St. Louis, MO 63147

Miller Chemical & Fertilizer
P. O. Box 333
Radio Road
Hanover, PA 17331

Mobay Chemical Corp.
Agricultural Chemicals Div.
P. O. Box 4913
Hawthorn Road
Kansas City, MO 64120-0013

Mooney Chemicals, Inc.
2301 Scranton Road
Cleveland, OH 44113

Morton Thiokol, Inc.
Ventron Products
150 Andover St.
Danvers, MA 01923

Nuodex, Inc.
Turner Place
P. O. Box 365
Piscataway, NJ 08854

O'Brien Industries, Inc.
2686 Lisbon Road
Cleveland, OH 44104

Olin Chemicals
120 Long Ridge Road
P. O. Box 1355
Stamford, CT 06904-1355

Pennwalt Corp.
Agchem Division
Philadelphia, PA 19102

Rhone-Poulenc, Inc.
Agrochemical Division
Monmouth Junction, NJ 08852

Rohm and Haas Co.
Independence Mall West
Philadelphia, PA 19105

The O. M. Scott & Sons Co.
Marysville, OH 43041

Standard Tar Products Co., Inc.
2456 West Cornell St.
Milwaukee, WI 53209-6294

Stauffer Chemical Co.
Westport, CT 06881-0854

Tennessee Chemical Co.
3475 Lenox Road, N.E.
Suite 670
Atlanta, GA 30326

Troy Chemical Corp., Inc.
One Avenue L
Newark, NJ 07105

276 Fungicides, Biocides and Preservatives

Union Carbide Corp.
Specialty Chemicals Division
39 Old Ridgebury Road
Danbury, CT 06817-0001

Uniroyal Chemical Co., Inc.
Middlebury, CT 06749

U.S. Professional Laboratories
Lehn & Fink Products Group
Sterling Drug, Inc.
225 Summit Ave.
Montvale, NJ 07645

R.T. Vanderbilt Co., Inc.
Specialties Dept.
30 Winfield St.
Norwalk, CT 06855

Vikon Chemical Co., Inc.
P. O. Box 1520
Burlington, NC 27216

Vineland Chemical Co., Inc.
P. O. Box 745
Vineland, NJ 08360

Trade Name Index

Trademark/Trade Name	Company
ACTI-DIONE	Dexol Industries
ALLETTE	Rhone Poulenc, Inc.
AMICAL	Abbott Laboratories
AQUATREAT	Alco Chemical Corp.
AQUCAR	Union Carbide Corp.
BANROT	Mallinckrodt, Inc.
BASICOP	Griffin Corp.
BAYLETON	Mobay Chemical Corp.
BENLATE	DuPont
BENOMYL	Miller Chemical & Fertilizer
BETZ ENCHEM	Betz Energy Chemicals, Inc.
BETZ ENTEC	Betz Laboratories, Inc.
BIOBAN	Angus Chemical Corp.
BIOCHEK	Calgon Corp.
BIOMET	M & T Chemicals, Inc.
BIOMET TBTF	M & T Chemicals, Inc.
BODOXIN	Angus Chemical Co.
BRAVO	Fermento Plant Protection Co.
BROMICIDE	Great Lakes Chemical Corp.
BROMOSAN	W.A. Cleary Chemical Corp.
BUSAN	Buckman Laboratories
CADDY	W.A. Cleary Chemical Corp.
CADMINATE	Mallinckrodt, Inc.
CALGON	Calgon Corp.
CALO-CLOR	Mallinckrodt, Inc.
CALO-GRAN	Mallinckrodt, Inc.
CAPTEC	Griffin Corp.
CHAMPION	Agtrol Chemical Products

