

HT4500**000000025422**

Version 1.0

Revision Date 07/31/2020

Print Date 08/03/2020

SECTION 1. IDENTIFICATION

Product name : HT4500

Number : 000000025422

Product Use Description : Electronic Materials

Note : This sample is for research and development purposes only. The handling and use of this material must be supervised by qualified individuals. The chemical, physical and toxicological properties of this material have not been fully investigated. Use due precaution in handling, storage and disposal.

Manufacturer or supplier's details : Honeywell International Inc.
115 Tabor Road
Morris Plains, NJ 07950-2546

For more information call : +1-509-252-2200
833-543-5059(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
: Transportation (CHEMTREC): 1-800-424-9300 or
+1-703-527-3887
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : paste

Color : green

Odor : none

Classification of the substance or mixture

Not a hazardous substance or mixture according to the Globally Harmonised System (GHS).

Hazards not otherwise : Repeated or prolonged exposure may irritate eyes, skin and

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classified respiratory system.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

| Chemical name | CAS-No. | Concentration |
|----------------------|------------|-----------------|
| Aluminium oxide | 1344-28-1 | 80.00 - 90.00 % |
| Zinc oxide | 1314-13-2 | 2.00 - 15.00 % |
| Polydimethylsiloxane | 63148-62-9 | 5.00 - 8.00 % |

SECTION 4. FIRST AID MEASURES

- Inhalation : Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician if irritation develops or persists.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.
- Ingestion : Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is fully conscious, give a cupful of water. Call a physician.

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Notes to physician

Indication of immediate medical attention and special treatment needed, if necessary : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Water spray
Foam
Carbon dioxide (CO₂)

Specific hazards during firefighting : In case of fire hazardous decomposition products may be produced such as:
Aluminum oxides
carbon oxides (CO, CO₂).

Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Wear personal protective equipment.
Ensure adequate ventilation.
Do not swallow.
Do not breathe vapours, mist or gas.
Avoid contact with skin, eyes and clothing.

Environmental precautions : Should not be released into the environment.
Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up : Ventilate the area.
Sweep up and shovel into suitable containers for disposal.
Dispose of in accordance with local regulations.

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SECTION 7. HANDLING AND STORAGE**Handling**

Precautions for safe handling : Wear personal protective equipment.
Use only in well-ventilated areas.
Do not swallow.
Do not breathe vapours, mist or gas.
Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Storage

Conditions for safe storage, including any incompatibilities : Keep containers tightly closed in a dry, cool and well-ventilated place.
Store away from incompatible substances.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.
Legal requirements are to be considered in regard of the selection, use and care of personal protective equipment.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.

Engineering measures : Use with local exhaust ventilation.

Eye protection : Safety glasses with side-shields

Hand protection : Protective gloves
Gloves must be inspected prior to use.
Replace when worn.

Skin and body protection : Protective suit

Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.

Hygiene measures : Handle in accordance with good industrial hygiene and safety

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practice.

When using do not eat, drink or smoke.

Wash hands before breaks and immediately after handling the product.

Remove and wash contaminated clothing before re-use.

Keep working clothes separately.

Exposure Guidelines

| Components | CAS-No. | Value | Control parameters | Update | Basis |
|---------------------|-----------|---|--------------------|--------|--|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 1 mg/m3 | 2009 | ACGIH:US. ACGIH Threshold Limit Values, as amended |
| Further information | : | Form of exposure : Respirable fraction. | | | |

| | | | | | |
|---------------------|-----------|---|---------|------------|--|
| Aluminium oxide | 1344-28-1 | PEL : Permissible exposure limit | 5 mg/m3 | 02 2006 | OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Respirable fraction. | | | |

| | | | | | |
|---------------------|-----------|-------------------------------------|----------|------------|--|
| Aluminium oxide | 1344-28-1 | PEL : Permissible exposure limit | 15 mg/m3 | 02 2006 | OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Total dust. | | | |

| | | | | | |
|---------------------|-----------|---|---------|------|---|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 5 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Respirable fraction. | | | |

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|-----------------|-----------|--------------------------------------|----------|------|--|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 10 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
|-----------------|-----------|--------------------------------------|----------|------|--|

| | | | | | |
|------------------------|---|--------------------------------|--|--|--|
| Further information | : | Form of exposure : Total dust. | | | |
|------------------------|---|--------------------------------|--|--|--|

| | | | | | |
|-----------------|-----------|--------------------------------------|--|------------|---|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 50 millions of particles per cubic foot of air | 03 2016 | Z3:US. OSHA Table Z-3 (29 CFR 1910.1000), as amended |
|-----------------|-----------|--------------------------------------|--|------------|---|

| | | | | | |
|------------------------|---|--------------------------------|--|--|--|
| Further information | : | Form of exposure : Total dust. | | | |
|------------------------|---|--------------------------------|--|--|--|

