2A-01

SECOR
International Incorporated

STORM WATER POLLUTION PREVENTION PLAN

Columbia Forest Products
100 Paul Road
Chatham, Virginia

SECOR PN: 015.08215.500

Submitted by:
SECOR International Incorporated

August 14, 2001

Prepared by:

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Reviewed by:

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4. A visual inspection of equipment needed to implement the plan, such as spill control and response equipment, will be conducted.

5. Based on the results of the inspection, the description of potential pollutants and preventive methods will be revised as appropriate within two weeks of the evaluation and implemented within 12 weeks of the evaluation.

6. A report summarizing the scope of the evaluation, personnel making the evaluation, the dates of the evaluation, major observations relating to the implementation of the SWPPP, and actions taken will be written. The report will identify any incidents of non-compliance. If there are no incidents of non-compliance identified, the report shall contain a certification that the facility is in compliance with the storm water permit. The report will signed by a duly authorized representative. The inspection report will be retained for at least three years.

4.5 REQUIREMENTS FOR DISCHARGES TO MUNICIPAL SEPARATE STORM WATER SYSTEMS

This facility does not discharge to a municipal separate storm sewer system that services a population of 100,000 or more.

4.6 ADDITIONAL REQUIREMENTS FOR FACILITIES SUBJECT TO EPCRA SECTION 313

The Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313 Special Requirements do not apply to this facility. The Chatham facility is not subject to the reporting requirements under EPCRA Section 313. The only EPCRA Section 313 chemicals used in significant quantities at the facility are formaldehyde and methanol. However, formaldehyde and methanol are not used at quantities that exceed the 10,000-pound threshold.

4.7 ADDITIONAL REQUIREMENTS FOR SALT STORAGE

There is no salt storage at the facility.

Table 7
Panel Gluing VOC Emissions - Emission Unit 4
Estimated Emissions for 1995
Columbia Forest Products, Chatham, VA Plywood Plant

Manufacturer[1]	Resin[1]	Ply	Annual Resin Usage (ton/yr)[1]	% Free Formaldehyde[2]	% Methanol[2]	% Total VOCs[2]	Formaldehyde Emissions (TPY)[3]	Methanol Emissions (TPY)[4]	Total VOC Emissions (TPY)[5]
North American	Resin LF595	Bending	3.16	0.15	0.34	0.64	0.005	0.011	0.020
		3-ply	144.64	0.15	0.34	0.64	0.22	0.49	0.93
		5-ply	125.92	0.15	0.34	0.64	0.19	0.43	0.81
		7-ply	84.742	0.15	0.34	0.64	0.13	0.29	0.54
Neste	Chembond 712	Bending	16.61	0.29	0.27	0.56	0.05	0.04	0.09
		3-ply	759.36	0.29	0.27	0.56	2.20	2.05	4.25
		5-ply	661.08	0.29	0.27	0.56	1.92	1.78	3.70
		7-ply	444.9	0.29	0.27	0.56	1.29	1.20	2.49
					Emission Unit 4, TOTAL:		5.99	6.29	12.81

Notes:

[1] Obtained from Columbia Forest Products, Virginia. 84% of all resin used was Chembond 712, the remaining 16% was Resin LF595.

[2] Obtained from North American and Neste Resins Corporation

[3] Formaldehyde Emissions = (Annual Resin Usage) X (% Free Formaldehyde)

[4] Methanol Emissions = (Annual Resin Usage) X (% Methanol)

[5] Total VOC Emissions = (Annual Resin Usage) X (% VOCs)

2A-03

6/17/96:
Revised 11/20/96

Twelve Month Totals
Annual Recordkeeping Calculated Monthly for Operating Permit
Columbia Forest Products, Chatham, VA - Registration No. 30120

