



**FILMGUARD™ IPBC 100 Fungicidal Agent,
FILMGUARD™ IPBC 40 Fungicidal Agent and
FILMGUARD™ IPBC 20 Fungicidal Agent
Products for Protection Against Fungal Growth**

CAS Reg. No. 55406-53-6

General

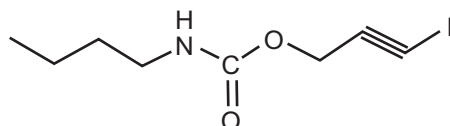
FILMGUARD™ IPBC Fungicidal Agent series of products from Dow Biocides are based on a broad spectrum fungicide active which is effective against a wide variety of fungal organisms known to cause mildew on coated surfaces.

Formulations including FILMGUARD IPBC Fungicidal Agents offer excellent “dry film” fungal protection in interior and exterior paints, coatings, and wood protective stains and wood preservatives. It may also be used as a fungicide in paper coatings, inks, adhesives, sealants and cordage.

	FILMGUARD™ IPBC 100	FILMGUARD™ IPBC 40	FILMGUARD™ IPBC 20
EPA Reg. Nos	72304-5-464	72304-6-464	72304-7-464

FILMGUARD IPBC products are compatible with both waterborne as well as solvent based formulations.

Structural Formula



3-Iodopropynylbutylcarbamate

Physical Properties and Composition

The following are typical physical properties of FILMGUARD IPBC Fungicidal Agents; **these properties and composition should not be considered as product specifications, and are meant for guidance only.**

Physical Properties	FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
Appearance	Off white solid	Clear amber liquid	Clear amber liquid
pH (0.1% in water, 25°C):	5.0 (approximate)	4.5 – 5.5	4.5 – 5.5
Viscosity (20°C)	Not applicable	9.5 centipoises (typical)	16.7 centipoises (typical)
Solubility	Soluble in aromatic and alcohol based solvents		
Specific gravity (25°C):	1.51 – 1.57	1.13 – 1.16	1.03 – 1.06
Pounds/gallon	n/a	9.4 – 9.7	8.6-8.8
Boiling point	n/a	160°C	160°C
Decomposition point	220°C	220°C	220°C
Composition			
3-Iodopropynylbutylcarbamate	98% (nominal)	40.0 % (nominal)	20 % nominal
Inert Carrier (proprietary)	none	60% approx	80% approx

Special Features and Benefits

Feature	Benefit
Non-metallic biocide	Does not rely on organo-metallic agent such as Tin, Mercury, or Arsenic for activity.
Broad spectrum	Effective against a range of deterioration and defacement causing fungi.
Wide range of applications	Applicable for both interior and exterior coatings, aqueous and solvent based formulations.
Activity in both dry and wet-state of your products	Capable of providing protection from fungal attack in wet-state of products such as adhesives, inks and paper coating emulsions, while protecting their dry-state end-use applications.

Antimicrobial Activity

Fungi	MIC (mg/L) of FILMGUARD™ IPBC in nutrient agar
<i>Alternaria alternata</i>	2
<i>Aspergillus niger</i>	2
<i>Aureobasidium pullulans</i>	1
<i>Cephalosporium fragrans</i>	2
<i>Ceratocystis pilifera</i>	1
<i>Chaetomium globosum</i>	5
<i>Cladosporium cladosporoides</i>	2
<i>Gliocladium virens</i>	5
<i>Lentinus tigrinus</i>	2
<i>Penicillium glaucum</i>	1
<i>Phialophora fastigiata</i>	2
<i>Sclerophoma pityophila</i>	1
<i>Trichoderma virens</i>	2
Yeasts	
<i>Rhodotorula rubra</i>	20
<i>Sporobolomyces roseus</i>	7.5
Bacteria	
<i>Escherichia coli</i>	1000
<i>Staphylococcus aureus</i>	200

Applications/ Directions for Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling. This formulation is not approved under the Federal Food, Drug and Cosmetic Act for use in manufacture of food grade adhesive, paper and paper board products and paper coating. The guidance provided below is for use levels of the products as supplied unless otherwise mentioned.

Adhesives

FILMGUARD™ IPBC Fungicidal Agents products can be used as an additive to non-medical, non-food use natural and synthetic adhesive formulations, caulks, patching compounds, sealants, grouts, latexes used in the manufacture of flooring adhesives and carpet backings to prevent the growth of fungal organisms in the material, both in the wet-state and in the dry-film of the finished product. Recommended use levels are provided below are on wet formulation weight.

