

PRODUCT NAME

Multimodulus loudspeaker cabinet material

MANUFACTURER

US Enclosure Company

PRODUCT DESCRIPTION

Multimodulus is an advanced composite product for loudspeaker cabinets.

COMPOSITION

Multimodulus is a solid, non-porous material homogeneously composed of proprietary composite materials

COLORS

Almost unlimited working palette using dyes incorporated during manufacture.

PERFORMANCE PROPERTIES

Typical performance properties of Multimodulus are shown in Table 1

Multimodulus surfaces are renewable unless painted. It can be fully restored with ordinary mild abrasive cleansers, a scouring pad or very fine sandpaper. Cigarette burns, for example, can be easily removed in this way. Damage caused by abuse can usually be repaired on site. Multimodulus is an inert and non-toxic material. Under normal temperature conditions found inside loudspeaker cabinets, it does not emit gases. When burned it releases mainly carbonic gas and the smoke generated is optically light and does not contain toxic halogenated gases. Because of these properties, Multimodulus can be used in public spaces.

FACTORY REQUIREMENTS

Sealants and adhesives are compatible with Multimodulus. Clearances recommended for expansion with calked or sealed joints is minimum 30.5 x 10-6 x (length of piece) x (biggest temperature range expected in C degrees) in mm. 3mm wide minimum recommended for penetration and expansion.

MAINTENANCE for Unpainted, factory-colored Multimodulus

Avoid prolonged exposure to strong chemicals such as acids, bases, and organic solvents. Spills should be cleaned up promptly. Refer to attached Table 2 for additional details regarding chemical exposures, clean up, and general maintenance.

LEGAL

This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experimentation. It is not intended however to substitute for any testing you may need to conduct to determine for yourself the suitability of our product for your purpose. This information may be subject to revision as new knowledge and experience becomes available, since we can not anticipate all variations in actual end-use of this information and product.

TABLE 1
Figures may be median result

Property	Typical Results	Test Method for Results
Density	114 pounds per cubic foot 1.826104 grams per cubic centimeter	DIN ISO 1183
Flexural Modulus	9300 MP	DIN EN ISO 178

Flexual Strength	65 MP	DIN EN ISO 178
Elongation	0.75%	DIN EN ISO 178
Compressive Strength	177 MP	EN ISO 604
Resistance to Impact	> 25 N (spring load)	DIN ISO 4586 T11
Resistance to Impact	> 120 cm (ball drop)	DIN ISO 4586 T12
Hardness of Surface	2-3 Mohs Index	DIN EN 101
Resistance to Surface Wear	68 (lost weight mm ² at 100 rev)	DIN ISO 4586 T6
Resistance to Immersion	0.03% by weight (boiling water)	DIN ISO 4586 T12
Dimensional Stability	< 0.16% length change 20C	DIN ISO 4586 T10
Dry Heat Resistance	4/5 slight change 180C	DIN ISO 4586 T8
Lightfastness	> 6 (Xenon arc) blue wool scale	DIN ISO 4586 T16
Toxicity of Emitted Gases	Class F0	NF F 16-101
Heat of Combustion	9.15 K J/g	NF EN ISO 1716
Reaction to Fire	Class M2	NF F 70 100
Fire Classification	Euroclass C – s1, d0 and	DIN EN 13501-1:200
Fire Behavior	Class B1	DIN 4102-01
Fire Tests	Class 1	BS 476 part 6 & 7
Electrostatic surface behavior	> 1 x 10 ¹²	DIN IEC 61 340-4-1

TABLE 2

The following reagents show no permanent effect of Multimodulus when left in contact for 16 hours.

Chemical residues can be removed with a wet scouring pad and bleaching cleanser.

Sometimes minimal effects have been observed, particularly those indicated by footnotes (*).

* may cause surface etching or deglossing after 16 hours

** may cause slight lightening after 16 hours

*** may cause slight darkening after 16 hours

Acetic acid (10%), Acetone**, Ammonia (10%), Amyl Acetate, Amyl Alcohol, Aromatic Ammonia, Ball Point Pen, Benzene**, Bleach (household type), Blood, Butyl Alcohol, Carbon Disulphide, Carbon Tetrachloride***, Citric Acid (10%), Caulk IRM (with or w/o ZnO), Cigarette (Nicotine), Coffee, Cooking Oils, Copalite Intermediary Varnish, Cotton Seed Oil, Crystal Violet, Cupra Ammonia, Dimethyl Formamide, Dishwashing Liquids, Ethyl Alcohol (Ethanol), Ethyl Acetate, Ethyl Ether, Formaldehyde (40%), Food coloring, Gasoline, Household Soaps, Hydrochloric Acid (20, 30%), Hydrogen Peroxide, Iodine (1% in alcohol)***, Kerosene, Ketchup, Lemon Juice, Lipstick, Liquid Shoe Polish, Lye (1%), "Lysol" Brand cleaner, Methanol**, Methyl Ethyl Ketone, Mineral Oil, Mustard, Nail Polish, Nail Polish Remover (Acetone), Naphtha, n-Hexane, Nitric Acid 6%, Olive Oil, Pencil Lead, Permanent Marker Ink, Peroxide, Picric Acid, Salt (Sodium Chloride), Shoe Polish, Silver Nitrate (10%), Soapless Detergents, Sodium Bisulphate, Sodium Hydroxide Solution (5, 10, 25, 40%**), Sodium Hydroxide Flake**, Sodium Hypochlorite (5%), Sodium Sulphate, Sugar (Sucrose), Sulphuric Acid (25, 33, 60%), Tannic Acid, Tea, Toluene***, Tomato Sauce, Trichloroethane, Trisodium Phosphate (30%), Urea (6%), Uric Acid, Urine, Vinegar, Washable Inks, Wine (all varieties), Xylene, Zinc Chloride.