	Month	22a Boiler Operation: Operating Time (hours)	22a Boiler Operation: Wood Fuel Burned (a) (tons)	22b Diesel for Hog (gals)	22c UV Coating: Panels Coated (number)	22c UV Coating: Surface Two Side(b) (Sq.Ft.)	22e Estimated UV VOCs (c) (lbs)	22e Estimated UV HAPs (d) (lbs)	22e UV Coating Purch'd (gals)	22d Resin Purchased (lbs)	22f Formaldehyde From Resin (lbs)	22f Methanol From Resin (lbs)	22f Total VOCs From Resin (lbs)
1	January 1998	552	236.9	751.6	32,334	2,069,376	296	0	575	538,600	539	1,002	2,618
2	February 1998	528	226.6	427.4	36,349	2,326,336	333	0	500	466,865	467	868	2,269
3	March 1998	552	236.9	468.1	39,515	2,528,960	362	0	677	512,860	513	954	2,492
4	April 1998	552	236.9	416.8	35,975	2,302,400	329	0	550	495,100	495	921	2,406
5	May 1998	552	236.9	853.8	38,499	2,463,936	352	0	450	538,320	538	1,001	2,616
6	June 1998	576	247.2	214.5	46,922	3,003,008	429	0	200	547,940	548	1,019	2,663
7	July 1998	480	206.0	529.2	47,206	3,021,184	432	0	450	500,520	501	931	2,433
8	August 1998	552	236.9	333.1	79,268	5,073,152	725	0	300	494,920	495	921	2,405
9	September 1998	696	298.7	132.2	72,380	4,632,320	662	0	1,150	549,960	550	1,023	2,673
10	October 1998	528	226.6	763.0	55,625	3,560,000	509	0	1,082	593,620	594	1,104	2,885
11	November 1998	480	206.0	810.8	37,807	2,419,648	346	0	550	323,440	323	602	1,572
12	December 1998	480	206.0	842.8	38,036	2,434,304	348	0	700	407,900	408	759	1,982
	Totals:	6,528	2,802	6,543	559,916	35,834,624	5,124	0	7,384	5,970,045	5,970	11,104	29,014
							Tons: 2.56				Tons: 2.99	Tons: 5.55	Tons: 14.51
	Permit Limits:			60,000 (gals/yr)		84,096,000 (Sq.Ft./yr)	6.0 (Tons/yr)				9.8 (Tons/yr)	9.8 (Tons/yr)	19.6 (Tons/yr)

(a) Wood fuel burned = (Operating hours) X (858.4 lbs fuel/hr)/2000; based on field study data at 80% firing rate (which is the normal maximum operating rate).
(b) Two sided surface area = (Number of panels) X (64 Sq.Ft./ Panel); assumes all panels are coated both sides, a conservatively high assumption.
(c) VOC estimate = (0.143 lbs VOC/MSq.Ft.) X (Surface) / (1000 Sq.Ft.); based on UV line permit application 84,096 MSq.Ft and 52,428 gals of highest VOC product (0.23 lb/gal).
(d) None of the UV coating products currently in use at the Chatham facility list HAPs in the product MSDS.

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2A-05

1999 Emission Calculations
Option II: Engineering Estimates or Material Balance Method
Press Emissions
Columbia Forest Products, Chatham, Virginia

Registration No. : 30120 **Point No. :** 022 **Segment No. :** 01 **SCC No. :** 30700707

Raw Material [1]				Raw Material Component [1]					Annual Resin Usage (lbs/yr)		Annual Emissions [a]	
Common Name	Product Name	Manufacturer	Density (lb/gal)	Name	Amount In Product		VOC (Y/N)	HAP (Y/N)			VOC (tons/yr)	HAP (tons/yr)
Resin	CR-595LF	Borden	10.51	Total VOC *	0.457	Wt%	Y	N	5,588,450	(2)	12.8	
				Formaldehyde	0.120	Wt%	Y	Y				3.4
				Methanol	0.190	Wt%	Y	Y				5.3
				Diethanolamine	0.001	Wt%	Y	Y				0.0
									Total:		12.8	8.7

* Includes Formaldehyde, Methanol, and Diethanolamine

Notes:
(a) Annual Emissions = [resin usage (lb/yr)] X [VOC amount in product (%)] / [2000 lb/ton] OR
Annual Emissions = [resin usage (lb/yr)] X [HAP amount in product (%)] / [2000 lb/ton]

References:
(1) Information provided by vendor, MSDSs and/or Certified Product Data Sheet (4/27/99).
(2) Chatham Record Keeping Spreadsheets.

2A-06

Date : 01/26/2001 02:54 PM

Comn
Departmen

Annual Upda

Registration#: 30120
Plant Name: Columbia Forest Products
Physical Location: Rt 1424/0.5 MI N Chatham - 100 Paul Rd SW
Mailing Address: PO Drawer F
Chatham, VA 24531

Entered 3-21-01 Rowland [illegible]

Summary Dat

Stk	Pt	Seg	Segment Description	SCC	Annual Thruput	Units	% Sulfur	% Ash	Heat Content (mmbtu/ SCC unit)
1	1	1	1 HOUSTON STANWOOD&CAMPLE	10300903	~~3402~~ 3687	Tons Burned	0	2	16
1	1	1	1 HOUSTON STANWOOD&CAMPLE	10300903	~~3402~~ 3687	Tons Burned	0	2	16
2	20	1	2 SAWING/SANDING PLYWOOD	30703002	2674	Tons of Woodwaste	0	0	0
3	21	1	UV ROLL COATER-VOC TON/YR	40202199	~~3.1~~ 1.5	Tons Solvent in Coating	0	0	0
3	21	2	UV LINE BAGHOUSE-Pnuemafill	30700799	3424	Tons Processed	0	0	0
22	22	1	PRESS EMISS TONS- VOC	49099999	~~12.77~~ 13.1	Tons Solvent Consumed	0	0	0
22	22	2	Press Emissions tons Formaldehyde	30112007	~~3.35~~ 3.4	Process Unit-Year	0	0	0
22	22	3	Press Emisison tons Methanol	40100301	~~5.3~~ 5.4	Tons Solvent Consumed	0	0	0
23	23	1	DIESEL ENGINE	20200101	~~5.17~~ 1.13	1000 Gallons Burned	.5	0	140

