



MATERIAL SAFETY DATA SHEET

GEON VINYL RESINS AND COMPOUNDS

Material Safety Data information for Geon vinyl resins and compounds are based on the U. S. Department of Labor Form OSHA-20 modified to facilitate description of our materials.

This Material Safety Data Sheet is applicable for all Geon vinyl resins and compounds.

SECTION IManufacturer's Name

BFGoodrich Company, Chemical Division

Emergency Telephone Number

(AC) 216/524- 0200

Address6100 Oak Tree Boulevard
Cleveland, OH 44131Trade Name

Geon

Chemical Name

Poly(vinyl chloride), PVC

Formula $(CH_2 CHCl)_n$ Chemical Family

Vinyl Chloride Polymer

Exceptions:

Copolymer of vinyl chloride/vinyl acetate: Geon 135, 130x24

Carboxy-modified vinyl chloride polymer: Geon 130x17

Copolymer of vinyl chloride and vinylidene chloride: Geon 100x122

SECTION II - PHYSICAL DATASpecific Gravity (H₂O - 1.0)Resin: 1.40
Compound: See Product
Data SheetSolubility in Water

Slight

Particle SizeResin: See Table II
Compound: Not applicab

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BFGoodrich
Chemical Division

The BFGoodrich Company, Chemical Division/6100 Oak Tree Blvd., Cleveland, Ohio 44131

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Appearance and Odor

Resin: White powder, practically odorless

Exception: The following Geon vinyl resins have a bland odor:

120x241	120x283	124F-1
120x251	121	126
120x276	124	

Compound: Cubical Granules or powder
Slight odor

SECTION III - REACTIVITY DATA

Stability
Stable

Decomposition Products
See Section VII

Hazardous Polymerization
Will not Occur

SECTION IV - HAZARDOUS INGREDIENTS

Vehicle and Catalyst
Not Applicable

Solvents

No organic solvents are used in the manufacture of Geon vinyl resins. Organic solvents may be used in the manufacture of stabilizers and other ingredients, and therefore, be detectable in small amounts in PVC compound. (See Section V, Ventilation)

Vapors

PVC resins and compounds may contain detectable quantities of residual vinyl chloride monomer, a cancer-suspect agent. See Section V.

Ubiquitous Chemicals

No polychlorinated biphenyls (PCB) or polybrominated biphenyls (PBB) are used in the manufacture of Geon resins or compounds. (See Note)

NOTE: These materials are ubiquitous and trace quantities may be found in the environment.

Heavy Metals

- A) Resin: No lead, mercury, other heavy metals or heavy metal compounds are used in the manufacture of Geon vinyl resins. (See Note)
- B) Compound: Geon vinyl compounds contain heavy metal stabilizers generally in amounts less than 5%. These may include organo-metallics such as tin, lead, cadmium, barium and zinc. (See Section V, Ventilation)

Plasticizer

Geon vinyl flexible compounds will contain polymeric, monomeric or mixed ester plasticizer in amounts between 20% - 50%. As these materials are volatile when heated, vapors can be released during processing. (See Section V, Ventilation)

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SECTION V - HEALTH HAZARD DATA

Threshold Limit Value

The Federal Register, Volume 39; Number 194; October 4, 1974; Section 1910.93q; Vinyl Chloride Part j (iv) states that OSHA regulations require all facilities where polyvinyl chloride (including alloys of PVC with other polymers), is processed or fabricated, be monitored to determine concentrations of vinyl chloride monomer (VCM). OSHA rules require that employees in such plants should not be exposed to VCM levels greater than 1.0 part per million (ppm) averaged over eight hours. The "action level" is 0.5 ppm. If required monitoring shows VCM to be below the action level, further tests are not necessary. REFER TO OSHA REGULATIONS FOR COMPLETE DETAILS.

As a precautionary measure, BFGoodrich recommends that periodic monitoring continue.

Extensive product and process improvements have resulted in Geon PVC resins with extremely low levels of residual VCM. Monitoring studies in PVC processing and fabricating plants using low VCM resin have shown all exposures to be below the action level. We believe that PVC processing and fabricating plants having good work practice and ventilation will be below the OSHA action level.