| | | | | | |
|-----------------|-----------|--------------------------------------|---------|------------|---|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 5 mg/m3 | 03 2016 | Z3:US. OSHA Table Z-3 (29 CFR 1910.1000), as amended |
|-----------------|-----------|--------------------------------------|---------|------------|---|

| | | | | | |
|------------------------|---|---|--|--|--|
| Further information | : | Form of exposure : Respirable fraction. | | | |
|------------------------|---|---|--|--|--|

| | | | | | |
|-----------------|-----------|--------------------------------------|----------|------------|---|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 15 mg/m3 | 03 2016 | Z3:US. OSHA Table Z-3 (29 CFR 1910.1000), as amended |
|-----------------|-----------|--------------------------------------|----------|------------|---|

| | | | | | |
|------------------------|---|--------------------------------|--|--|--|
| Further information | : | Form of exposure : Total dust. | | | |
|------------------------|---|--------------------------------|--|--|--|

| | | | | | |
|-----------------|-----------|--------------------------------------|--|------------|---|
| Aluminium oxide | 1344-28-1 | TWA : Time weighted average | 15 millions of particles per cubic foot of air | 03 2016 | Z3:US. OSHA Table Z-3 (29 CFR 1910.1000), as amended |
|-----------------|-----------|--------------------------------------|--|------------|---|

| | | | | | |
|------------------------|---|---|--|--|--|
| Further information | : | Form of exposure : Respirable fraction. | | | |
|------------------------|---|---|--|--|--|

| | | | | | |
|------------|-----------|--------------------------------------|---------|------|--|
| Zinc oxide | 1314-13-2 | TWA : Time weighted average | 2 mg/m3 | 2008 | ACGIH:US. ACGIH Threshold Limit Values, as amended |
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|---------------------|---|---|
| Further information | : | Form of exposure : Respirable fraction. |
|---------------------|---|---|

| | | | | | |
|------------|-----------|----------------------------------|----------|------|--|
| Zinc oxide | 1314-13-2 | STEL : Short term exposure limit | 10 mg/m3 | 2008 | ACGIH:US. ACGIH Threshold Limit Values, as amended |
|------------|-----------|----------------------------------|----------|------|--|

| | | |
|---------------------|---|---|
| Further information | : | Form of exposure : Respirable fraction. |
|---------------------|---|---|

| | | | | | |
|------------|-----------|----------------------------------|----------|------|---|
| Zinc oxide | 1314-13-2 | STEL : Short term exposure limit | 10 mg/m3 | 2005 | NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended |
|------------|-----------|----------------------------------|----------|------|---|

| | | |
|---------------------|---|--------------------------|
| Further information | : | Form of exposure : Fume. |
|---------------------|---|--------------------------|

| | | | | | |
|------------|-----------|---|----------|------|---|
| Zinc oxide | 1314-13-2 | Ceil_Tim e : Ceiling Limit Value and Time Period (if specified) : | 15 mg/m3 | 2005 | NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended |
|------------|-----------|---|----------|------|---|

| | | |
|---------------------|---|--------------------------|
| Further information | : | Form of exposure : Dust. |
|---------------------|---|--------------------------|

| | | | | | |
|------------|-----------|---|---------|------|---|
| Zinc oxide | 1314-13-2 | REL : Recommended exposure limit (REL): | 5 mg/m3 | 2005 | NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended |
|------------|-----------|---|---------|------|---|

| | | |
|---------------------|---|--------------------------|
| Further information | : | Form of exposure : Dust. |
|---------------------|---|--------------------------|

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|------------|-----------|---|---------|------|---|
| Zinc oxide | 1314-13-2 | REL : Recomm ended exposure limit (REL): | 5 mg/m3 | 2005 | NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards, as amended |
|------------|-----------|---|---------|------|---|

| | | | | | |
|---------------------|---|--------------------------|--|--|--|
| Further information | : | Form of exposure : Fume. | | | |
|---------------------|---|--------------------------|--|--|--|

| | | | | | |
|------------|-----------|---|----------|------------|---|
| Zinc oxide | 1314-13-2 | PEL : Permissi ble exposure limit | 15 mg/m3 | 02 2006 | OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended |
|------------|-----------|---|----------|------------|---|

| | | | | | |
|---------------------|---|--------------------------------|--|--|--|
| Further information | : | Form of exposure : Total dust. | | | |
|---------------------|---|--------------------------------|--|--|--|

| | | | | | |
|------------|-----------|---|---------|------------|---|
| Zinc oxide | 1314-13-2 | PEL : Permissi ble exposure limit | 5 mg/m3 | 02 2006 | OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended |
|------------|-----------|---|---------|------------|---|