Trademark/Trade Name	Company
CHAMPION FLOWABLE	Agtrol Chemical Products
CHLORONEB	Kincaid Enterprises, Inc.
CLEARY'S CAD-TRETE	W.A. Cleary Chemical Corp.
COPPER NAP-ALL	Mooney Chemicals, Inc.
COPPER TREAT	Koppers Co., Inc.
COPZIN	Agtrol Chemical Products
COSAN	Cosan Chemical Corp.
COTIN	Cosan Chemical Corp.
CUNAPSOL	Chapman Chemical Co.
CUNILATE	Morton Thiokol, Inc.
CUNIPHEN	Morton Thiokol, Inc.
CYPREX	American Cyanamid Co.
DBNPA	Dow Chemical U.S.A.
DEXOL ACTI-DIONE PM	Dexol Industries
DEXOL BENOMYL	Dexol Industries
DEXOL THIRAM PLUS	Dexol Industries
DEXOL ZINEB	Dexol Industries
DICHLONE	Hopkins Agricultural Chemicals
DIFOLATAN	Chevron Chemical Co.
DI-SYSTON	Uniroyal Chemical Co., Inc.
DOWICIDE	Dow Chemical U.S.A.
DOWICIL	Dow Chemical U.S.A.
DUOSAN	Mallinckrodt, Inc.
DUROTEX	Morton Thiokol, Inc.
DU-TER FLOWABLE	Griffin Corp.
ECCO	Eastern Color & Chemical Co.
ECCOCIDE	Eastern Color & Chemical Co.
ECOPATIBLE	Vineland Chemical Co.
ELVALOY	DuPont
FOLPET (PHALTAN)	Stauffer Chemical Co.
FUELSAVER	Angus Chemical Co.
FUNGINEX	FMC Corp.
FUNGITROL	Nuodex, Inc.
FUNGITROL TINOX	Nuodex, Inc.
FUNGO	Mallinckrodt, Inc.
GROTAN	U.S. Professional Laboratories
GUSTAFSON APRON	Gustafson, Inc.
GUSTAFSON BOTRAN	Gustafson, Inc.
GUSTAFSON EVERSIELD	Gustafson, Inc.
GUSTAFSON FLO-PRO	Gustafson, Inc.
GUSTAFSON LORSBAN	Gustafson, Inc.
GUSTAFSON PRO-GRO	Gustafson, Inc.
GUSTAFSON RTU-PCNB	Gustafson, Inc.
GUSTAFSON TERRACLOR SUPER-X	Gustafson, Inc.
GUSTAFSON TERRA-COAT	Gustafson, Inc.
GUSTAFSON TOPS	Gustafson, Inc.
GUSTAFSON VITAVAX	Gustafson, Inc.

Trademark/Trade Name	Company
GUSTAFSON VITAVAX-HB POUR-ON	Gustafson, Inc.
GUSTAFSON 4-WAY	Gustafson, Inc.
KATHON	Rohm and Haas
K-COP	Griffin Corp.
KE	Gustafson, Inc.
KOBAN	Mallinckrodt, Inc.
KOCIDE	Griffin Corp.
KROMAD	Mallinckrodt, Inc.
MANEB	Miller Chemical & Fertilizer
MANEB	Pennwalt Corp.
MANEX	Griffin Corp.
MANZATE	DuPont
MERBAC	Calgon Corp.
MERTECT LSP	Gustafson, Inc.
METASOL	Calgon Corp.
M-GARD	Mooney Chemicals, Inc.
MICRO-CHEK	Bedford Chemical Division
MILBAN	Mallinckrodt, Inc.
MITROL	Chapman Chemical Co.
MOLY	Gustafson, Inc.
NOPCOCIDE	Diamond Shamrock Chemicals
NUOCIDE	Nuodex, Inc.
NUODEX	Nuodex, Inc.
NUOPHENE	Nuodex, Inc.
NUOSEPT	Nuodex, Inc.
NUTRA-SPRAY	Leffingwell
NYTEK	Maag Agrochemicals, Inc.
O'B ALGE	O'Brien Industries
ORGANICLEAR	Standard Tar Products Co.
ORNALIN	Mallinckrodt, Inc.
PENNCOZEB	Pennwalt Corp.
PLANTVAX	Uniroyal Chemical Co., Inc.
PMAS	W.A. Cleary Chemical Corp.
PRO-TEX	Griffin Corp.
QUINDEX	Nuodex, Inc.
ROVRAL	Rhone Poulenc, Inc.
SAPSTEIN CONTROL CHEMICAL	Koppers Co., Inc.
SCOTTS PROTURF	The O.M. Scott & Sons Co.
SLIMICIDE V-10	Vineland Chemical Co.
SOCCI	Morton Thiokol, Inc.
SODIUM OMADINE	Olin Chemicals
SPOTRETE	W.A. Cleary Chemical Corp.
S.S.T. SUMP SAVER	Angus Chemical Co.
STORM STAIN	California Products Corp.
SUPER AD-IT	Nuodex, Inc.
SUPER SIX	Griffin Corp.
SUPER TIN	Griffin Corp.