Residual VCM in major types of Geon vinyl resin are presented in Table I.

Vinyl Chloride Monomer

As PVC is manufactured today, small but detectable quantities of VCM remain in resins and compounds. While this may not result in detectable quantities in PVC processing and fabricating plants, there are conditions under which residual VCM may accumulate to measurable amounts. Since VCM is volatile, it is released from the resin gradually in storage and more rapidly under heat and further processing. Open, handle, and use PVC resin and compound under well-ventilated conditions to avoid significant employee exposure.

Areas where VCM might concentrate are:

1. Enclosed containers such as bulk railcars, bulk trucks, storage tanks, and drums. Vent the air space above the resin or compound and monitor for VCM or provide suitable protection prior to exposure of personnel.
2. Storage areas for bagged PVC and places where incoming resins and compounds are unloaded, where packages are first opened, and where material is first melted. Provide suitable ventilation.
3. Processing areas such as compound preparation, extruding, curing or coating operations, and other areas where heat is being applied. Provide suitable ventilation.

VCM at low levels cannot be detected by odor. Suitable test equipment and methods must be used.

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Respiratory Protection - Dust

Operations involving possible exposure to airborne PVC particles should be evaluated as the individual situation exists. If airborne concentrations of particles are found to exceed a total mass of 15 mg/m³ or if 5 mg/m³ of the total is respirable particles appropriate engineering controls or NIOSH approved respiratory protection is recommended. See OSHA 191.1000.

Ventilation

Exhaust ventilation designed to pull vapors away from workers should be installed at all mixing operations, the hot end and feed area of processing equipment and at cut-off equipment. We recommend environmental monitoring to determine the need for exhaust ventilation in other areas; and exhaust ventilation provided as needed. Other areas to consider include thermoforming, heat sealing, soldering or other operations involving heat.

SECTION VI - SPECIAL PROTECTION INFORMATION

Respiratory Protection

See Section V

Eye Protection

Safety glasses recommended

Ventilation

See Section V

Protective Gloves or Clothing

None

Certain ingredients you select for use in compounding may dictate the need for special consideration. We recommend you contact your additive supplier for necessary information regarding specific compounding ingredients.

SECTION VII - FIRE AND EXPLOSION HAZARD DATA

Extinguishing Media

Water

Special Fire Fighting Procedure

Self-contained breathing apparatus should be used for fires in which PVC becomes involved.

Decomposition Products

- A) When forced to burn, PVC combustion products will mainly be carbon monoxide, carbon dioxide, hydrogen chloride and smoke. Other gases, including aromatics and aliphatics, are present in small amounts.

NOTE 1: Geon 135 and 130x24 will also contribute minor amounts of acetic acid as gas and smoke.

NOTE 2: Hydrogen chloride is an irritant of the respiratory tract, eyes and skin at levels below those considered to be toxic.

NOTE 3: Phosgene and chlorine are not products of PVC combustion. VCM is not known to be a combustion product of PVC.

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- B) Under abnormal processing conditions, decomposition of PVC compound may occur in an extruder, injection molding machine, or other processing equipment, resulting in a characteristic whitish smoke which will contain hydrogen chloride and vapors from metallic stabilizers and other ingredients. Decomposing compound should be removed to a well-ventilated area and thoroughly soaked with water. Employees involved in removing decomposing materials should be provided with suitable self-contained breathing apparatus.

Medical Considerations

Treatment to exposure of PVC combustion or pyrolysis products should be symptomatic. Medical authorities should recognize that carbon monoxide and hydrogen chloride are generated.

Unusual Fire and Explosion Hazards

A) VCM, like most other organic materials, has a specific explosive limit, viz 3% to 23% by volume in air. In closed, heated vessels, such as intensive mixers, take precautionary measures to be sure explosion hazards are effectively eliminated.

