



ECO-INNOVATION
WHEN BUSINESS MEETS THE ENVIRONMENT

**CIP Eco-innovation
Pilot and market replication projects
Call 2008**

Call Identifier: CIP-EIP-Eco-Innovation-2008

**Deliverable Report D.4.5.
Material Safety Data Sheet
for the PROTECTOR product
PROTECTOR
Contract ECO/08/238984/SI2.532247**

**Reporting Date
11/07/2011**

Project coordinator: Edward Someus / Terra Humana Ltd.

Project website: <http://www.3ragrocarbon.com/protector>



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INTRODUCTION

The following separated Material Safety Data Sheets have been prepared:

- Two PROTECTOR Material Safety Data Sheets: one for fungal product (containing *Trichoderma harzianum* strain) and separately for the bacterial product.
- A separated MSDS for the pure animal bone charcoal carrier (ABC) which is free from any microbiological substance.

The provision of a Safety Data Sheet (also called a Material Safety Data Sheet or MSDS) is a mandatory requirement for substances and preparations which are classified as "dangerous" according to the Dangerous Substances Directive (67/548/EEC) and the Dangerous Preparations Directive (99/45/EC). An MSDS is also mandatory for preparations which are not classified as dangerous but contain at least one substance at a level of >1% posing a health or environmental hazard, that is, a substance classified as dangerous, or a substance which has workplace exposure limits. The MSDS must be provided to the recipient by the person responsible for placing the substance or preparation on the market (the manufacturer, importer or distributor). An MSDS is principally intended for use by professional users.

The ABC and PROTECTOR MSDSs provide information on the hazards to health, safety and the environment inherent in a chemical substance or preparation. It also gives guidance on how the substance or preparation should be handled, stored and disposed of as well as what to do in case of an accident.

The PROTECTOR and ABC Material Safety Data Sheets have been prepared on the basis of the Regulation EC No. 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH regulation) and the European Directive on Safety Data Sheets (2001/58/EC).

The information provided by the PROTECTOR and ABC MSDSs also meets the requirements set out in Directive 98/24/EC on the protection of the health and safety of workers.

The European Directive on Safety Data Sheets (2001/58/EC) entered into force on July 30, 2002. The Annex of the Directive provides in-depth guidance on the compilation of an MSDS and aims to ensure consistency and accuracy in the content of each of the mandatory 16 sections under the following headings:

- identification of the substance/preparation and of the company/undertaking
- composition/information on ingredients
- hazard identification
- first-aid measures
- fire-fighting measures
- accidental release measures
- handling and storage
- exposure controls/personal protection
- physical and chemical properties
- stability and reactivity
- toxicological information
- ecological information
- disposal considerations
- regulatory information
- other information The Authorities in the European Member States monitor the availability of Material Safety Data Sheets in the trade.

ANIMAL BONE CHARCOAL (ABC) MATERIAL SAFETY DATA SHEET

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

1. Identification of substance**1.1. Identification of the substance or preparation**Product name/Trade name: Charcoal, Animal, Granulated

Synonym: Bone black, bone charcoal

1.2. Use of the substance/preparation**1.3. Manufacturer/Supplier**

Manufacturer's name: Terra Humana Ltd.

Address (Number, Street, City, Code): H-1222 Budapest, Széchenyi 59., Hungary

Responsible person: Mr. Edward Someus

Telephone number: +36-20-201-7557

E-mail address: edward@terrenum.net

1.4. Emergency Telephone number: +36-20-201-7557

(available only during office hours)

For non emergency assistance: +36-20-201-7557

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

2. Hazards Identification

Information pertaining to particular dangers for man and environment:

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available.

MUTAGENIC EFFECTS: Not available.

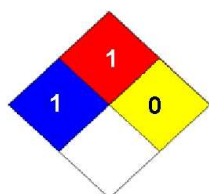
TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

Repeated or prolonged exposure is not known to aggravate medical condition.