Class II Reagents. The occasional stain that might result from inadvertent exposure to Class II reagents can often be removed. Scrubbing with household cleanser will remove light stains. More stubborn surface stains will require sanding with fine to coarse sandpaper: Acetic Acid (90, 98%), Acid Drain Cleaners, Cresol, Dioxane, Ethyl Acetate, Formic Acid (50, 90%), Glacial Acetic Acid,

Hydrofluoric Acid (48%), Methylene Chloride Based Products—Paint Removers, Brush Cleaners, some Metal Cleaners, Nitric Acid (25, 30, 70%), Phenol (40, 85%), Phosphoric Acid (75, 90%), Sulphuric Acid (77, 96%), Trichloroacetic Acid (10, 50%),

HAZARD IDENTIFICATION:

Multimodulus is not hazardous as shipped. However, operation such as sawing, routing, drilling and sanding can generate dust. High concentrations of dust can irritate eyes, nose, and respiratory passages and cause coughing and sneezing. Since no exposure limits are established for Multimodulus dust, US Enclosure recommends using common sense. Multimodulus does not outgas at room temperatures. At higher temperatures, small amounts of solvents may be released, the amounts of which are dependant upon temperature, time, and other variables. Individuals with preexisting diseases of the lungs or skin may have increased susceptibility to the effects of overexposure. Carcinogenicity Information: None of the components present in this material at concentrations equal or greater than 0.1% are listed by IARC, NTP, OSHA, or ACGIN as a carcinogen.

FIRST AID MEASURES:

First Aid

Inhalation: No specific intervention is indicated as the compound is not likely to be hazardous by inhalation. However if large amounts of dust are inhaled, or if exposed to fumes from overheating or combustion, remove to fresh air. Consult a physician if breathing is difficult or if the symptoms persist.

Skin Contact: Multimodulus is not likely to be hazardous by skin contact but cleansing the skin after use is advisable.

Eye Contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Ingestion: No specific intervention is indicated as Multimodulus is not likely to be hazardous by ingestion. Consult a physician if necessary.

FIRE FIGHTING MEASURES

Flammable Properties: Multimodulus can be combusted only with difficulty.

Hazardous gasses/vapors produced in a fire: carbon monoxide, methyl methacrylate, butyl acrylate and aldehydes.

Extinguishing Media: Water, Dry Chemical, CO₂, Foam.

Fire Fighting Instructions: Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel): NOTE: Review Fire Fighting Measures and Handling (Personnel) sections before proceeding with clean-up. Use appropriate Personnel Protective Equipment during clean-up. **Spill Clean-Up:** Recover undamaged material for reuse and damaged material for reclamation.

HANDLING AND STORAGE

Handling (Personnel): Avoid breathing dust. Avoid breathing trapped residue fumes from manufacturing outgassing. Machining operations such as sawing, sanding or routing create

friction and may result in temperatures high enough to release small amounts of fumes at the cutting tool surface.

EXPOSURE CONTROLS/PERSONNEL PROTECTION

Engineering Controls: Use ventilation that is adequate to keep employee exposure to airborne concentrations below recommended limits. Provide appropriate exhaust ventilation and dust collection at machinery.

Personal Protective Equipment: Eye/Face: Wear safety glasses during operations such as sawing, sanding, drilling or routing. Respirators: During grinding, sanding or sawing operations, if airborne particulate concentrations are expected to exceed permissible exposure limits, use a half face NIOSH approved air purifying respirator with type N100 filter. Respirators should be selected based on the form and concentration of the contaminant in air and in accordance with OSHA Respiratory Protection Standard CFR 1910.134.

Protective Clothing: Wear leather or cotton gloves when handling large pieces and during operations such as sawing, routing or drilling.

PHYSICAL AND CHEMICAL PROPERTIES

% Volatiles 0 % at room temperature.

Solubility in Water Insoluble

Form Shaped Articles

Specific Gravity 1.794068

STABILITY AND REACTIVITY

Chemical Stability Stable at room temperatures and storage conditions

Incompatibility with other materials None reasonably foreseeable

Decomposition Thermal decomposition can release methyl methacrylate and butyl acrylate

Polymerization Polymerization will not occur.

ECOLOGICAL INFORMATION

Ecotoxicological Information Aquatic- toxicity is expected to be low based on insolubility in water.

DISPOSAL CONSIDERATIONS

Waste Disposal Preferred options for disposal are (1) recycling, (2) incineration with energy recovery, and (3) landfill. Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

TRANSPORTATION INFORMATION

Shipping Information DOT Not Regulated

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