



DYADIC INTERNATIONAL (USA), INC.  
140 INTRACOASTAL POINTE DRIVE, SUITE 404  
JUPITER, FLORIDA 33477  
(561) 743-8333 tel.  
(561) 743-8343 fax  
<http://www.dyadic.com>

## MATERIAL SAFETY DATA SHEET

### Section 1 – IDENTIFICATION OF SUBSTANCE / PREPARATION AND COMPANY

---

**For Product Information:** Dyadic International (USA), Inc. (561) 743-8333  
140 Intracoastal Pointe Drive, Suite 404  
Jupiter, Florida 33477  
Richard Jundzil [rjundzil@dyadic.com](mailto:rjundzil@dyadic.com)

**For Emergencies:** CHEMTREC (800) 424-9300 US, (703) 527-3887 (collect) International

Product Name: DYADIC® CELLULASE PLUS  
Product Code: #407  
Product Use: Food, Animal Feed and Brewing 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	15
Water/Inerts:	Confidential	N	Remainder

Date Created: February 20, 2009  
Revision Level: 0  
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).

Date Created: February 20, 2009

Revision Level: 0

Product: Liquid

Dyadic® Cellulase PLUS 2 of 6

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

**Date Created: February 20, 2009**  
**Revision Level: 0**  
**Product: Liquid**

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:	4.8 ± 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 <sub>50</sub> :	>20 g/kg bw (by calculation)
<i>Daphnia magna</i> LC <sub>50</sub> and EC <sub>50</sub> :	<925* mg/L
Fathead minnow LC <sub>50</sub> and EC <sub>50</sub> :	<130* mg/L
Algae ( <i>P. subcapita</i> ) EC <sub>50</sub> and NOEC:	>10,000* mg/L

\*Actual analysis performed on same fermentation at higher concentration.

### Potential chronic health effects

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

Date Created: February 20, 2009

Revision Level: 0

Product: Liquid

Dyadic® Cellulase PLUS 4 of 6

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.

### **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

**Date Created: February 20, 2009**

**Revision Level: 0**

**Product: Liquid**

**Dyadic® Cellulase PLUS 5 of 6**

Label: None required  
IMO/IATA Packing Group: None assigned  
Marine Pollutant: No  
UN Number: None assigned

## 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 – food, animal feed and brewing 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.

Date Created: February 20, 2009

Revision Level: 0

Product: Liquid

Dyadic® Cellulase PLUS 6 of 6