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MATERIAL SAFETY DATA SHEET

Section 1 – IDENTIFICATION OF SUBSTANCE / PREPARATION AND COMPANY

For Product Information: Dyadic International (USA), Inc. (561) 743-8333
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For Emergencies: CHEMTREC (800) 424-9300 US, (703) 527-3887 (collect) International

Product Name: FIBREZYME® LBR
Product Code: #922
Product Use: Pulp and Paper Processing Aid

Section 2 – HAZARDS IDENTIFICATION

This substance is classified as dangerous according to Directive 1999/45/EC and its amendments.

Hazards Description: Repeated inhalation of enzyme powder or liquid may cause sensitization and may cause allergic type reaction in sensitized individuals. Prolonged skin contact may cause irritation.

ACUTE HEALTH EFFECTS OF OVEREXPOSURE:

Swallowing: Ingestion of this material is not known to result in significant adverse health effects.
Skin Absorption: Not applicable.
Inhalation: Mist or spray may cause allergic skin reactions in susceptible individuals. Avoid breathing fumes.
Skin Contact: This material is not known to be a skin irritant, but it is recommended that prolonged contact with the skin be avoided.
Eye Contact: May cause irritation.
Chronic Overexposure: Repeated inhalation can result in sensitization and allergic response in hypersensitive individuals.
Other Health Hazards: In the case where overexposure may exist, the use of NIOSH-MSHA dust and mist respirator may be advised.

Section 3 – COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical</u>	<u>CAS#</u>	<u>Hazard (Y/N)</u>	<u>Concentration %</u>
Cellulase	9012-54-8	Y	5
Water/Inerts:	Confidential	N	Remainder

Date Created: March 4, 2009
Revision Level: 5
Product: Liquid

Substance / Preparation: Substance (UVCB)
Chemical Family: Cellulase
Chemical Family Name: Carbohydrase Enzyme
Formula: Proprietary
Hazard Classification: Xn (Harmful). Irritant. Sensitizing.
Exposure Limit: None
R Number / S Number: R42 / S23*
CAS Number: 9012-54-8
CAS Name: Cellulase
EINECS / ELINCS Number: 232-734-4
IUB Number: 3.2.1.4

* See Section 15 for full text of R and S Phrases noted above.

Section 4 – FIRST AID MEASURES

Swallowing: Give large quantities of water. If unconscious or in convulsion, take immediately to hospital or physician.
Inhalation: Remove from contaminated area to fresh air. Seek medical attention if allergic response exhibited.
Skin Contact: Wash skin with soap and water. Remove contaminated clothes and wash.
Eye Contact: Flush eyes with low pressure water for at least 15 minutes. Do not attempt to neutralize chemically. Seek medical attention immediately if irritation persists.

Section 5 – FIRE FIGHTING MEASURES

Flash Point: Not applicable
Flammability limits (vol/vol%): Lower: No data Upper : No data
Extinguishing Media: Carbon dioxide, foam and/or ABC dry powder.
Non-suitable Media: None
Special Fire Fighting Procedures: Firefighters should wear NIOSH/MSHA –approved self-contained breathing apparatus and full protective clothing. Cool containers exposed to fire with water.
Unusual Fire and Explosion Hazards: None known
Hazardous Decomposition Materials
Under Fire Conditions: Oxides of carbon, oxides of nitrogen

Section 6 – ACCIDENTAL RELEASE MEASURES

**SPILLED MATERIAL SHOULD BE REMOVED IMMEDIATELY
TO AVOID THE FORMATION OF AEROSOLS.**

Personal
Precautions: Contact emergency personnel and keep unnecessary personnel away.
Use suitable protective equipment (Section 8).

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Method: Removal by mechanical means (i.e. vacuuming with HEPA filters) is preferred. Solid may be placed into approved containers for disposal. Dilute remainder with plenty of water avoiding the formation of aerosols and flush to an approved drain. Provide sufficient ventilation and wash or dispose of contaminated clothing.

Disposal: Contaminated material is to be disposed of in accordance with State, local and Federal Regulations. Compliance includes, but it not restricted to, the Clean Water Act, the Clean Air Act and the Resource Conservation And Recovery Act.

Section 7 – HANDLING AND STORAGE

Maximum Storage Temperatures: None

Handling and Storage: Keep from freezing. Protect against physical damage. Store in a cool, dry area in closed containers. Segregate from acids, peroxides and all combustible organic or easily oxidizable materials. Keep away from heat and flame. Avoid accidental discharge into sewers and natural waters. Empty container retains vapor and product residue. Observe all labeled safeguards until cleaned, reconditioned or destroyed.

Packaging Materials: Use original container

Section 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limit: Cellulase; not known

Ventilation: Efficient exhaust ventilation should always be provided to draw fumes and vapors away from workers to prevent routine inhalation. Ventilation should be adequate to maintain the ambient workplace atmosphere below the TLV of any items identified under the hazardous components section.

