SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

MATERIAL SAFETY DATA SHEET
CARBON BLACK
ACETYLENE BLACK

Company Identification: JACAAB LLC
4155 Manchester Avenue
St. Louis, MO  63110

Product Information:
MSDS Requests: (314) 652-5400
Technical Information: (800) 852-5531

24-Hour Emergency Telephone Numbers
HEALTH: CHEMTREC  800-424-9300

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS NUMBER</th>
<th>AMOUNT</th>
</tr>
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<tbody>
<tr>
<td>CARBON BLACK</td>
<td>1333-86-4</td>
<td>100.00 % weight</td>
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</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARBON BLACK</td>
<td>ACGIH_TLV</td>
<td>3.5 mg/m3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>CARBON BLACK</td>
<td>OSHA_PEL</td>
<td>3.5 mg/m3</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Odorless black powder.

- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED

IMMEDIATE HEALTH EFFECTS:
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Not expected to be harmful to internal organs if absorbed through the skin. Contact with the skin is not expected to cause prolonged or significant irritation.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: The dust from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER HEALTH EFFECTS:
Cancer: May cause cancer in laboratory animals, but the available information is inadequate to determine if this material can cause cancer in humans.
See Section 11 for additional information. Risk depends on duration and level of exposure.
SECTION 4  FIRST AID MEASURES

Eye: No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get medical attention. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5  FIRE FIGHTING MEASURES

The ignition temperature of this material in air is approximately 900°C. If ignited, flames may not be visible in the burning powder. Some heat and smoke may be noticeable. Soaking with water may spread the fire due to the burning powder floating on the water. High pressure fire extinguishing equipment may blow the burning powder into other areas resulting in more fires. RECOMMENDED ACTION: If possible, isolate the burning powder into an open area (preferably outside), monitor, and allow the fire to burn it out. Gently applying a fine water mist to the area of the fire may be helpful. Stop spraying if water starts to puddle. Eliminating the source of oxygen may also be helpful. DO NOT spray with high pressure fire extinguishers.

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0
FLAMMABLE PROPERTIES:
Flashpoint: NDA
Autoignition: 900 °C (1652°F)
Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus. This material will burn although it is not easily ignited.
Combustion Products: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

SECTION 6  ACCIDENTAL RELEASE MEASURES

Spill Management: Clean up spills immediately, observing precautions in Exposure Controls/Personal Protection section. Sweep up material and place in a disposable container.
Reporting: This product is neither listed as a hazardous waste nor does it exhibit any of the characteristics that would cause it to be classified or disposed of as a RCRA hazardous waste.

SECTION 7  HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL.

Precautionary Measures: Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all
operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, ‘Flammable and Combustible Liquids’, National Fire Protection Association (NFPA 77), ‘Recommended Practice on Static Electricity’, and/or the American Petroleum Institute (API) Recommended Practice 2003, ‘Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents’.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: No skin protection is ordinarily required under normal conditions of use.

Respiratory Protection: Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Dusts and Mists

Occupational Exposure Limits:

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit</th>
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<td>CARBON BLACK</td>
<td>OSHA_PEL</td>
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<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Odorless black powder.
pH: 6.5 - 7.5
VAPOR PRESSURE: NA
VAPOR DENSITY (AIR=1): NA
BOILING POINT: 3500 °C (6332°F)
SOLUBILITY: NDA
DENSITY: 1.75 g/cm³

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Conditions to Avoid: No Data Available
Incompatibility With Other Materials: No data available
Hazardous Decomposition Products: No Data Available
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: The oral LD50 is undetermined.
Acute Dermal Toxicity: The dermal LD50 is undetermined.

Eye Irritation: This material is not expected to be irritating to the eyes.
Skin Irritation: This material is not expected to be irritating to the skin.
Respiratory Tract Irritation: This material is a mild irritant to the respiratory tract.

ADDITIONAL TOXICOLOGY INFORMATION:

The International Agency for Research on Cancer (IARC) has classified carbon black as a Group 2B carcinogen (possibly carcinogenic to humans) based on sufficient evidence in animals and inadequate evidence in humans. Carbon black has not been listed as a carcinogen by the National Toxicology Program or the Occupational Safety and Health Administration. Acetylene black, a high purity carbon black, is made from the thermal decomposition of acetylene gas. It is a pure form of carbon containing less than 0.2 ppm polycyclic aromatic hydrocarbons (PAHs). Therefore, acetylene black is not expected to directly interact with DNA to present a cancer risk by skin exposure or by inhalation.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:
The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE:
This material is not expected to present an environmental problem.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

US DOT
NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION
SECTION 15  REGULATORY INFORMATION

SARA 311/312 CATEGORIES:
1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:
04A = IARC Group 1
04B = IARC Group 2A
04C = IARC Group 2B
05 = NTP Carcinogen
06 = OSHA Carcinogen
09 = TSCA 12(b)
10 = TSCA Section 4
11 = TSCA Section 8(a) CAIR
12 = TSCA Section 8(a) PAIR
13 = TSCA Section 8(d)
15 = SARA Section 313
16 = CA Proposition 65
17 = MA RTK
18 = DOT Marine Pollutant
20 = PA RTK
21 = TSCA Section 5(a)
25 = CAA Section 112 HAPs
26 = CWA Section 311
28 = CWA Section 307
30 = RCRA Waste P-List
31 = RCRA Waste U-List
32 = RCRA Appendix VIII
33 = MN Hazardous Substance

The following components of this material are found on the regulatory lists indicated.
CARBON BLACK: 04C, 16, 17, 18, 20, 33

CHEMICAL INVENTORY LISTINGS:
AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).
CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).
PEOPLE’S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.
EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.
KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.
PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

SECTION 16  OTHER INFORMATION

NFPA RATINGS:
Health: 1  Flammability: 1  Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

**REVISION STATEMENT:** This revision updates the transportation information, please review section 14.

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>STEL</td>
<td>Short-term Exposure Limit</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Government - Industrial Hygienists</td>
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<tr>
<td>NIOSH</td>
<td>National Institute of Safety &amp; Health</td>
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<tr>
<td>WHMIS</td>
<td>Workplace Hazardous Materials - Information System</td>
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<tr>
<td>EINECS</td>
<td>European Inventory of existing - Commercial Chemical Sales</td>
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<tr>
<td>SARA</td>
<td>Superfund Amendments and - Reauthorization Act.</td>
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<tr>
<td>EC50</td>
<td>Effective Dose</td>
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<tr>
<td>LD50</td>
<td>Lethal Dose</td>
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<tr>
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<td>No Data Available</td>
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<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
</tr>
<tr>
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<td>Central Nervous System</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
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<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
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<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Agency</td>
</tr>
<tr>
<td>IRAC</td>
<td>Intl. Agency for Research on Cancer</td>
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<tr>
<td>RCRA</td>
<td>Resource Conservation Recovery Act</td>
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<td>NA</td>
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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.