



Safety Data Sheet

Dewatered Kraft Lignin

Section 1. Identification

<u>Product:</u>	Dewatered Kraft Lignin
<u>Trade Name:</u>	BioChoice Lignin
<u>Other Means of identification:</u>	Not available
<u>Product Type:</u>	Solid
<u>Supplier Manufacturer:</u>	Domtar 395 de Maisonnaue Blvd. West Montreal, QC H3A 1L6 Canada
<u>Manufacturing Location :</u>	Plymouth, NC Tel (252)793-8111
<u>Emergency Telephone :</u>	CHEMTREC USA : 1-800-424-9300 International : 1-703-527-3887 (24/7) CANUTEC 1-613-996-6666 *666 (cellular) (24/7) DOMTAR 514-848-5888 Mon-Fri, 8am-5pm Eastern Time
<u>Recommended Use:</u>	Includes, but not limited to, research and development,, and manufactured products

Section 2. Hazards Identification

<u>Classification of the Substance or Mixture</u>	Skin Corrosion/ Irritation – Category 3 (Mild Irritation)
<u>Other Hazards which do Not result in classification</u>	May pose a combustible dust hazard if dried and suspended in air in proximity to ignition source

Section 3. Composition / Information on Ingredients

Substance / Mixture Mixture

Name	CAS #	Percent
Kraft Lignin	8068-05-01	60-100%
Sulfur	7704-34-9	0-3%

Synonyms: Kraft lignin powder, lignin, BioChoice lignin.

Section 4. First Aid Measures

Eye Contact: May cause irritation and redness. Immediately flush with running water. Treat powder in eyes as a foreign object.

Skin Contact: May cause mild skin irritation in some people. May cause an allergic reaction in some people. Wash contaminated skin with water. Seek medical attention if condition persists.

Inhalation: Avoid inhalation of dust. May cause obstruction in the nasal passages resulting in dryness of nose, dry cough, sneezing and/or headaches. Move to fresh air. Seek medical help if condition persists, or if severe coughing or breathing difficulties occur.

Ingestion: If irritation occurs rinse mouth out with water. Seek medical attention if condition persists.

Section 5. Fire Fighting Measures

Suitable Extinguishing Media: Water and Dry Chemical

Unsuitable Extinguishing Media: None known.

Special Firefighting Procedures: Avoid dispersing dust. Use water to wet dust to reduce likelihood of ignition. Remove burned or wet dust to open area after fire is extinguished.

Specific Hazards: Risk of dust explosion in dust-raising operations. Decomposition products may include sulfur oxides and/or carbon oxides.

Caution: Kraft lignin dust may be explosive under certain conditions. Caution should be taken in the processing, shipping, handling and use of kraft lignin. Dry powder or residues should not be allowed to accumulate and dust should be kept away from ignition sources. Risk is reduced if the material is kept moist.

Section 6. Accidental Release Measures

Sweep or vacuum spills for recovery or disposal. Provide adequate ventilation. Avoid creating dusty conditions and sources of ignition as lignin dust may pose a combustible dust hazard.

Section 7. Handling and Storage

Avoid eye contact, prolonged contact with skin, and prolonged breathing of dust. Eating, drinking and smoking should be prohibited in areas where material is handled. Workers should wash hands and face before eating, drinking, smoking or using the lavatory after handling. Avoid accumulation of dust. Use NIOSH-approved filtering face piece (dust mask) and goggles when ventilation is not possible.

Keep away from direct heat and ignition sources. Dried lignin dust may pose a combustible dust hazard.

Section 8. Exposure Controls / Personal Safety

Personal Protective Equipment

Respiratory: Use NIOSH approved filtering face piece (dust mask) if ventilation is not possible.

Eye Protection: Tight fitting chemical goggles are recommended.

Protective Gloves: Nitrile or other protective chemical gloves are recommended.

Other Protective Clothing or Equipment: If extremely dusty use chemical protective clothing.

Ventilation: Adequate exhaust or natural ventilation should be provided to keep airborne concentrations of lignin dust to an acceptable level. Dust control ventilation should be used where potential explosive concentrations and ignition sources are present. The design and operation of ventilation systems should address the possibility of explosive concentrations within the system. Ventilation systems should utilize explosion relief vents or suppression systems if conditions justify their use.

Section 9. Physical and Chemical Properties

Appearance: Brown fine powder

Odor: Vanilla, weak
Odor Threshold: Not available
pH: 2 to 7
Melting Point: Not available
Freezing Point: Not available
Initial Boiling Point: Not available
Boiling Range: Not available
Flash Point: Closed cup. Not ignitable.
Evaporation Rate: Not available
Flammability: Not available
Upper/Lower Flammability or Explosive Limits: Not available
Vapor Pressure: Not available
Vapor Density: Not available
Relative Density: Bulk density at 60% dry solids content is 348 kg/m³
Solubility: Not soluble under acidic and neutral conditions. Soluble under alkaline conditions. Soluble in DMSO. Partly soluble in acetone and methanol.
Partition Coefficient: Not available

Auto-ignition Temperature:

Explosive Severity- 20L Sphere

Maximum Explosion Pressure (bar)	7.6
Maximum rate of Pressure Rise (bar/s)	684
Kst Value (bar.m/s)	186
a. Minimum Ignition Energy- Dust Cloud (mJ)	500-1000
b. Minimum Ignition Temperature- Dust Cloud (C)	470-480
a. Limiting Oxygen Concentration (% by volume)	***
b. Minimum Explosible Concentration (g/m ³)	70-80

*** Indicates test was not performed on the sample

Decomposition Temperature: Not available

Viscosity: Not available

Section 10. Stability and Reactivity

Reactivity: No specific test data related to reactivity available for this product or its ingredients.

