

MATERIAL SAFETY DATA SHEET

PRODUCT: RF-301 (laminate)

Developed by: ajk

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Initial Issue: November 30, 2010

Current Issue: November 30, 2010

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: RF-301 (laminate)

Address/Phone No. Taconic
 136 CoonBrook Road
 Petersburg, NY. 12138
 Phone number: USA – 518-658-3202
 Emergency phone number: USA – (CHEMTREC) 800-424-9300

Product Description: Laminate – for the electronics industry – constructed of PTFE coated woven glass fabric and copper sheeted laminations

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS number</u>	<u>Exposure Limits</u>	<u>% by Wt.</u>
Polytetrafluoroethylene (PTFE)	9002-84-0	N.A.	10 – 70
Glass Fiber**	65997-17-3	OSHA PEL – 15 mg/m ³ ACGIH TLV – 5 mg/m ³	5 – 28
Copper**	7440-50-8	OSHA PEL – 1mg/m ³ ACGIH TLV – 1mg/m ³	5 – 50
Titanium Dioxide	13463-67-7	OSHA PEL – 15 mg/m ³ ACGIH TLV – Ca*	1 - 10
Fused Silica**	7631-86-9	OSHA PEL – 20 mppcf	2 - 20

**Dust values shown

3. HAZARDS IDENTIFICATION

Emergency Overview

Clad laminate

Use of this product is not normally considered hazardous however latent material dust may cause eye or skin irritation. Further, if material is cut, sawed, sanded, etc., additional dust may be generated which includes copper particulate that may irritate the lungs. Elevated temperatures above 300-degrees C may cause evolution of particulate matter, which can cause “polymer fume fever”, a temporary condition. May cause eye irritation and respiratory irritation. Moving the individual to fresh air will alleviate the symptoms. Elevated temperatures above 400 degrees C will result in thermal decay of PTFE and may release carbonyl fluoride that hydrolyses to hydrogen fluoride and carbon dioxide in air by reacting with moisture. Avoid exposure; provide supplemental fresh air to individual exposed.

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Potential Health Effects:

EYE: Normally none however latent material dust may irritate eyes. Additionally, if the laminate is cut, sawed, sanded, additional dust may be created to irritate eyes. If material is heated above 300-degrees C, air emissions may cause temporary irritation (tears, blurred vision, and redness). Rinsing eyes with plenty of clean water will alleviate effects. See physician if problem persists.

SKIN: Normally none however latent material dust may irritate the skin. Additionally, if the laminate is cut, sawed, sanded, dust including copper dust may be generated to cause skin irritation. Wash skin with ample quantities of soap and water. Additionally, if product is heated above 300 degrees C, air emissions may cause skin irritation. Washing skin with ample quantities of soap and water will alleviate symptoms. See physician if problem persists.

INGESTION: Normally not a concern (since it is a sizable solid) and swallowing small amounts of this product is unlikely to cause harmful effects. See physician if problem persists.

INHALATION: Normally not a concern, however if the product is cut, sawed, etc., dust may be created that may include copper particulate constituents. Appropriate respiratory protection is warranted. Additionally, if the product is heated above 300 degrees C, it may create air emissions that cause temporary irritation to lungs. Breathing moderate amounts of semi-combusted material during thermal degradation may result in a loss of breathing comfort. Symptoms may include tightness of the chest, difficult breathing and coughing. Extended exposure may produce "polymer fume fever", a temporary condition. Moving the patient to fresh air will alleviate the symptoms. See physician if problem persists.

CHRONIC (CANCER) INFORMATION: Normally not a concern due to this product being very stable. Though tightly bonded within the delivered product, possibly small quantities of titanium dioxide are included within the mix of chemistry within the product.

TERATOLOGY (BIRTH DEFECT) INFORMATION: No known data available.

REPRODUCTIVE INFORMATION: No known data available.