2A-07

ealth of Virginia
nvironmental Quality

alendar Year: 2000

DEQ SCRO
MAR 1 4 2001
LYNCHBURG

Region: LSO
County: 143 Pittsylvania
Plant ID: 00017
Contact Person: Bowen, George
Telephone: (804)432-2591
Employees: ~~98~~ 300
Principal Product: plywood
SIC: 2435

alendar Year: ~~1999~~ 2000

y /	Secondary Control Equip	% Overall Effic	% Annual Thruput Dec Feb	Mar May	Jun Aug	Sep Nov	Operating Schedule Hr Dy	Dy Wk	Hr Yr	% Space Heat	Stack Parameters Ht (ft)	Dia (ft)	Exit Temp (f)	Exit Vel (fps)	Plume Ht (ft)	Elevatic (ft)
		85	35	15	15	35	24	7	6400	30	40	2	400	16.75		~~560~~
Centrifugal Collector - Medium Efficiency																
			35	15	15	35	24	7	6400	30	40	2	400	16.75		~~560~~
			25	25	25	25	16	5	6400	0	32	5.59	76	15		~~560~~
Fabric Filter - Low Temperature i.e. T<180F																
			25	25	25	25	24	5	7000	0					30	
		99.9	25	25	25	25	24	5	7000	0	40	3.37	76	16.7	30	
Fabric Filter-Medium Temp i.e. 180F<T<250																
			25	25	25	25	24	7	6400	0					30	
			25	25	25	25	24	7	6400	0					30	
			25	25	25	25	24	7	6400	0					30	
			25	25	25	25	24	7	4000	0	6	.41	~~200~~ 940	~~340.64~~ 350		650

VOC Emissions Estimates
Facility Wide (FW), UV Coating (3), and Panel Gluing (4)
Backup Documentation

The VOC and HAP emissions for certain VOC and HAP containing materials were estimated using a material balance approach. These products include resins (used in glue mixes), putty, parts washing solvents, and a UV sealer. Emissions from the UV sealer are included in emission unit 3. Emissions from the resins used in the glue mixes are in emission unit 4, and the balance of the VOC and HAP emissions which are not associated with either the UV coating or panel gluing operations are included in the Facility Wide (FW) emissions unit. It was assumed that all of the VOCs and HAPs contained in these particular products used by the facility were emitted to the atmosphere as fugitive emissions.

Detailed spreadsheets were created using information supplied by Columbia Forest Products and its vendors. The information used to create the spreadsheets included 1995 material usage records, Material Safety Data Sheets (MSDSs), and written and verbal communication with product vendors and manufacturers. The spreadsheets list product name, manufacturer, chemical name, CAS number, and usage information. The weight percentage of non-exempt solvents multiplied by the usage data equals the VOC or HAP emissions.

Chemicals were listed in the spreadsheets as VOC if they met the Virginia definition of VOC which states that VOCs are those organic compounds which participate in atmospheric photochemical reactions, excluding methane, ethane, and many chlorinated, fluorinated, and chlorofluorinated hydrocarbons. It was assumed that solids and polymers (e.g., starches, clays, salts, etc.) used at this facility will not participate in photochemical reactions and therefore are not VOCs.

The federal list of 189 HAPs, as defined in Section 112(b) of the Clean Air Act and the DEQ priority hazardous air pollutants provided with the air permit application (revised March 15, 1995), were used in identifying the HAPs in the compounds used at the facility.

Facility Wide - Emission Unit FW

For the Facility Wide emissions unit, maximum operating scenario product usages are determined based on the ratio between resin max-op usage and the 1995 resin usage. The facility wide VOC and HAP emissions are presented in Tables 6, 6a, and 6b.

UV Coating - Emission Unit 3

The VOC and HAP emissions for the UV coating line are presented in Tables 6, 6a and 6b. The UV coating line, even when operated at the coating lines' full potential production, cannot coat all of the panels produced by the Chatham facility under the max-op scenario. Therefore, the

potential throughput for the UV line has been retained in this application with no changes from the previously permitted throughput. Although various UV cured coatings will be used, the coating with the highest VOC content was used in the calculations.