Classification system:

NFPA rating:(scale 0-4)



Health=1

Fire=1

Reactivity=0

HMS-rating (scale 0-4)



Health=1

Fire=1

Reactivity=0

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

3. Composition/Data on components

3.1 Chemical characterization:

CAS No. Description:	8021-99-6
Chemical Name:	Not available
Chemical Formula	Ca ₃ (PO ₄) ₂ and C
CAS No. Description:	8021-99-6

3.2. Composition:

Carbon	10-12% weight
Tricalcium Phosphate	88-90% weight

3.3. Identification number(s)

EC Number:	232-421-2
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4. First aid and measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

5. Fire-fighting measures

Flammability of the Product:	May be combustible at high temperature.
Auto-Ignition Temperature:	Not available.
Flash Points:	Not available.
Flammable Limits:	Not available.
Products of Combustion:	Not available.
Fire Hazards in Presence of Various Substances:	Slightly flammable to flammable in presence of heat. Non-flammable in presence of shocks.
Explosion Hazards in Presence of Various Substances:	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions:	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards:	Not available.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

6. Accidental release measures

Measures for environmental protection:

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Not available.

Precautions: Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Person-related safety precautions: Do not breathe dust.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

7. Handling and storage**7.1. Handling:****Precautions/ information for safe handling:**

Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust.

7.2. Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

Requirements to be met by storerooms and receptacles:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

Information about storage in one common storage facility:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

Further information about storage conditions:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

7.3. Specific use (s):

Not available.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

8.1. Exposure limit values

Components with limit values that require monitoring at the workplace:

For Inert or Nuisance Dust:

TWA: 15 (mg/m³) from OSHA (PEL) [United States] Inhalation Total.

TWA: 5 (mg/m³) from OSHA (PEL) [United States] Inhalation Respirable.

Consult local authorities for acceptable exposure limits.

8.2. Exposure controls**8.2.1. Personal protective equipment**

Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

General protective and hygienic measures:

Respiratory protection:

Wear suitable dust mask.

Protection of hands:

Rubber or plastic gloves.

Eye protection:

8.2.2. Environmental exposure control

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

8. Physical and chemical properties

9.1. General information	8.0 +/- 0,5
Physical state and appearance:	Solid (powdered solid)
Colour:	Black
Odour:	Odourless.
9.2. Important health, safety and environmental information:	
PH	
Boiling point/boiling range:	Not available
Molecular weight	Not available
Critical temperature:	Not available
Specific gravity:	2.6
Vapour pressure	Not applicable
Volatility:	Not available
Odour Threshold:	Not available
Water/oil Dist. Coeff.	Not available
Ionicity (in Water):	Not available
Dispersion properties:	Not available
Solubility:	Insoluble in cold water, hot water

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

9. Stability and reactivity

Stability:	The product is stable
Instability Temperature:	Not available.
Conditions of Instability:	Excess heat
Incompatibility with various substances:	Not available.
Corrosivity:	Not available.
Special Remarks on Reactivity:	Not available.
Special Remarks on Corrosivity:	Not available.
Polymerization:	Will not occur.
Dangerous reactions:	No dangerous reactions known.
Dangerous products of decomposition:	No dangerous decomposition products known

10. Toxicological information

Routes of Entry:	Inhalation. Ingestion.
Toxicity to Animals:	
LD50	Not available
LC50	Not available
Chronic Effects on Humans:	Not available.
Other Toxic Effects on Humans:	Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals:	Not available
Special Remarks on Chronic Effects on Humans:	Not available

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Eyes: May cause mechanical eye irritation.

Inhalation: May cause respiratory tract irritation.

Ingestion: No recognized health hazard.

Chronic Potential Health Effects:

Inhalation: Prolonged or repeated inhalation of high concentrations may lead to a depositoin of tricalcium

phosphate crystals in the lung tissue

The toxicological properties of this substance have not been fully investigated

Sensitization:

No sensitization effects known

11. Ecological information**12.1.** Ecotoxicity

Not available

BOD5 and COD

Not available

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation:

The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.**Bioaccumulative potential**

Not available.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

12. Disposal consideration

Waste Disposal:

Waste and packagings must be disposed of in accordance with the EU and local environmental control regulations.