POTENTIAL ENVIRONMENTAL EFFECTS: Generally, very stable. Minimal impacts due to the copper (if applied to the laminate) content of the product within an acidic wet/moist environment that may affect plants and animals. Copper fume emissions developed by high temperature incineration (without environmental controls) may also impact plants and animals.

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4. FIRST AID MEASURES

EYES: Immediately flush eyes with water for at least 15 minutes. If irritation continues, get medical attention

SKIN: Wash with plenty of soap and water. Get medical attention if irritation persists.

INGESTION: If swallowed, get medical attention.

INHALATION: Remove patient from exposure and remove to fresh air. If not breathing, give artificial respiration and/or supplemental oxygen. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: FLASHPOINT: >400 Degrees C

HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition of PTFE above 400-degrees C, can create Carbonyl fluoride, which with air and moisture, hydrolyses to Hydrogen Fluoride and Carbon Dioxide. Other PTFE degradation products include; perfluoroisobutylene, tetrafluoroethylene, hexafluoropropylene, carbon monoxide and trifluoromethane. Burning of the copper clad laminate can also create copper fumes.

EXTINGUISHING MEDIA: Use appropriate extinguishing media (e.g., water, dry chemical, CO₂).

FIRE FIGHTING INSTRUCTIONS: Use full bunker gear and respiratory protection.

6. ACCIDENTAL RELEASE MEASURES

Solid – collect with hands, broom, shovel and place in non-hazardous waste collection container for later disposal.

7. HANDLING AND STORAGE

PTFE laminated products present minimal hazards to people handling them in accordance to their operating and storage specifications. The primary health hazards associated with this product are: the generation of dust and inhalation of thermal decomposition products when product is subjected to temperatures greater than 300 degrees C due to accidental fire, unintended use or inappropriate disposal practices. Burning of the copper clad laminate can release copper fumes. Providing adequate exhaust ventilation at the places where the dust or emissions is formed will alleviate potential health issues.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Normally none are recommended. If however, cutting, sawing sanding, etc. of the product is necessary, a properly designed dust collection system is recommended at the source of cutting.

RESPIRATORY PROTECTION: Not required for normal use of the product. For emergency conditions where thermal decomposition of product is occurring, self-contained breathing apparatus is recommended. If working in a dusty environment, wear a NIOSH/MSHA approved dust respirator.

SKIN PROTECTION: Due to basic product handling processes, synthetic fiber or leather gloves are recommended to minimize cuts or abrasions due to handling the product.

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EYE PROTECTION: Due to basic product handling processes, protective eye wear (i.e., safety glasses) are recommended to minimize particulate entry or puncture to the eyes.

9. PHYSICAL AND CHEMICAL PROPERTIES.

Physical Form – Solid, laminate

Boiling Point – N/A

Density – approx. 2.2 grams per centimeter cubed

PH – N/A

Odour - None

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: Keep away from high temperature flames

INCOMPATIBILITY: Strong oxidants

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition of PTFE above 400-degrees C, can create carbonyl fluoride which with air and moisture, hydrolyses to Hydrogen Fluoride and Carbon Dioxide. Other PTFE degradation products are; perfluoroisobutylene, tetrafluoroethylene, hexafluoropropylene, carbon monoxide and trifluoromethane. Copper, within the laminate and subjected to high heat, can develop copper fumes.

11. TOXICOLOGICAL INFORMATION

No specific data available however dust may cause skin or eye irritation.

12. ECOLOGICAL INFORMATION

No specific data available however copper may cause localized flora and fauna stress.

13. DISPOSAL INFORMATION

Land-filling or incineration under approved, authorized controlled conditions is acceptable for disposal.

Disposal should be in accordance with local, state or national legislation.

14. TRANSPORT INFORMATION

No known restrictions

15. OTHER REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

TSCA: Individual chemistry listed on TSCA chemical Inventory

SARA Title III: Base material not listed

European Union: RoHS, WEEE and ELV compliant