Trademark/Trade Name	Company
TEKTAMER	Calgon Corp.
TENN-COP	Tennessee Chemical Co.
TERRACLOR	Uniroyal Chemical Co., Inc.
TERRACLOR SUPER X	Uniroyal Chemical Co., Inc.
TERRANEBS	Kincaid Enterprises, Inc.
TERRAZOLE	Uniroyal Chemical Co., Inc.
TERSAN	DuPont
THIRAMAD	Mallinckrodt, Inc.
TIMBERTREAT	Koppers Co., Inc.
TK-100	Calgon Corp.
TK-100 DISPERSION W	Calgon Corp.
TOPSIN	Pennwalt Corp.
TRIADINE	Olin Chemicals
TRIBUCIDE	Koppers Co., Inc.
TRIS NITRO	Angus Chemical Co.
TROYSAN	Troy Chemical Corp.
TROYSAN POLYPHASE	Troy Chemical Corp.
TRUBAN	Mallinckrodt, Inc.
TURFCIDE	Uniroyal Chemical Co., Inc.
UCARCIDE	Union Carbide Corp.
UCONEX	Union Carbide Corp.
VANCIDE	R.T. Vanderbilt Co., Inc.
VINYZENE	Morton Thiokol, Inc.
VIKOL	Vikon Chemical Co., Inc.
VINELAND	Vineland Chemical Co.
VORLAN	Mallinckrodt, Inc.
WOLMANIZED	Koppers Co., Inc.
WOLMAN TREAT OO	Koppers Co., Inc.
WOODGUARD	Chapman Chemical Co.
WOODLIFE	Beecham Home Improvement Products, Inc.
WOODTREAT	Koppers Co., Inc.
ZINC NAP-ALL	Mooney Chemicals, Inc.
ZINC OMADINE	Olin Chemicals
ZIRAM	Pennwalt Corp.
ZYBAN	Mallinckrodt, Inc.
3336	W.A. Cleary Chemical Corp.

Chemical Name Index

Index terms

Links

A

Alkyl amine hydrochlorides	77	79
N-Alkyl dimethyl benzyl ammonium chloride	26	32
n-Alkyl-1,3-propylene diamines	20	
Aluminum tris(O-ethylphosphonate)	230	

B

Benomyl: (methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate)	91	102	103	178
Benzyl bromoacetate	47			
1,4-Bis(bromoacetoxy)-2-butene	272			
1,3-Bis(hydroxymethyl)-5,5dimethylhydantoin	46			
Bis(tri-n-butyltin)oxide	26	32	55	89 144
	145	152	202	270 271
Bis(trichloromethyl) sulfone	24			
Bromochlorodimethylhydantoin	30	109		
2-Bromo-4'-hydroxyacetophenone	35			
B-Bromo-B-nitrostyrene	22	23		
1,1'-(Butenylene)bis(3,5,7-triazoniaadamantane chloride)	78	81		

C

Cadmium chloride	68	69	70	
Cadmium sebacate	175			
Cadmium succinate	167			
Calcium polysulfide	178			
Captan : (N -[(trichloromethyl)thiol-4-cyclohexene-1,2-dicarboximide	111	124	125	126 127
	128	134		