Dispose of according to national and local regulations. Material is not classified as hazardous, dangerous or toxic. Approved landfill sites can be used. If the material has been used on processes involving hazardous gases/vapours, disposal must take into account their possible presence in the sorbent

13. Transport information

DOT regulation:

Not a DOT controlled material

This product is not classified as dangerous under transport regulations.

LAND transport ADR/DIR

Not an ADR/DIR controlled material

This product is not classified as dangerous under transport regulations.

Maritime transport IMDG

This product is not classified as dangerous under transport regulations.

Air transport ICAO-TI and IATA-DGR:

This product is not classified as dangerous under transport regulations.

Terra Humana Ltd.

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Animal Bone charcoal

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

14. Regulatory information**European Regulatory Information:**

This product has been classified in accordance with the Dangerous Substances Directive (67/548/EEC, as amended) and the Preparations Directive (88/379/EEC, as amended),

Classified as dangerous to supply :	No
Risk Phrases :	Not applicable
Safety Phrases :	Not applicable
Symbols :	None

DSCL:

This product is not classified according to the EU regulations. Not applicable.

Protective Equipment:	Gloves.,Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.
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15. Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

This MSDS is compiled in accordance with the EU Safety Data Sheet Directive 91/155/EEC.

Although the information and recommendations in this data sheet are to the best of our knowledge correct, it is recommended that you make your own determination of the material's suitability for your purpose before you use it. The information contained in this data sheet has been reproduced from the manufacturers data, the accuracy of this information is the responsibility of the manufacturer.

PROTECTOR (FUNGAL) MATERIAL SAFETY DATA SHEET

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

1. Identification of substance

1.1. Identification of the substance or preparation

Product name/Trade name: PROTECTOR(animal bone charcoal and Trichoderma harzianum)

Synonym: Animal bone charcoal, Bone black, bone charcoal,

1.2. Use of the substance/preparation

1.3. Manufacturer/Supplier

Manufacturer's name: Terra Humana Ltd.

Address (Number, Street, City, Code): H-1222 Budapest, Széchenyi 59., Hungary

Responsible person: Mr. Edward Someus

Telephone number: +36-20-201-7557

E-mail address: edward@terrenum.net

1.4. Emergency Telephone number: +36-20-201-7557

(available only during office hours)

For non emergency assistance: +36-20-201-7557

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

2. Hazards Identification

Information pertaining to particular dangers for man and environment:

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available.

MUTAGENIC EFFECTS: Not available.

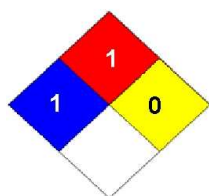
TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

Repeated or prolonged exposure is not known to aggravate medical condition.

Classification system:

NFPA rating:(scale 0-4)



Health=1

Fire=1

Reactivity=0

HMS-rating (scale 0-4)



Health=1

Fire=1

Reactivity=0

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

3. Composition/Data on components**Composition/information on ingredients**

Animal bone charcoal 99%

Animal bone charcoal:Chemical Characterisation

CAS No. Description: 8021-99-6

Chemical Name: Not available

Chemical Formula $\text{Ca}_3(\text{PO}_4)_2$ and CComposition:

Carbon 10-12% weight

Tricalcium Phosphate 88-90% weight

Identification number(s)

EC Number: 232-421-2

Trichoderma harzianum: 1%

CAS No. Description: Not available

Chemical Name: Not available

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

4. First aid and measures

Eye Contact: Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Inhalation: If inhaled, remove to fresh air. If symptoms occur, get medical attention.

Serious Inhalation: Not available.

Ingestion: Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

5. Fire-fighting measures

Flammability of the Product:	May be combustible at high temperature.
Auto-Ignition Temperature:	Not available.
Flash Points:	Not available.
Flammable Limits:	Not available.
Products of Combustion:	Not available.
Fire Hazards in Presence of Various Substances:	Slightly flammable to flammable in presence of heat. Non-flammable in presence of shocks.
Explosion Hazards in Presence of Various Substances:	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions:	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
Special Remarks on Fire Hazards:	Not available.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

6. Accidental release measures

Measures for environmental protection:

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill: Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

Not available.

Precautions: Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Person-related safety precautions: Do not breathe dust.