Dosage amounts for Non-Food contact systems only

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.02 - 0.25%	0.05 - 0.625%	0.1 - 1.25%

This product should be added toward the end of production cycle with good agitation to ensure uniform distribution. For example, to inhibit the growth of mildew on a latex-based wall cover adhesive for a non-food area, add 0.5%, i.e., 5 lbs. of FILMGUARD™ IPBC 40 per 1000 lbs. of latex-based adhesive formulation.

Cordage

FILMGUARD IPBC Fungicidal Agents may be used as a mildewcide in both aqueous and solvent based process formulations which coat cordage. Typical use levels of this product are shown below for different types of cordages. This product should be added to the process formulation at the end of the production cycle with good agitation to prevent possible mechanical losses and to ensure a uniform distribution. For example, to inhibit the growth of mildew on cotton canvas intended for a non-food area, add 1.25% of FILMGUARD IPBC 40 (12.5 lbs. per 1000 lbs. of cordage formulation) to the process formulation.

Dosage amounts for Cordage

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.02 - 1.0%	0.05 - 2.5%	0.1 - 5.0%

Inks

FILMGUARD IPBC Fungicidal Agents may be used in aqueous-based ink solutions for protection of these solutions against attack by fungal organisms. It is recommended that this product be added at the end of the production cycle with good agitation. This product will generally impart protection when used at levels of 0.05 - 3.0% of active ingredient based on the formula weight. Optimization of levels needed by fungal challenge tests are recommended.

Paints and Stains

FILMGUARD IPBC Fungicidal Agents, used in solvent and waterborne paints and stains, will inhibit the growth of mildew. Addition should be at the end of the manufacturing process and allowed to mix long enough to be adequately dispersed. It should not be added to hot paint. For example, house paint with a wet density of 10 lbs. per gallon would use 2.5 - 12.0 lbs. of FILMGUARD IPBC 40 product per 100 gallons of wet paint. Where the climate is severe and mildew growth is a major problem for painted surfaces, additional amounts would be required, as much as 2.0% by weight in the paint. For interior paint use, approximately half the exterior concentrations can be used. Appropriate levels are best determined by field trials.

Dosage amounts for Paints and Stains (exterior)

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.1 - 0.8%	0.25 - 1.20%	0.5 - 2.4%

Plastics and Plastic Coatings

FILMGUARD IPBC Fungicidal Agents may be used to prevent surface mildew growth on plastic items such as shower curtains, wire & cable insulation, and sun umbrellas and is suited for plastics such as PVC. This product should be dispersed in the plasticizer or color concentrate before it is incorporated into the resin to ensure uniform distribution. Use of this product is not recommended if the heat of processing is above 350°F for prolonged periods. It should not be used in plastics that will have contact with food or medical device applications.

Dosage amounts for Plastics and Plastic coatings

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.05 - 1.0%	0.125 - 2.5%	1.5 - 5.0%

Paper Coatings

FILMGUARD™ IPBC 40 may be used as a mildewcide in both aqueous and solvent-based coatings which are applied to paper and cardboard substrates. This product can be used to prevent mold and mildew from growing on products such as corrugated cardboard or soap wrappers, wall covers, non-food contact packaging materials, and non-food contact paper tapes. Use levels for these products are shown below. This product should be added at the end of the production cycle and with good agitation to prevent possible mechanical losses and ensure uniform distribution.

Dosage amounts for Paper coatings – non-food contact applications only

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.02 - 0.75%	0.05 - 2.0%	0.1 - 3.75%

For example, to inhibit growth of mildew on corrugated cardboard intended for non-food packaging, add 12.5 lbs. FILMGUARD IPBC 40 per 1000 lbs. of coating material formulation.

Wood Preservation

FILMGUARD IPBC Fungicidal Agents may be applied from solvent solutions or aqueous dispersions to new lumber, plywood and particle board to prevent the growth of mildew, sapstain and wood rot on these substrates. This product is recommended for use on wood in above ground use only. Treating solutions may be prepared by diluting this product in alcohols or aromatic solvents or by dispersion in water. Suggested levels depend upon the severity of conditions for end use, and the extent of time that protection is required.

FILMGUARD IPBC 40 is a liquid designed for use as an additive to interior or exterior protective coatings for inhibiting growth of mildew on the film surface. It is also recommended as a wood preservative for use in above ground applications. All recommendations of use levels are in percentage by weight of FILMGUARD IPBC 40. Dosage ranges are given for various applications to indicate the approximate levels for a that particular application. More accurate levels of use should be determined by field trials.

Dosage amounts for Wood treatment

FILMGUARD IPBC 100	FILMGUARD IPBC 40	FILMGUARD IPBC 20
0.1 - 1.5%	0.25 - 3.0%	0.5 - 6.0%

A one minute dip at ambient temperatures in a solution or aqueous dispersion containing a starting level 0.5% of FILMGUARD IPBC 40 should be adequate to control the development of mildew and sap-stain organisms on the freshly sawn lumber. Due to the great variation in susceptibility of fresh sawn lumber that relates to the type of wood, sawing and storage techniques, conditions of humidity or method of treatment, it is usually necessary to carry out field tests to determine the most appropriate means of application and the optimum concentration of this product to be used within the range specified.