Respiratory Protection: Normal. Wear a NIOSH/MSHA approved respirator whenever exposure to fumes or vapors exceeds the TLV of any items identified under hazardous components section. (EN 143)

Protective Gloves: Impervious gloves, such as Neoprene or polyvinyl alcohol, should be worn when handling chemicals. (EN 374)

Eye Protection: Goggles / Safety Glasses / Mono-goggles. (EN 166)

Other Protective Equipment: Long Sleeve shirt / Rubber apron / Safety shoes

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance & Odor: Medium to dark amber liquid; slight fermentation odor.

Density: 1.15 - 1.25

Boiling Point: Does Not Apply

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Flash Point:	Does Not Apply
Pour Point:	Not Recorded
Solubility:	Soluble
Water Solubility:	Completely miscible
Vapor Pressure:	Does Not Apply
Vapor Density:	Does Not Apply
Evaporation Rate:	Does Not Apply
Water = 1	
pH:	4.5 ± 1.0
TLV(ppm):	Does Not Apply
Flammability:	Not Checked
Explosive Properties:	Not Available
Oxidizing Properties:	Not Available

Section 10 – STABILITY AND REACTIVITY

Stability:	Stable
Conditions to Avoid:	None
Materials to Avoid:	None known
Hazardous Combustion or Decomposition Products:	None
Hazardous Polymerization:	Does not occur
Conditions to Avoid:	None known

Section 11 – TOXICOLOGICAL INFORMATION

Potential acute health effects

Skin contact:	Not available
Eye contact:	Not available
Sensitization:	Not available

Acute toxicity

Oral toxicity (rats) LD ₅₀ :	>17 g/kg bw (by calculation)
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Potential chronic health effects

Sensitization:	Yes (inhalation)
Carcinogenicity:	Not available
Mutagenicity:	Not available
Developmental and teratogenic Effects:	Not available
Reproductive toxicity:	Not available

Chronic toxicity: This product does not contain any substances that are considered by OSHA, NTP, IARC or ACGIH to be “probable” or “suspected” human carcinogens. No additional test data found for product.

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Over-exposure signs/symptoms

Inhalation:	Over exposure by inhalation may cause sensitization and allergic response in hypersensitive individuals.
Ingestion:	Ingestion of this material is not known to result in significant adverse health effects.
Skin contact:	This material is not known to be a skin irritant, but it is recommended that prolonged contact with the skin be avoided.
Eye contact:	Overexposure of the eye is characterized by irritation.
Target organs:	Not available
Other adverse effects:	Not available

Section 12 – ECOLOGICAL INFORMATION

Ecotoxicity Data:	No data available
Mobility:	No data available
Persistence and Degradability:	No data available
Bioaccumulative Potential:	No data available

Section 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method:	Chemical additions, processing or otherwise altering this material may make waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from Federal laws and regulations. Consult any regional local authority requirements regarding the proper disposal of this material.
Hazardous Waste:	To present knowledge of the supplier, this product is not regarded as hazardous waste as defined by EU Directive 91/689/EC.
Container Handling And Disposal:	Rinse containers before disposal.

Section 14 – TRANSPORTATION

DOT ID Number:	None assigned
DOT Hazard Class:	None assigned
DOT Shipping Name:	None assigned
DOT Precautionary Label:	None required
Packing Group:	None assigned
Emergency Guide Number:	Not regulated
IMO/IATA ID Number:	None assigned
IMO/IATA Hazard Class:	None assigned
IMO Shipping Name:	None assigned
IATA Shipping Name:	None assigned
IMO/IATA Precautionary Label:	None required
IMO/IATA Packing Group:	None assigned
Marine Pollutant:	No
UN Number:	None assigned

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Section 15 – REGULATORY INFORMATION

Product Use: Classification and labeling have been performed according to EU directives 67/548/EEC, 1999/45/EC, including amendments and the intended use – pulp and paper processing aid.

EU Regulations:

Risk Phrases: R42 - May cause sensitization by inhalation.

Safety Phrases: S23 - Do not breathe vapor or spray.

Harmful. Repeated inhalation of enzyme aerosol may cause sensitization and will cause allergic type reactions in sensitized individuals. Prolonged skin contact may cause irritation. Do not breathe spray.



Labeling: Xn

OSHA permissible exposure limits: None established

TWA: None established

STEL: None established

Section 16 – OTHER INFORMATION

National Paint and Coatings Hazardous Materials Identification System (“HMIS”) Hazard Ratings:

Health:	1
Flammability:	0
Reactivity:	0
Personal Protection:	B

Disclaimer: The information and recommendations in this data sheet are believed to be correct and reliable. However, the data offered for consideration and verification by the user and Dyadic International, Inc. offers no guarantee, warranty or representation as to the accuracy or completeness of the data.

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