Panel Gluing - Emission Unit 4

The synthetic minor limitation for the Chatham facility is 9.80 tons/yr of methanol emissions from the resin used in panel gluing. With the North American resin currently utilized, which has a 0.34% methanol content, up to 2,882 tons per year of resin can be used before exceeding 9.80 tons per year of methanol emissions. In Table 7a, the max-op scenario estimate of formaldehyde emission was based on the percent of free formaldehyde in the Neste resin used in 1995. This choice was made for calculating the max-op scenario formaldehyde emissions to illustrate that various different resins may be used as long as the methanol emissions do not exceed the 9.80 tons/yr limitation.

Short-term maximum product usages are based on the maximum feed rate of plywood panels through the presses. The VOC and HAP emissions from resin usage are listed in Tables 7 and 7a.

The Plant Manager is responsible for:

- Oversight of the facility and plan implementation
- Reporting hazardous materials incidents to the proper authorities
- Establishing and implementing incident reporting procedures
- Developing training programs to implement the SWPPP

The Plant Engineer is responsible for:

- Identifying toxic and hazardous materials at the facility
- Identifying potential spill sources
- Developing and implementing inspection and records procedures
- Reviewing environmental incidents to determine whether upgrades to the SWPPP are necessary
- Reporting any significant change in plant chemistry to the plant manager
- Reviewing process changes and evaluating the impact on storm water and other environmental media
- Aiding in interdepartmental coordination in carrying out the SWPPP
- Reviewing new construction and updating the facility site map

The Maintenance Supervisor is responsible for:

- Identifying and reporting mechanical problems that may result in releases to storm water
- Performing inspections of and maintaining equipment that may impact storm water
- Maintaining on-site storm drains

4.2 POTENTIAL POLLUTANT SOURCES

The Chatham facility manufactures hardwood plywood. All manufacturing operations take place inside the facility building. Plywood is a building material that consists of veneers that are bonded to core materials with an adhesive. The facility purchases several different species of wood veneer, along with cores, such as fiberboard, lumber, and veneer (manufactured by others).

The wood materials, consisting of veneer outer layers that surround a core material, are brought to the glue spreader where adhesive is applied. The adhesive used in the lamination process is a resin and catalyst mixture. Resin used in the adhesive contains small quantities of formaldehyde and methanol. The catalyst used for the adhesive contains an ammonium salt. The resin and catalyst are fairly viscous substances. Resin, water, and the catalyst are mixed on a batch basis resulting in a glue mixture.

Once the veneers are assembled into plywood, the plywood panel is transferred to a cold press for five minutes, then to a hot press where the panel is heated to approximately 250°Fahrenheit. Hydraulic oil is used in the hot plywood presses. Used hydraulic oil is periodically transferred from beneath the hot press through an oil/water separator and temporarily stored in a 2,000-gallon holding tank until it is picked up by a used-oil recycling truck.

Sawdust and sanderdust are pneumatically transported to the fuel storage silo for use in the wood-fired boiler. Particulate emissions from the conveying of the wood waste are controlled by three baghouses. Excess wood waste and residuals are transported to an open trailer for sale off site.

A woodfiller, which contains a low concentration of acetone, is used on the sides and ends of the laminated panels. Additional acetone is added to the woodfiller as a thinning substance. Some of the panels are sent to the UV light-cured roll coating line to be sealed. The sealant contains low levels of esters and amines. A hog-fired boiler is used to supply steam to the presses for the plywood panels.

Kerosene and diesel fuels are stored in bulk tanks on the south side of the facility. Kerosene is used as fuel for small heaters around the facility, and diesel is used to fuel the tractor.

Potential pollutant sources include formaldehyde and methanol (found in the resin), ammonium salts (identified in the glue catalyst), wood particulate (from sawing operations), acetone (found in the woodfiller), diesel (used as fuel for the tractor and for the hog), kerosene (used as fuel for heaters), and oil (used to operate the hot press).

4.2.1 Site Drainage Plan

The Chatham facility is located in the Cherrystone Creek drainage basin, which joins Tanyard Branch approximately two miles southeast of Chatham, and eventually discharges into the Banister River. Based on the land surface topography and regional geology, anticipated local flow of shallow groundwater is generally toward the west to Cherrystone Creek. The facility topographical features are depicted in Figure 1.

The Chatham facility is surrounded by storm water drainage-ways, primarily on the west, north, and south sides of the facility. Surface water runoff from the property ultimately drains toward the west into Cherrystone Creek.

The plant site drainage plan includes paved, gravel, and grassy areas; the hardwood plywood storage building; the main production building; the finishing building; offices; the material loading/unloading area; a washwater collection area building; and access areas, as shown in Figure 2.

