MATERIAL SAFETY DATA SHEET WHITE PLA

Version Number 1.0 Revision Date 11/06/2012

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| POLYONE CORPORATION 33587 Walker Road, Avon Lake, OH 44012 | | | | |
|---|---|--|--|--|
| Telephone Emergency telephone number | : | 1 (440) 930-1000 or 1 (866) POLYONE CHEMTREC 1-800-424-9300 (24hrs for spill, leak, fire, exposure or accident). | | |
| Product name | : | WHITE PLA | | |
| Product code | : | CC10171811 | | |
| Chemical Name | : | Mixture | | |
| CAS-No. | : | Mixture | | |
| Product Use | : | Industrial Applications | | |

CACNO Waight managet Components

| Components | CAS-NO. | weight percent |
|------------------|------------|----------------|
| Titanium dioxide | 13463-67-7 | 30 - 60 |
| | | |

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This mixture has not been evaluated as a whole. Information provided on the health effects of this product is based on individual components. All ingredients are bound and potential for hazardous exposure as shipped is minimal. However, some vapors may be released upon heating and the enduser (fabricator) must take the necessary precautions (mechanical ventilation, respiratory protection, etc.) to protect employees from exposure.

POTENTIAL HEALTH EFFECTS

| Routes of Exposure: | : Inhalation, Ingestion, Skin contact |
|---------------------|---|
| Acute exposure | |
| Inhalation | : Resin particles, like other inert materials, can be mechanically irritating. |
| Ingestion | : May be harmful if swallowed. |
| Eyes | : Resin particles, like other inert materials, are mechanically irritating to eyes. |
| Skin | : Experience shows no unusual dermatitis hazard from routine handling. |
| Chronic exposure | : Refer to Section 11 for Toxicological Information. |

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| Medical Conditions Aggravated by Exposure: | : None known. |
|---|--|
| | 4. FIRST AID MEASURES |
| Inhalation | : Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. When symptoms persist or in all cases o doubt seek medical advice. |
| Ingestion | : Do not induce vomiting without medical advice. When symptoms persist or in all cases of doubt seek medical advice. |
| Eyes | : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, seek medical attention. |
| Skin | : Wash off with soap and plenty of water. If skin irritation persists seek medical attention. |
| | 5. FIREFIGHTING MEASURES |
| Flash point | : not applicable |
| Flammable Limits Upper explosion limit Lower explosion limit Auto-ignition temperature Suitable extinguishing media Special Fire Fighting Procedures Unusual Fire/Explosion Hazards | not applicable not applicable not applicable Carbon dioxide blanket, Water spray, Dry powder, Foam. Fullface self-contained breathing apparatus (SCBA) used in positive pressure mode should be worn to prevent inhalation of airborne contaminants. Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen (NOx), other hazardous materials, and smoke are all possible. |
| | 6. ACCIDENTAL RELEASE MEASURES |
| Personal precautions | : Wear appropriate personal protection during cleanup, such as impervious gloves, boots and coveralls. |
| Environmental precautions | : Should not be released into the environment. The product should not be allowed to enter drains, water courses or the soil. |
| Methods for cleaning up | : Clean up promptly by sweeping or vacuum. Package all material in plastic, cardboard or metal containers for disposal. |
| | 7. HANDLING AND STORAGE |
| Handling | : Take measures to prevent the build up of electrostatic charge. Heat only in areas with appropriate exhaust ventilation. |



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| Storage | : Keep containers dry and tightly closed to avo and contamination. Keep in a dry, cool place | |
|-----------------------------------|---|--|
| 8. EXI | POSUI | RE CONTROLS/PERSONAL PROTECTION |
| Respiratory protection | : | No personal respiratory protective equipment normally required. |
| Eye/Face Protection | : | Safety glasses with side-shields |
| Hand protection | : | Protective gloves |
| Skin and body protection | : | Long sleeved clothing |
| Additional Protective Measures | : | Safety shoes |
| General Hygiene Considerations | : | Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. |
| Engineering measures | : | Heat only in areas with appropriate exhaust ventilation. Provide appropriate exhaust ventilation at machinery. |
| Exposure limit(s) | | |

| Components | Value | Exposure time | Exposure type | List: |
|------------------|----------|---------------------------|---------------|----------|
| Titanium dioxide | 10 mg/m3 | Time Weighted Average | | ACGIH |
| | | (TWA): | | |
| | 15 mg/m3 | PEL: | Total dust. | OSHA Z1 |
| | 10 mg/m3 | Time Weighted Average | Total dust. | OSHA Z1A |
| | | (TWA): | | |
| | 10 mg/m3 | Time Weighted Average | as Ti | MX OEL |
| | | (TWA): | | |
| | 20 mg/m3 | Short Term Exposure Limit | as Ti | MX OEL |
| | | (STEL): | | |

| | 9. PHYSICAL AND CHE | MICAL PROPERTIES | |
|--|--|---|---|
| Form Appearance Colour Odour Melting point/range Boiling Point: Water solubility | solid pellets WHITE very faint Not determined not applicable insoluble | Evaporation rate Specific Gravity Bulk density Vapour pressure Vapour density pH | Not applicable Not determined Not established not applicable not applicable not applicable |
| | 10. STABILITY AN | D REACTIVITY | |
| Stability | : The product is stal | ole if stored and handled as | prescribed. |