<u>Index terms</u>	<u>Links</u>				
Captan related derivative	124	125	126	127	128
	134				
Carbamate compound	42				
Carboxin: (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide	130	134	135	136	38
Cationic nitrogen based compounds	38				
1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride	101				
Chlormethoxypropyl mercuric acetate	244				
5-Chloro-2-methyl-4-isothiazolin, 3-one	231	232	233	234	
Chlorophenols and related compounds	25				
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1H-1,2,4-triazol-1-yl)-2-butanone	179	236	237	238	
Chlorpyrifos: (O,O-diethyl-O-(3,5,6-trichloro-2-pyridyl)phosphorothioate)	129				
Coordination product of zinc ion and manganese ethylene bisdithiocarbamate	102	103	166	170	227
Copper	92				
Copper-ammonium complex	113				
Copper carbonate, basic	150				
Copper hydroxide	114	115	116	117	118
Copper-8-hydroxy-quinoline	107				
Copper naphthenate	56	57	140	141	146
182	183	209			
Copper-8-quinolinolate	59	60	61	62	63
	147	155	156	157	158
	184	188	215	216	217
	218	219	220		
Copper salts of fatty and rosin acids	241				
Copper sulfate, basic	5	110	150	242	
Cupric hydroxide	5	117	118		
4-Cyclododecyl-2,6-dimethylmorpholinium acetate	160				
Cycloheximide	94				

<u>Index terms</u>	<u>Links</u>				
D					
1 2-Dibromo-2,4dicyanobutane	50	51	52		
2 2-Dibromo-3-nitrilopropion-amide (DBNPA)	33	98			
Dibromopropionamide compound	41				
Dichlone: (2,3dichloro-1,4-naphthoquinone)	137				
1 4-Dichloro-2,5-dimethoxybenzene	127	128	138	139	237
1 3-Dichloro-5,5-dimethylhydantoin	27				
2 6-Dichloro-4-nitroaniline	124				
3-(3,5-Dichlorophenyl)-5-ethenyl-5-methyl-2,4-oxazolidinedione	161	177			
3-(3,5-Dichlorophenyl)-N-(methyl ethyl)-2,4-dioxo-1-imidazolidinecarboxamide	237				
Didecyl dimethyl ammonium chloride	142				
Diethyl 4,4'-o-phenylenebis(3-thioallophanate)	64	65	66	67	
Dihydroxy-dichloro diphenyl methane	211				
Diiodomethyl-p-tolylsulfone	2	3	4		
O O-Dimethyldithiophosphate of diethyl mercaptosuccinate	127				
4,4-Dimethyloxazolidine	8	75	212		
3-[2-(3,5-Dimethyl-2-oxocyclohexyl)-2-hydroxyethyl] glutarimide	90	94			
Dimethyl 4,4'-o-phenylenebis(3-thioallophanate)	159	171	238		
3,5-Dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione	87	250			
Di(phenylmercuric)dodecanyl succinate	221				
Di(phenylmercury)didenyl succinate	247				
Diphenyl-stibine 2-ethylhexoate	153				
Disulfoton: (O,O-diethyl S-[2-(ethylthio)ethyl] phosphorodithioate)	261				
Dodecyl dimethylbenzylammonium salt of naphthenic acid	208				
Dodecylguanidine hydrochloride	21	28			
Dodine: (n-dodecylguanidine acetate)	7				

<u>Index terms</u>	<u>Links</u>				
E					
5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole	128	131	132	159	162
	163	164	165	172	173
	174	260	261	262	
4,4'-(2-Ethyl-2-nitrotrimethylene)dimorpholine	12	14			
F					
Folpet: (N-(trichloromethylthio)-phthalimide)	55	82	200	201	240
G					
Glutaraldehyde	39	253	254	256	257
H					
Hexahydro-1,3,5-triethyl-s-triazine	268				
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine	10	226	263		
5-Hydroxymethoxymethyl-1-aza-3,7-dioxabicyclo(3,3,0) octane	11	213			
2-[(Hydroxymethyl)amino] ethanol	74	251			
2-[(Hydroxymethyl)amino]-2-methylpropanol	252				
Hydroxymethyl-5,5-dimethylhydantoin	46				
2-Hydroxymethyl-2-nitro-1,3-propanediol	9				
5-Hydroxypoly(methyleneoxy),methyl-1-aza-3,7- dioxabicyclo(3,3,0)octane	11	213			
I					
Imazilil: (1-(2-(2,4-dichlorophenyl)-2-(2- propenyloxy)ethyl) -1H-imidazole)	128				
3-Iodo-2-propynyl butyl carbamate	18	19	142	148	149
	248	249			
Iprodione: (3-(3,5dichlorophenyl)-N-(1-methylethyl)- 2,4dioxo-1-imidazolidinecarboxamide)	230	235	236		
Isothiazoline compounds	43				