Chemical Stability: The product is stable.

Possibility of

Hazardous Reactions: Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to Avoid: Dust raising conditions, static electricity conditions.

Incompatible

Materials: Reactive or incompatible with the following materials: oxidizing materials, reducing materials, drying oils and organic materials.

Hazardous Decomposition

Products: Thermal decomposition of Kraft Lignin produces irritating and toxic fumes and gases including acrid smoke, carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂, etc.), sulfur oxides (SO₂, SO₃, etc.), aldehydes and organic acids. Natural decomposition of organic materials such as wood may produce toxic gases and an oxygen deficient atmosphere in enclosed or poorly ventilated areas.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity: No data available

Irritation/Corrosion

Skin: No data available

Eyes: No data available

Respiratory: No data available

Sensitization

Skin: Skin sensitization may occur

Respiratory: No data available

Mutagenicity: No data available

Carcinogenicity: No data available

Reproductive Toxicity: No data available

Teratogenicity: No data available

Specific Target Organ toxicity

Single Exposure: No data available

Repeated Exposure: No data available

Aspiration Hazard: No data available

Routes of Exposure: Dermal, Oral, Inhalation, Eye

Symptoms related to the physical, chemical and toxicological characteristics

Eye Contact: Pain or irritation, watering, redness.

Inhalation: No known significant or critical hazards.

Skin Contact: Irritation, redness.

Ingestion: No known significant or critical hazards.

Delayed and immediate effects and chronic effects from short and long term exposure

Short Term Exposure: Potential Effects

Immediate: No known significant or critical hazards.

Delayed: No known significant or critical hazards.

Long Term Exposure: Potential Effects

Immediate: No known significant or critical hazards.

Delayed: No known significant or critical hazards.

Potential Chronic Health Effects

General: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity: No known significant or critical hazards.

Mutagenicity: No known significant or critical hazards.

Teratogenicity: No known significant or critical hazards.

Developmental

Effects: No known significant or critical hazards.

Fertility Effects: No known significant or critical hazards.

Numerical Measures of Toxicity

Acute Toxicity Estimates: No data available.

Section 12. Ecological Information

Toxicity

Product/Ingredient Name	Result	Species	Exposure
Sulfur	Acute EC > 5000 ppm Fresh Water	Daphnia- Daphnia magna- <24 hrs	48 hours
	Acute LC50 >180 ppm Fresh Water	Fish- Lepomis macrochirus- Juvenile (Fledgling, Hatchling, Weanling)	96 hours

Persistence and Degradability

Product/Ingredient Name	Test	Result	Dose	Inoculum
Dewatered Lignin	BOD	11,600 mg/l	-	-
	COD	19,600 mg/l	-	-

Bioaccumulative Potential: No data available.

Mobility in Soil
Soil/water partition coefficient (Koc): No data available.

Other Adverse Effects: No data available

Section 13. Disposal Considerations

Disposal Methods: Significant quantities of waste product residues should not be disposed of in process sewers or wastewater treatment facilities. Dispose of surplus and non-recyclable products in approved landfills or via a licensed waste disposal contractor. Unused product is not a RCRA hazardous waste. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Note that lignin dust may pose a combustible dust hazard.

Section 14. Transport Information

Not regulated as a hazardous material by the US DOT, IMDG or IATA. No environmental hazards. No special precautions for user.

Section 15. Regulatory Information

No known specific national and/or regional regulations applicable to this product (including its ingredients).

US Federal Regulations:

TSCA 8(a) IUR Exempt/Partial Exemption: Not determined

United States Inventory (TSCA 8b): All components listed or exempted.

SARA 302/304 emergency planning and notification: No products found.

SARA 302/304/311/312 hazardous chemicals: Sulfur

SARA 311/312 MSDS distribution- chemical inventory- Hazardous identification:

Sulfur: Fire hazard, immediate (acute) health hazard, delayed (chronic) health hazard.

Not listed in any of the following:

- Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)
- Clean Air Act Section 602 Class I Substances
- Clean Air Act Section 602 Class II Substances
- DEA List I Chemicals (Precursor Chemicals)
- DEA List II Chemicals (Essential Chemicals)

State Regulations:

- Massachusetts:** The following components are listed: Sulfur.
- New York:** None of the components are listed.
- New Jersey:** The following components are listed: Sulfur
- Pennsylvania:** The following components are listed: Sulfur
- California Prop 65:** No products were found.

Section 16. Other Information

HMIS Rating (Scale 0-4): Health: 2 Fire: 2 Physical hazards: 1
NFPA Rating (Scale 0-4): Health: 1 Fire: 2 Reactivity: 0

History

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Notice to the reader:

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