The site map in Figure 2 contains the following information:

- The location of the storm water discharges
- Flow direction arrows showing the flow pattern of surface runoff
- Paved areas and buildings within the drainage area
- Areas and facilities used for outdoor material storage and/or waste storage
- The location of loading areas
- Existing structures to control storm water runoff
- Impervious areas

4.2.2 Inventory of Exposed Materials

This section describes the inventory of materials handled, treated, or stored at the Chatham facility in a manner that allows exposure to storm water. The description includes the method and location of on-site storage and disposal practices, materials management practices to be employed to minimize the risk of contact of the material with storm water runoff, and the location of any structural and nonstructural control measures to reduce pollutants in the storm water.

Summary of VOC and Air Toxics Emissions
Resin Adhesive Spreader
Columbia Forest Products Chatham, Virginia Facility

Volatile Organic Compound (VOC) and toxic compound emissions were estimated for the new resin adhesive spreader at the Columbia Forest Products Chatham, Virginia facility. These emissions were assumed to be the result of evaporation of volatile chemical species from Casco-Resin CR-595LF used in the adhesive mixture applied by the spreader. This mixture is composed of 52.62% w/w resin, 19.74% w/w water, 1.32% w/w catalyst, and 26.32% w/w inert flour. The weight of the relatively insoluble flour was not included in any of the calculations related to aqueous solutes.

Specifically, the new equipment consists of a 108 inch Globe spreader. It is comprised of two pairs of cylindrical rollers, each 108-inches long. Each pair contains a doctor roller (8.9" in diameter) and an applicator roller (12" in diameter). One pair of rollers is situated above the wood panel passing through the device and one pair is situated below. Adhesive resin is piped into the crevice between the doctor and applicator rollers, such that a small pool of resin forms in between the rollers. This allows both rollers to become coated with the adhesive. It is the larger diameter applicator roller that contacts the wood panel and applies the adhesive. Air emissions from this device come primarily from the evaporation of volatile adhesive components from the coated surfaces of the doctor and applicator rollers.

According to the Certified Product Data Sheet (CPDS) supplied by Borden Chemical, Inc., the supplier of the 595LF resin, total volatiles content of the pure resin is 0.457% by weight. Weight percentages of formaldehyde (0.120%), methanol (0.190%), and diethanolamine (0.001%) are also available. These compounds are considered to be Toxic Pollutants for purposes of regulatory evaluation. The CPDS for the 595LF resin is provided in Attachment A

Maximum potential emissions of formaldehyde and methanol from the resin mixture used in the spreader were calculated based on equations for liquid- and gas-phase mass transfer coefficients. The equations and the kinetic and thermodynamic constants used in the calculations were taken from Chapter 4 Section 3 of the Environmental Protection Agency (EPA) AP-42 document. This section specifically refers to calculating emissions of volatile compounds from wastewater treatment impoundments, but the equations are general enough to apply to emissions from any aqueous solution. These "potential to emit" calculations are expected to be conservative since the liquid mass transfer rates should be lower in the resin mixture (relative to a pure dilute aqueous solution) due to the presence of suspended solids and thickening agents.

After calculation of the appropriate mass transfer coefficients for the resin mixture, total emissions were based on the surface area of the adhesive-coated rollers in the spreader. These calculations for formaldehyde and methanol are provided in Attachment B. Similar kinetic and thermodynamic data were not available for diethanolamine. However, since diethanolamine exhibits a boiling point much higher than formaldehyde (269 °C vs. -19.5 °C), and its concentration in the resin is approximately one hundredth that of formaldehyde, it was conservatively assumed that the emissions of diethanolamine were one percent of those calculated for formaldehyde.

Since the majority of the volatile compounds are accounted for as formaldehyde and methanol, total VOC emissions were estimated by multiplying the combined formaldehyde and methanol emissions by

2000 EMISSION CALCULATIONS
OPTION II: ENGINEERING ESTIMATE OR MATERIAL BALANCE METHOD

REGISTRATION #: 30120 POINT NO. 22 SEGMENT NO. 1 SCC NO. 49099999

Raw Material [1]				Raw Material Component [1]					Annual Resin Usage (lbs/yr)	Annual Emissions [a]	
Common Name	Product Name	Manufacturer	Density (lb/gal)	Name	Amount In Product		VOC (Y/N)	HAP (Y/N)		VOC (tons/yr)	HAP[2] (tons/yr)
Resin	CR-595LF	Borden	10.51	Total VOC *	0.457	Wt%	Y	N	5,724,300 [3]	13.1	
				Formaldehyde	0.120	Wt%	Y	Y			3.4
				Methanol	0.190	Wt%	Y	Y			5.4
									Total:	13.1	8.9

* Includes Formaldehyde, Methanol, and Diethanolamine

Notes:

(a) Annual Emissions = [resin usage (lb/yr)] X [VOC amount in product (%)] / [2000 lb/ton] OR
Annual Emissions = [resin usage (lb/yr)] X [HAP amount in product (%)] / [2000 lb/ton]

References:

(1) Information provided by vendor, MSDSs and/or Certified Product Data Sheet (4/27/99).
(2) HAP emissions are a subset of VOCs.
(3) Chatham Record Keeping Spreadsheets.