<u>Index terms</u>	<u>Links</u>
L	
Lindane: (gamma isomer of benzene hexachloride)	129 131 135 143
M	
Malathion	127
Maneb: (manganese ethylene bisdithiocarbamate)	93 119 120 128 135 178 227
Mercuric chloride	168 169
Mercurous chloride	168 169
Metalaxyl: (N-(2,6-dimethylphenyl)-N-(methoxyacetyl)alanine methyl ester)	123 237 238
Methanol [[[2-(dihydro-5-methyl-3(2H)-oxazolyl)-1-methylethoxy]methoxy]methoxy]	76
Methoxychlor: (2,2-bis(p-methoxyphenyl)-1,1,1-trichloroethane)	125 130
2,2'-Methylenebis(4-chlorophenol) sodium salt	104 105 106 185 186 105
Methylenebis(thiocyanate)	21 22 24 25 28 272
2-Methyl-4-isothiazolin-3-one	231 232 233 234
N	
Nabam/Dibam	6
4-(2-Nitrobutyl)morpholine	12 14
O	
2-n-Octyl-4-isothiazolin-3-one	17
Organometallic compounds	37 38
10,10'-Oxybisphenoxarsine (OBPA)	189 190 191 192 193 194 195 196 197 198 199
Oxycarboxin: (5,6-dihydro-2-methyl-1,4-oxathiin-3-carboxanilide-4,4-dioxide)	258

Index terms**Links****P**

Parachlorometacresol	83				
Pentachloronitrobenzene	128	130	131	132	135
	235	258	259	260	261
Pentachlorophenol	25				
Phenylmercuric acetate	71	80	84	85	210
	214	235	236	245	246
Phenylmercuric oleate	86				
o-Phenylphenol	99				
Phorate: (O,O-diethyl S-(ethylthio) methyl phosphorodithioate)	260				
Potassium chromate	175				
Potassium dimethyldithiocarbamate	6				
Potassium N-hydroxymethyl-N- methylthiocarbamate	34				

Q

Quaternary ammonium compounds	36	37			
-------------------------------	----	----	--	--	--

S

Sodium dimethyldithiocarbamate	6	264			
Sodium hypochlorite	31				
Sodium 2-mercaptobenzothiazole	207	264			
Sodium pentachlorophenate	58				
Sodium-o-phenylphenate tetrahydrate	100				
Sodium 2-pyridinethiol-1-oxide	226				
Sodium pyrithione	223				
Sodium salts of chlorophenols	58				
Sulfur	116	121			

T

Tetrachloroisophthalonitrile	96	97	205	206	
Tetrahydro-3,5dimethyl-2H-1,3,5-thiadiazine-2-thione	48	49			

<u>Index terms</u>	<u>Links</u>				
2-(4-Thiazolyl)benzimidazole	53	54			
Thiophanate-methyl: (dimethyl [(1,2-phenylene)bis(iminocarbonothioyl)] bis[carbamate])	133	166	178	228	235
	236				
Thiram: (tetramethylthiuram disulfide)	66	67	69	70	72
	73	94	130	133	134
	136	175	176	235	236
Triadimefon: (1-(4-chlorophenoxy)-3,3-dimethyl-1-(IH-1,2,4-triazol-1-yl)-2-butanone)	237				
Tributyltin benzoate	77				
Tributyltin fluoride	151	154			
Tributyltin oxide	152				
Tributyltin salicylate	81	88			
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide	269				
N-(Trichloromethylthio)phthalimide	243				
Trichloro-s-triazinetriene	29				
Triforine: (N,N'-[1,4-piperazinediyl-bis(2,2,2-trichloroethylidene)]bisformamide)	108				
Trimethylolmelamine	187				
3,4,4-Trimethyloxazolidine	8	75	212		
Triphenyltin hydroxide	112	120	122		
Tris(hydroxymethyl)nitromethane	15	16			
 Z					
Zinc dimethyldithiocarbamate	265	266	267		
Zinc 2-mercaptobenzothiazole	265	266			
Zinc naphthenate	56	181	183	203	204
Zinc pyrithione	224	225			
Zineb: (zinc ethylenebisdithiocarbamate)	95				
Ziram: (zinc dimethyldithiocarbamate)	229	267			