B) PVC resins are not known to represent any potential dust explosion hazard. NFPA Fire Protection Handbook (14th Edition) states that ignition of fine particle size PVC resin is not obtained by the spark of a flame source; ignition occurs only by an intense heat source.

Ignition Characteristics

PVC resin has a flash-ignition temperature of about 391°C (735°F) and a self-ignition temperature of about 454°C (850°F). PVC polymer is characterized as an inherently flame retarded material because of chlorine in the molecule which makes it difficult to ignite and reduces flamespread. The presence of PVC resin or compound has not been associated, by itself, with creating a fire risk in handling, storage, or use. However, like all organic materials, PVC must be considered combustible and can be forced to burn by continuous application of intense heat. Like all combustible materials, protect from open flame and maintain proper clearance when using portable heat devices, etc.

NOTE: The descriptive term "flame-retarded" described a material response to heat and flame under controlled laboratory conditions and should not be considered or used for the description or appraisal of the fire hazard of this material or of products or systems fabricated from this material under actual fire conditions.

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SECTION VIII - SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled

Apply normal clean-up procedures. Waste PVC material should be stored in containers for re-use or disposal. If conditions occur where excessive dust is possible, employees should be supplied with respiratory protective devices. (See Section V)

Waste Disposal Method

Sanitary landfill or incineration in accordance with federal, state, or local regulations. If incineration is used, recognition should be made that hydrogen chloride is generated.

SECTION IX - SPECIAL PRECAUTIONS

Material safety data information is provided as an important guide to the safe use of PVC resin and compound. A Material Safety Data Sheet cannot be expected to cover all possible individual situations.

Since the user of PVC resin and compound has the responsibility for providing a safe and healthful operation, he has the obligation to thoroughly examine all aspects of his operation to determine if or where additional precautions are required.

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TABLE I

RESIDUAL VINYL CHLORIDE (RVCM) IN MAJOR TYPES OF PVC RESIN AND COMPOUND

DESCRIPTION	BFGCD DESIGNATION	I. V. ASTM-D-1243	CLOSEST CLASSIFICATION ASTM-D-1755	TYPE COMPOUND USED IN	AVERAGE AMOUNT OF RVCM (PPM) PRIME GOODS		AVERAGE AMOUNT OF RVCM (PPM) OFF-GRADE RESIN •
					IN RESIN PRIOR TO COMPOUNDING	IN COMPOUND	RVCM TAILINGS (B, C & E-GRADES)
<u>Suspension Resins</u>							
Homopolymers							
1. High Molecular Weight	102EP F-5	1.13	GP6-15443	Rigid	<5	<5	<50
2. Med. Molecular Weight	103EP	1.00	GP5-15443	Rigid &	<5	<5	<50
	103EP F-76	0.92	GP4-16043	Flexible	<5	<5	<50
	300x6	0.89	GP4-16043	Rigid	<100	<50	<100
	92	1.00	GP5-15543	Flexible	<5	<1	<5
3. Low Molecular Weight	110x334	0.68	GP1-16243	Rigid	<5	<5	<5
<u>Emulsion Resins</u>							
Dispersion	121, 128	1.20	Not Applicable		<20		<20
<u>Mass Resins</u>							
Low Molecular Weight	80x5	0.76	GP2-16243	Rigid	<15	<5	<50
	140x30	0.76	GP2-49243	None	<15	Not Applicable	<50
	140x31	0.84	GP3-49343	None	<15	Not Applicable	<50

*Downgraded resin (B & C gr)
Same as prime

JDT/mtm
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Note: < means "less than"

TABLE II

Particle Size: 100% through the following mesh screen.

<u>40 Mesh Screen</u>	<u>200 Mesh Screen</u>	<u>30 Mesh Screen</u>
80x5	120x241	92
80x6	120x251	99
80x24	120x271	
80x25	120x276	
80x26	120x279	
100x122	120x283	95% Through
102EP	121	<u>100 Mesh Screen</u>
103EP	124	101F4
103EPF76	124F1	106F2
110x334	126	
140x30	128	
140x31	128F1	
140x32	130x17	
300x6	130x24	
300x60	135	

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