2A-14

HMIS (USA)		
Health Hazard	*	2
Fire Hazard		2
Reactivity		0

EQUISTAR
Material Safety Data Sheet
Glycol Ether EB

MSDS No.: 000000003396
Validation Date: 04/18/2001
Version No: 1.8

SECTION 1: IDENTIFICATION

Product Name: Glycol Ether EB

Chemical Name: 2-butoxyethanol

CAS Number: 111-76-2

Synonyms: ethylene glycol monobutyl ether; glycol butyl ether

Chemical Family: Glycol Ethers

Manufacturer: Equistar Chemicals, LP
One Houston Center, Suite 1600
1221 McKinney St.
P.O. Box 2583
Houston, Texas 77252-2583

Distributed By: ChemSolv, Inc.
1140 Industry Ave.
Roanoke, VA 24013
540-427-4000
Chemical Emergency:
Chemtrec: 800-424-9300

Telephone Numbers:
Emergency: CHEMTREC 800 424 9300
Product Safety: Lyondell/Equistar 800 245 4532

Phone 800 700 0946
Fax 713 951 1574

SECTION 2: COMPOSITION

Component Name:	CAS #:	OSHA PEL	OSHA STEL	ACGIH TLV	ACGIH STEL	Carcinogenic Listing*	Concentration by Wt./Mol% Avg.	Min.	Max.
Ethylene glycol monobutyl ether	111-76-2	50 PPM SKIN	N/L	20 PPM SKIN	N/L	N/L		99.0	99.9
Ethylene Glycol	107-21-1	N/L	N/L	N/L	100 MG/M3 CEILING AEROSOL	N/L			0.9
1-Butanol	71-36-3	100 PPM	N/L	20 PPM NIC SKIN	50 PPM CEILING SKIN	N/L			0.02

*1 = OSHA 2 = IARC 3 = NTP 4 = Others N/L = Not Listed See Section 11 for more information

SECTION 3: HAZARD IDENTIFICATION

Emergency Overview This material is HAZARDOUS by OSHA Hazard Communication definition.

Signal Word: WARNING!

Hazards: Inhalation of vapors may cause central nervous system depression. Eye irritant. Skin irritant.

Physical State: Liquid.

Color: Colorless.

Odor: Ether-like odor.

Potential Health Effects

Routes of Exposure: Skin Eye Inhalation

Signs and Symptoms of Acute Exposure: See component summary.

- *Ethylene glycol monobutyl ether* — May be irritating to the eyes, skin, and respiratory system. Exposure could cause central nervous system depression and liver and kidney damage.
- *Ethylene Glycol* — May be irritating to the eyes, skin, and respiratory system. May cause effects to the kidneys and central nervous system resulting in kidney failure and brain injury.
- *1-Butanol* — May be irritating to the eyes. Irritating to the respiratory system. May cause drowsiness and dizziness.

Skin: May cause slight irritation if left in contact with skin.

Inhalation: May produce symptoms of central nervous system depression including headache, dizziness, nausea, euphoria, loss of equilibrium, drowsiness, visual disturbances, fatigue, unconsciousness and respiratory arrest.

Eye: Eye contact may cause conjunctival irritation and slight transitory irritation of the cornea.

Ingestion: This material is low to moderately toxic. May cause headache, dizziness and gastrointestinal distress.

Chronic Health Effects: See component summary.

- *Ethylene glycol monobutyl ether* — May cause dermatitis by defatting the skin from prolonged or repeated contact. This substance may have effects on the haematopoietic system, resulting in blood disorders.
- *Ethylene Glycol* — Prolonged or repeated inhalation or ingestion may result in kidney and liver changes.
- *1-Butanol* — May cause dermatitis by defatting the skin from prolonged or repeated contact.

Conditions Aggravated by Exposure: Any pre-existing disorders or diseases of the nervous system, liver, respiratory system, skin, eyes, blood-forming organs, kidneys, and gastrointestinal system

SECTION 4: FIRST AID MEASURES

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 3 of this MSDS.

Inhalation: Move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. When breathing is difficult, properly trained personnel may assist the affected person by administering oxygen. Keep the affected person warm and at rest. Get medical attention immediately.

Eye: Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Skin: Immediately remove excess chemical and contaminated clothing; thoroughly wash contaminated skin with mild soap and water. If irritation persists after washing, seek medical attention. Thoroughly clean contaminated clothing before reuse; discard contaminated leather goods (gloves, shoes, belts, wallets, etc.).