For best results, lumber should be treated within 24 hours of sawing. The lumber should be completely immersed in the treating bath and treating vat designed to permit complete immersion and removal, and to minimize spillage. The vat may be cleaned by emptying and

rinsing with a suitable solvent, or by use of a detergent solution. To add additional product while treating, first prepare the proper solution or emulsion in a separate container (of wood, plastic, or stainless steel construction) and add to the treating vessel.

After treatment, lumber should be stacked in a properly maintained seasoning yard with good drainage so that water will not accumulate in any area. The yard should be kept free from weeds and vegetation which may hold moisture and promote growth of decay and stain-producing fungi. All debris and lumber scraps should be removed from the area. A properly laid out yard should take advantage of prevailing winds to permit good air circulation. Main alleys should be at least 16 feet wide. Stack foundations should be sufficiently elevated to permit ready access of air to the pile, and allow water to drain off quickly.

Toxicology

Acute Oral LD₅₀ in rats = 1,100-3090 mg/kg (active ingredient)
Dermal Toxicity in rats > 2000 mg/kg (active ingredient)
Acute Inhalation 4 hour LC₅₀ in rats = 0.68-1.09 mg/l (active ingredient)
Eye: Causes eye irritation
Skin: May cause allergic skin reaction.

Ecotoxicity

Material is highly toxic to aquatic organisms on an acute basis. Do not allow product to enter waterways.

For further information please refer to the Safety Data Sheet and Product Label.

First Aid

Eye Contact: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses if present. Seek medical attention.

Skin Contact: Promptly wash contaminated area with plenty of water for 15-20 minutes. Remove and wash contaminated clothing. Seek medical attention.

Inhalation: Remove to fresh air at once. Seek prompt medical attention.

Ingestion: Immediately call a poison control center or physician. Do not induce vomiting unless instructed to do so by a medical professional.

For full details on First Aid please refer to the Safety Data Sheet.

Storage, Handling, and Disposal

Handling

Keep away from heat sparks and flame. Avoid contact with eyes, skin and clothing. Avoid breathing vapor. Use with adequate ventilation. When handling product directly, personal protective equipment, including chemical splash goggles, chemically resistant gloves and apron should be worn. Maintain atmospheric levels below the exposure guideline.

Storage

FILMGUARD™ IPBC Fungicidal Agents should be stored at temperatures within the range of 4° to 40°C. Containers should not be exposed to direct sunlight. Storage conditions should also be in conformance with applicable legal, fire, insurance and local regulations.

Keep container tightly closed when not in use. Do not reuse container. Do not store with strong oxidizing agents or strong (concentrated) acids. Do not contaminate water, food, or feed by storage or disposal.

Pesticide Disposal

If excess product cannot be used according to use directions, send to an approved waste handling facility according to local regulations for disposal.

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. For wastes which cannot be disposed of by use according to label instructions, contact your local State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest Environmental Protection Agency (EPA) Regional Office for guidance.

Container Disposal

Triple rinse and send rinsate to waste. Then offer containers for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration or, if allowed by state and local authorities, by burning. If burned, avoid smoke.

Spill Handling and Deactivation Procedures

Use appropriate safety equipment.

Spills can be absorbed by appropriate inert materials such as clay, sand or Vermiculite. Care should be taken to prevent contact with any exposed skin of the personnel conducting the clean up. With solid material avoid creation of dusts during clean-up. These materials can be disposed according to local regulations.

Refer to Safety Data Sheet for additional information.

Product Stewardship

Dow Biocides encourages its customers to review their applications of Dow Biocides products from the standpoint of human health and environmental quality. To help ensure that Dow Biocides products are not used in ways for which they are not intended or tested, Dow Biocides personnel are willing to assist customers in dealing with ecological and product safety considerations. Contact your representative if you need any assistance or information. When considering the use of any Dow product in a particular application, review the latest Safety Data Sheet and country-specific product label to ensure the intended use is within the scope of approved uses and can be accomplished safely. Before handling any of the products mentioned in the text, obtain available product safety information and take necessary steps to ensure safety of use.

For further information visit our website:

www.dowbiocides.com

or call:

United States and Canada:	1-800-447-4369 (phone)
	1-989-832-1560 (phone)
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	32-3-450-2815 (fax)
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Other Global Areas:	1-989-832-1560 (phone)
	1-989-832-1465 (fax)

†except Indonesia and Vietnam

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