Measures for cleaning/collecting: Clean spills with chlorine bleach or 70% ethanol. Autoclave materials and waste. Dispose of waste in accordance with federal, state, and local safety regulations.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

7. Handling and storage**7.1. Handling:****Precautions/ information for safe handling:**

Keep out of sewers and waterways. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not breathe dust. Avoid contact with eyes, skin, and clothing.

7.2. Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Store at 4-10 °C

Requirements to be met by storerooms and receptacles:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Store at 4-10 °C

Information about storage in one common storage facility:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Store at 4-10 °C

Further information about storage conditions:

Keep container tightly closed. Keep container in a cool, well-ventilated area. Store at 4-10 °C

7.3. Specific use (s):

Not available.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

8. Exposure controls/personal protection

8.1. Exposure limit values

Components with limit values that require monitoring at the workplace:

For Inert or Nuisance Dust:

TWA: 15 (mg/m³) from OSHA (PEL) [United States] Inhalation Total.

TWA: 5 (mg/m³) from OSHA (PEL) [United States] Inhalation Respirable.

Consult local authorities for acceptable exposure limits.

8.2. Exposure controls

8.2.1. Personal protective equipment

Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

General protective and hygienic measures:

Respiratory protection: Wear suitable dust mask

Protection of hands: Rubber or plastic gloves.

8.2.2. Environmental exposure control

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

9. Physical and chemical properties**9.1. General information**

Physical state and appearance:	Solid (powdered solid)
Colour:	Black
Odour:	Odourless.

9.2. Important health, safety and environmental information:

PH	8.0 +/- 0,5
Boiling point/boiling range:	Not available
Molecular weight	Not available
Critical temperature:	Not available
Specific gravity:	2.6
Vapour pressure	Not applicable
Volatility:	Not available
Odour Threshold:	Not available
Water/oil Dist. Coeff.	Not available
Ionicity (in Water):	Not available
Dispersion properties:	Not available
Solubility:	Insoluble in cold water, hot water

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

10. Stability and reactivity

Stability:	The product is stable for 6 months at 20 °C
Instability Temperature:	Not available.
Conditions of Instability:	Excess heat
Incompatibility with various substances:	Not available.
Corrosivity:	Not available.
Special Remarks on Reactivity:	Not available.
Special Remarks on Corrosivity:	Not available.
Polymerization:	Will not occur.
Dangerous reactions:	No dangerous reactions known.
Dangerous products of decomposition:	No dangerous decomposition products known

11. Toxicological information

Routes of Entry:	Inhalation. Ingestion.
Toxicity to Animals:	
LD50	Not available
LC50	Not available
Chronic Effects on Humans:	Not available.
Other Toxic Effects on Humans:	Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals:	Not available
Special Remarks on Chronic Effects on Humans:	Not available

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Eyes: May cause mechanical eye irritation.

Inhalation: May cause respiratory tract irritation.

Ingestion: No recognized health hazard.

Chronic Potential Health Effects:

Inhalation: Prolonged or repeated inhalation of high concentrations may lead to a depositoin of tricalcium phosphate crystals in the lung tissue. The toxicological properties of this substance have not been fully investigated

Sensitization:

No sensitization effects known

12. Ecological information**12.1.** Ecotoxicity

Not available

BOD5 and COD

Not available

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation:

The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.**Bioaccumulative potential**

Not available.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

13. Disposal consideration

Waste Disposal:

Waste and packagings must be disposed of in accordance with the EU and local environmental control regulations.

Dispose of according to national and local regulations. Material is not classified as hazardous, dangerous or toxic. Approved landfill sites can be used. If the material has been used on processes involving hazardous gases/vapours, disposal must take into account their possible presence in the sorbent

14. Transport information

DOT regulation:

Not a DOT controlled material

This product is not classified as dangerous under transport regulations.

LAND transport ADR/DIR

Not an ADR/DIR controlled material

This product is not classified as dangerous under transport regulations.

Maritime transport IMDG

This product is not classified as dangerous under transport regulations.

Air transport ICAO-TI and IATA-DGR:

This product is not classified as dangerous under transport regulations.

Terra Humana Ltd.