Ingestion: If victim is conscious and able to swallow, have victim drink water to dilute. Never give anything by mouth if victim is unconscious or having convulsions. Induce vomiting only if advised by a physician or Poison Control Center. CALL A PHYSICIAN OR POISON CONTROL CENTER IMMMEDIATELY!

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SECTION 5: FIRE FIGHTING MEASURES

NFPA: Health 2; Fire 2; Reactivity 0; Others:

Flammability Classification: OSHA/NFPA Class IIIA Combustible Liquid.

Flash Point / Method: 66 °C (150 °F)
ASTM D-56 (Tag Closed Cup)

Auto-Ignition Temperature: 244 °C (472 °F)

Flammable Limits: LOWER: 1.1 vol%
UPPER: 10.6 vol%

Hazardous Combustion Products: Carbon oxides (CO, CO2)

Special Conditions to Avoid: Vapors can travel to a source of ignition and flash back.

Extinguishing Media: SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

Fire Fighting Instructions: Protective Equipment/Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will only provide limited protection.

INSTRUCTIONS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers form fire area if you can do it without risk. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw form area and let fire burn.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Release Response: Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material.

Reportable Quantities: See Section 15: Regulatory Information.

SECTION 7: HANDLING AND STORAGE

Handling: Containers, even those that have been emptied, will retain product residue and vapor and should be handled as if they were full. Do not eat, drink or smoke in areas where this material is used. After handling, always wash hands thoroughly with soap and water. Do not handle near heat, sparks, or flame. Avoid contact with incompatible agents. Use only with adequate ventilation/personal protection. Avoid contact with eyes, skin and clothing. Do not enter storage area unless adequately ventilated. Metal containers involved in the transfer of this material should be grounded and bonded.

Storage: Store containers in a cool, dry, ventilated, fire resistant area away from sources of ignition and incompatible materials.Keep container tightly closed and properly labeled.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne

levels below recommended exposure limits. Emergency shower and eyewash facility should be in close proximity (ANSI Z358.1)

Personal Protection:

Inhalation: A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use.

Skin: Wear chemical resistant gloves such as: Rubber
Use PPE that is chemical resistant to the product and prevents skin contact.

Eye: Wear safety glasses as minimum eye protection. Conditions may warrant the use of chemical goggles and possibly a face shield. Consult your standard operating procedure or safety professional for advice. Use protective eye and face devices that comply with ANSI Z87.1-1987.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	171 °C (340 °F)		**pH:**	No Data Available.
Vapor Pressure:	0.6 mm Hg	@ 20 °C	**Viscosity:**	No Data Available.
Specific Gravity:	Solid/Liquid:	0.902 (Water = 1)	**Water Solubility:**	Miscible
	Vapor:	4.1 (Air = 1.0)		
Octanol/Water Partition Coefficient In Kow:	0.83 Estimated.		**Melting/ Freezing Point:**	-70 °C (-94 °F)
			Evaporation Rate:	0.1 (butyl acetate = 1)

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability:	The product is stable.
Conditions to Avoid:	All sources of ignition.
Incompatibility with:	Oxidizers, Acids, Alkalis Lime, ammonia, organic amines, chlorates, chlorine, sodium hydroxide.
Hazardous Products of Decomposition:	Carbon Monoxide and Carbon dioxide.
Hazardous Polymerization:	Will not occur.
Reactions with Air and Water:	May form peroxides in the presence of air.

SECTION 11: TOXICOLOGICAL INFORMATION

Product Summary: See component summary.

Component Summary:

- *Ethylene glycol monobutyl ether*

LC50 (Inhl)
Rat 450 PPM/4H

LD50 (Oral)
Rat 470 MG/KG

ACUTE INHALATION EFFECTS: Short term exposure to high concentrations of vapors (300 - 600 ppm) can cause respiratory and eye irritation, CNS depression, and possible damage to kidney and liver.

ACUTE ORAL EFFECTS: The major toxic effect in acute and subchronic animal studies was intravascular red cell hemolysis (destruction). This was often associated with secondary effects such as spleen and liver enlargement and nephropathy. Studies show that hemolysis and secondary effects are not relevent to humans.

SKIN EFFECTS: This substance is a mild skin irritant.

EYE EFFECTS: This product is expected to be an eye irritant.

Repeated Dose Toxicity Administration of ethylene glycol butyl ether (EGBE) to rats (855 mg/kg/day) and mice (1000 mg/kg/day) for periods of 5-6 weeks showed no effects on the testes. NTP reported testicular weight changes in rats and mice ingesting up to 6000 ppm (443 and 894 mg/kg/day in rats and mice) of EGBE in a 13 week drinking water study. No chemically related microscopic lesions were seen.

- *Ethylene Glycol*

LC50 (Inhl)
Rat 10876 MG/KG

LD50 (Oral)
Rat 4700 MG/KG
Mouse 5500 MG/KG

SKIN EFFECTS: This substance is a mild skin irritant.