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Version Number 1.0 Print Date 11/6/2012 Revision Date 11/06/2012 Hazardous Polymerization : Will not occur. Conditions to avoid Keep away from oxidizing agents and open flame. To avoid thermal : decomposition, do not overheat.

Incompatible Materials : Incompatible with strong acids and oxidizing agents. Hazardous decomposition : Carbon dioxide (CO2), carbon monoxide (CO), oxides of nitrogen

(NOx), other hazardous materials, and smoke are all possible.

11. TOXICOLOGICAL INFORMATION

This mixture has not been evaluated as a whole for health effects. Exposure effects listed are based on existing health data for the individual components which comprise the mixture.

Toxicity Overview

products

This product contains the following components which in their pure form have the following characteristics:

| CAS-No. | Chemical Name | Effect | Target Organ |
|------------|------------------|------------------|---------------------|
| 13463-67-7 | Titanium dioxide | Systemic effects | Respiratory system. |

Carcinogenicity

This product contains the following components which, in their pure form, have the following carcinogenicity data:

| CAS-No. | Chemical Name | OSHA | IARC | NTP |
|------------|------------------|------|------|-----|
| 13463-67-7 | Titanium dioxide | no | 2B | no |

IARC Carcinogen Classifications:

1 - The component is carcinogenic to humans.

2A - The component is probably carcinogenic to humans.

2B - The component is possibly carcinogenic to humans.

NTP Carcinogen Classifications:

1 - The component is known to be a human carcinogen.

2 - The component is reasonably anticipated to be a human carcinogen.

12. ECOLOGICAL INFORMATION

| Persistence and degradability | : | Not readily biodegradable. |
|-------------------------------|---|--|
| Environmental Toxicity | : | Chemicals are not readily available as they are bound within the polymer matrix. |
| Bioaccumulation Potential | : | Chemicals are not readily available as they are bound within the polymer matrix. |
| Additional advice | : | no data available |

13. DISPOSAL CONSIDERATIONS



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|--|---|
| | |
| Product | : Like most thermoplastic plastics the product can be recycled. Where possible recycling is preferred to disposal or incineration. The generator of waste material has the responsibility for proper waste classification, transportation and disposal in accordance with applicable federal, state/provincial and local regulations. |
| Contaminated packaging | : Recycling is preferred when possible. The generator of waste material has the responsibility for proper waste classification, transportation and disposal in accordance with applicable federal, state/provincial and local regulations. |
| | 14. TRANSPORT INFORMATION |
| U.S. DOT Classification | : Not regulated for transportation. |
| | |
| ICAO/IATA | : Refer to specific regulation. |
| IMO/IMDG (maritime) | : Refer to specific regulation. |
| | 15. REGULATORY INFORMATION |
| US Regulations: | |
| OSHA Status | : Classified as hazardous based on components. |
| TSCA Status | : All components of this product are listed on or exempt from the TSCA Inventory. |
| US. EPA CERCLA Hazardo | us Substances (40 CFR 302) |
| not applicable | |
| not applicable | |
| | |
| California Proposition 65 | n : Not applicable |
| SARA Title III Section 302 I | Extremely Hazardous Substance |
| Unless specific chemicals are | e identified under this section, this product is Not Applicable under this regulation |
| | |
| SARA Title III Section 313 | Foxic Chemicals: |
| Unless specific chemicals are | e identified under this section, this product is Not Applicable under this regulation |
| | |
| | |

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Canadian Regulations:

| Chemical Name | | | CAS-No. | Weight | NPRI ID# |
|----------------------|---|-----------------------------------|-----------|-----------------------------|------------|
| Aluminum oxide | | | 1344-28-1 | 0.10 - 1.00 | |
| | | | 1011 201 | 0.110 1100 | I |
| WHMIS Classification | : | D2A | | | |
| DSL | : | All components Substances List | | are on the Canadia empt. | n Domestic |
| ational Inventories: | | | | | |
| Australia AICS | : | Listed | | | |
| China IECS | : | Listed | | | |
| Europe EINECS | : | Listed | | | |
| Japan ENCS | : | Not determined | | | |
| Korea KECI | : | Listed | | | |
| Philippines PICCS | : | Not determined | | | |

16. OTHER INFORMATION

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.