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PROTECTOR (FUNGAL)

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 10/06/2011

15. Regulatory information**European Regulatory Information:**

This product has been classified in accordance with the Dangerous Substances Directive (67/548/EEC, as amended) and the Preparations Directive (88/379/EEC, as amended),

Classified as dangerous to supply :	No
Risk Phrases :	Not applicable
Safety Phrases :	Not applicable
Symbols :	None

DSCL:

This product is not classified according to the EU regulations. Not applicable.

Protective Equipment:	Gloves.,Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Safety glasses.
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16. Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

This MSDS is compiled in accordance with the EU Safety Data Sheet Directive 91/155/EEC.

Although the information and recommendations in this data sheet are to the best of our knowledge correct, it is recommended that you make your own determination of the material's suitability for your purpose before you use it. The information contained in this data sheet has been reproduced from the manufacturers data, the accuracy of this information is the responsibility of the manufacturer.

MSDS FOR ABC WITH BACTERIAL INOCULUM

Plant Research International

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Animal Bone Charcoal inoculated with bacteria

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 18/04/2011

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

BACTERIAL NAME: Pseudomonas chlororaphis 4.4.1
COMPANY: Plant Research International
STREET ADDRESS: Droevendaalsesteeg 1
ZIP, CITY, COUNTRY: 6700 AA, Wageningen, the Netherlands
TELEPHONE: +31 (0)317 480664, Joeke Postma
+31 (0)317 480517, Els Nijhuis
EMAIL: joeke.postma@wur.nl; els.nijhuis@wur.nl

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE: Animal Bone Charcoal (ABC) inoculated with bacteria (Pseudomonas chlororaphis 4.4.1).
CAS NO.: None

SECTION 3: HAZARDS IDENTIFICATION

ROUTES OF ENTRY: Inhalation of dust. Skin or eye contact

POTENTIAL HEALTH EFFECTS

EYES: May cause irritation of the eyes
SKIN: May cause irritation of the skin.
INGESTION: May cause nausea or vomiting.
INHALATION: If present as high concentration of air borne dust, prolonged contact may cause irritation to nose and throat, May cause coughing and shortness of breath
CARCINOGENICITY: Not listed.

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Animal Bone Charcoal inoculated with bacteria

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SECTION 4: FIRST AID MEASURES

- EYES:** Rinse opened eyes for at least 15 minutes. If eyes become irritated, get medical attention.
- SKIN:** Clean skin with disinfectant, wash with soap and water.
- INGESTION:** Rinse mouth. If irritation or symptoms occur, get medical attention.
- INHALATION:** Find fresh air. If symptoms occur, get medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

- EXTINGUISHING MEDIA:** Water, carbon dioxide, dry chemical powder, or foam
- SPECIAL PROCEDURES:** Wear protective mask, goggles, gloves and clothing to prevent inhalation of dust and to prevent contact with skin and eyes.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL PRECAUTIONS:

Keep out of sewers and waterways.

- CLEAN-UP METHODS:** Clean spills with chlorine bleach or 70% ethanol. Autoclave materials and waste. Dispose of waste in accordance with federal, state, and local safety regulations.

SECTION 7: HANDLING AND STORAGE

- HANDLING:** Avoid contact with eyes, skin, and clothing.
Avoid inhalation of dust.
- STORAGE:** Store under dry conditions at 4°C.
Keep bag closed when not in use.
Store away from food and direct sunlight or high temperature.

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Animal Bone Charcoal inoculated with bacteria

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Safety shower and eye bath

VENTILATION: mechanical exhaust required for working with dry inoculated ABC material.