EYE EFFECTS: This product is expected to be a mild eye irritant.

Target Organ Effects CNS depressant. May cause liver and/or kidney damage.

Reproductive / Development Effects Ethylene glycol produces birth defects when orally administered to pregnant mice and rats at doses of 500 and 1000 mg/kg/day, respectively, during gestation. The no-effect levels for these effects were 150 and 500 mg/kg/day, respectively, in the mouse and rat. Minimal evidence for birth defects were detected in the offspring of mice exposed to aerosol concentrations up to 2500 mg/m3, 6hrs/day during gestation. Dermal exposure of pregnant mice to 3549 mg/kg/day during gestation produced no maternal toxicity and minimal if any birth defects. There is no current information to suggest that ethylene glycol produces birth defects in humans.

- *1-Butanol*

LC50 (Inhl)
Rat 8000 PPM

LD50 (Oral)
Rat 790 MG/KG

SKIN EFFECTS: moderate

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: This material is highly soluble in water. Laboratory toxicity tests indicate that is not significantly toxic to fish and aquatic invertebrates, although amphibians may be more sensitive. Wildlife species may be more susceptible since mammals and birds do not readily metabolize this material. The odor and flavor of this material may attract some wildlife and cause them to consume spilled material.

Environmental Fate: This material will biodegrade relatively rapidly in both soil and water, and will not persist in the environment. Due care should be taken to avoid accidental releases to aquatic or terrestrial systems.

Bioaccumulation: Because of this material's high solubility and rapid biodegradability, it is unlikely that bioaccumulation will occur in aquatic or terrestrial systems. Models estimate that this material will preferentially partition to water versus air or soil.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of all waste and contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations. Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. The materials resulting from clean-up operations may be hazardous wastes and therefore, subject to specific regulations.

SECTION 14: TRANSPORT INFORMATION

Proper Shipping Name: Combustible Liquid, n.o.s. (Ethylene Glycol Monobutyl Ether)

DOT Hazard Class: Combustible liquid.

UN/NA ID: NA1993

Marine Pollutant: No

Packing Group: PG III

NAER Guidebook: 128

Labels: None.

DOT Status: Regulated material. Not regulated in containers less than 119 gallons.

SECTION 15: REGULATORY INFORMATION

TSCA: All components of this product are listed or are exempt from listing on the TSCA 8(b) inventory. If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

TSCA 12(b) Component

SARA - Section 313 Emissions Reporting: This material contains the following chemicals with known CAS numbers subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

Component Summary:	Reporting Threshold
Ethylene Glycol Monobutyl Ether	1.0%
Ethylene glycol	1.0%
1-Butanol	1.0%

SARA - Section 311/312: Based upon available information, this material and/or components are classified as the following health and/or physical hazards according to Section 311 & 312:

Immediate (Acute) Health Hazard. Delayed (Chronic) Health Hazard. Fire Hazard.

CERCLA Hazardous Substances and their ReportableQuantities:

Component Summary:	Reportable Quantity
Ethylene glycol	5000 POUNDS (2270 KG)
1-Butanol	5000 POUNDS (2270 KG)

California Prop. 65:
Proposition 65 requires manufacturers or distributors of consumer products into the State of California to provide a warning statement if the product contains ingredients for which the State has found to cause cancer, birth defects or other reproductive harm. If this product contains an ingredient listed by the State of California to cause cancer or reproductive toxicity it will be listed below.

SECTION 16: OTHER INFORMATION

DISCLAIMER OF RESPONSIBILITY: The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness.

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Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Latest Revision(s): Revised Section(s): 4 5 6 15

END OF DOCUMENT

2A-21

CHEMSOLV, INC.

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FACSIMILE TRANSMITTAL SHEET

TO: Melissa

FROM: Shawn Kaeser

COMPANY: Columbia Forest

DATE: November 21, 2001

FAX NUMBER: 434-432-1598

TOTAL NO. OF PAGES INCLUDING COVER: 9

PHONE NUMBER: 434-432-2591 Ext. 2147

RE: Material Safety Data Sheet

COMMENTS:

Glycol Ether EB

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ACKNOWLEDGEMENT OF RECEIPT OF MATERIAL SAFETY DATA SHEET (S)

Please direct the MSDS(s) listed below to those in your company responsible for employee safety.

(Please sign and return.)

PRODUCT NAME

1) Glycol Ether EB
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____

Your signature below acknowledges receipt of the MSDS(s) listed above:

Signature: _____ Date: _____

Title: _____

Company: _____

Office Use

Customer Name: Columbia Forest
Date Sent: 11-21-01 Date Returned: _____
How Sent: With Delivery ___
Mail ___
Fax X