RESPIRATORY

PROTECTION: Protective dust mask

EYE PROTECTION: Dust proof goggles

SKIN PROTECTION: Protective gloves and clothing

WORK HYGIENIC

PRACTICES: Use safe laboratory practices.
Wash arms, hands and face with soap and water after handling material.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

FORM: Dried black granules containing bacteria supplied with growth medium

Odor: Characteristic odour

COLOR: Black

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Inoculated ABC is stable for approximately 1 month at 4°C

CONDITIONS TO AVOID: Storing at higher temperatures will affect stability of inoculated bacteria

MATERIALS TO AVOID: None known

HAZARDOUS DECOMPOSITION

OR BY-PRODUCTS: None known

HAZARDOUS

POLYMERIZATION: None

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Animal Bone Charcoal inoculated with bacteria

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SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL

INFORMATION: May be irritating to respiratory system, eyes and skin.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL

INFORMATION: No data.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

METHOD: Observe all federal, state, and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

HAZARD CLASS: Non-hazardous

WATER TRANSPORTATION

HAZARD CLASS: Non-hazardous

AIR TRANSPORTATION

HAZARD CLASS: Non-hazardous

SECTION 15: REGULATORY INFORMATION

None

SECTION 16: OTHER INFORMATION

DISCLAIMER: The above information is correct to the best of our knowledge, but does not purport to be all inclusive and shall be used only as a guide. Plant Research International shall not be held liable for any damage resulting from handling or from contact with the above product.

MSDS FOR BACTERIAL INOCULUM

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Pseudomonas chlororaphis inoculum

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Date of preparation: 18/04/2011

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

BACTERIAL NAME: *Pseudomonas chlororaphis*
COMPANY: Plant Research International
STREET ADDRESS: Droevendaalsesteeg 1
ZIP, CITY, COUNTRY: 6700 AA, Wageningen, the Netherlands
TELEPHONE: +31 (0)317 476251
FAX: +31 (0)317 478094

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE: *Pseudomonas chlororaphis*.
CAS NO.: None

SECTION 3: HAZARDS IDENTIFICATION

ROUTES OF ENTRY: Skin or eye contact
POTENTIAL HEALTH EFFECTS
EYES: May cause irritation of the eyes
SKIN: May cause irritation of the skin.
INGESTION: May cause nausea or vomiting.
INHALATION: No toxicity expected from inhalation.
CARCINOGENICITY: Not listed.

SECTION 4: FIRST AID MEASURES

EYES: Rinse opened eyes for at least 15 minutes. If eyes become irritated, get medical attention.
SKIN: Clean skin with disinfectant, wash with soap and water.
INGESTION: Rinse mouth. If irritation or symptoms occur, get medical attention.
INHALATION: Find fresh air. If symptoms occur, get medical attention.

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Pseudomonas chlororaphis inoculum

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SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Water, carbon dioxide, dry chemical powder, or foam

SPECIAL PROCEDURES: Wear protective clothing to prevent contact with skin and eyes.

SECTION 6: ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL

Keep out of sewers and waterways.

PRECAUTIONS:

CLEAN-UP METHODS: Clean spills with chlorine bleach or 70% ethanol. Autoclave materials and waste. Dispose of waste in accordance with federal, state, and local safety regulations.

SECTION 7: HANDLING AND STORAGE

HANDLING: Avoid contact with eyes, skin, and clothing.

STORAGE: Store at 4-10°C.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Safety shower and eye bath

VENTILATION: General ventilation

RESPIRATORY

PROTECTION: Not required

EYE PROTECTION: Not required

SKIN PROTECTION: Protective gloves

WORK HYGIENIC

PRACTICES: Use safe laboratory practices.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

FORM: Bacteria supplied with growth medium

Odor: Odorless

COLOR: Orange

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Pseudomonas chlororaphis inoculum

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SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable for approximately 1-2 months at 4 °C

CONDITIONS TO AVOID: None known

MATERIALS TO AVOID: None known

HAZARDOUS DECOMPOSITION

OR BY-PRODUCTS: None known

HAZARDOUS

POLYMERIZATION: None

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL

INFORMATION: May be irritating to eyes and skin.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL

INFORMATION: No data.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

METHOD: Observe all federal, state, and local laws and regulations.

SECTION 14: TRANSPORT INFORMATION

HAZARD CLASS: Non-hazardous

WATER TRANSPORTATION

HAZARD CLASS: Non-hazardous

AIR TRANSPORTATION

HAZARD CLASS: Non-hazardous

SECTION 15: REGULATORY INFORMATION

None

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Pseudomonas chlororaphis inoculum

Material Safety Data Sheet according to 91/155 EEC

Date of preparation: 18/04/2011

SECTION 16: OTHER INFORMATION

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