| | | | | | |
|---------------------|---|---|--|--|--|
| Further information | : | Form of exposure : Respirable fraction. | | | |
|---------------------|---|---|--|--|--|

| | | | | | |
|------------|-----------|---|---------|------------|---|
| Zinc oxide | 1314-13-2 | PEL : Permissi ble exposure limit | 5 mg/m3 | 02 2006 | OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000), as amended |
|------------|-----------|---|---------|------------|---|

| | | | | | |
|---------------------|---|--------------------------|--|--|--|
| Further information | : | Form of exposure : Fume. | | | |
|---------------------|---|--------------------------|--|--|--|

| | | | | | |
|------------|-----------|--------------------------------------|----------|------|--|
| Zinc oxide | 1314-13-2 | TWA : Time weighted average | 10 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
|------------|-----------|--------------------------------------|----------|------|--|

| | | | | | |
|---------|---|--------------------------------|--|--|--|
| Further | : | Form of exposure : Total dust. | | | |
|---------|---|--------------------------------|--|--|--|

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| information | | | | | |
| Zinc oxide | 1314-13-2 | TWA : Time weighted average | 5 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Respirable fraction. | | | |
| Zinc oxide | 1314-13-2 | TWA : Time weighted average | 5 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Fume. | | | |
| Zinc oxide | 1314-13-2 | STEL : Short term exposure limit | 10 mg/m3 | 1989 | Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000), as amended |
| Further information | : | Form of exposure : Fume. | | | |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|-----------------------------|---|-------------------------|
| Physical state | : | paste |
| Color | : | green |
| Odor | : | none |
| Odor threshold | : | Note: No data available |
| pH | : | Note: Not applicable |
| Freezing point | : | Note: No data available |
| Boiling point/boiling range | : | Note: No data available |

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| Flash point | : Note: Not applicable |
| Evaporation rate | : Note: No data available |
| Lower explosion limit | : Note: Not applicable |
| Upper explosion limit | : Note: No data available |
| Vapor pressure | : Note: No data available |
| Vapor density | : Note: No data available |
| Density | : 3.2 g/cm ³ at 25 °C |
| Water solubility | : Note: No data available |
| Partition coefficient: n-octanol/water | : Note: No data available |
| Ignition temperature | : Note: No data available |
| Decomposition temperature | : Note: No data available |
| Viscosity, dynamic | : Note: No data available |
| Viscosity, kinematic | : Note: No data available |

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.

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| Chemical stability | : Stable under normal conditions. |
| Possibility of hazardous reactions | : Hazardous polymerisation does not occur. |
| Conditions to avoid | : No information available. |
| Incompatible materials | : Strong oxidizing agents Strong acids |
| Hazardous decomposition products | : In case of fire hazardous decomposition products may be produced such as: Aluminum oxides carbon oxides (CO, CO ₂). |

SECTION 11. TOXICOLOGICAL INFORMATION

| | |
|---------------------------|--|
| Acute oral toxicity | : Note: No data available |
| Acute inhalation toxicity | : Note: No data available |
| Acute dermal toxicity | : Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method |
| | : Note: No data available |
| Skin irritation | : Note: No data available |
| Eye irritation | : Note: No data available |
| Sensitisation | : Note: No data available |

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Further information : Note: No toxicology information is available.

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity effects**

Toxicity to fish : Note: No data available

Toxicity to daphnia and other aquatic invertebrates : Note: No data available

Toxicity to algae : Note: No data available

Further information on ecology

Additional ecological information : We have no quantitative data concerning the ecological effects of this product.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT Not dangerous goods

TDG Not dangerous goods

IATA Not dangerous goods

IMDG Not dangerous goods

SECTION 15. REGULATORY INFORMATION

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Inventories

- US. Toxic Substances Control Act : On TSCA Inventory
- Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory
- Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL
- Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory
- Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory
- Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory
- China. Inventory of Existing Chemical Substances (IECSC) : On the inventory, or in compliance with the inventory
- New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

- SARA 302 Components** : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
- SARA 313 Components** : The following components are subject to reporting levels established by SARA Title III, Section 313:
- : Aluminium oxide 1344-28-1
 - : Zinc oxide 1314-13-2
- SARA 311/312 Hazards** : Acute Health Hazard

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California Prop. 65 : This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Massachusetts RTK : Aluminium oxide 1344-28-1
: Zinc oxide 1314-13-2

New Jersey RTK : Aluminium oxide 1344-28-1
: Zinc oxide 1314-13-2

Pennsylvania RTK : Aluminium oxide 1344-28-1
: Zinc oxide 1314-13-2

SECTION 16. OTHER INFORMATION

| | HMIS III | NFPA |
|-----------------|-----------------|-------------|
| Health hazard | : 1 | 1 |
| Flammability | : 1 | 1 |
| Physical Hazard | : 0 | |
| Instability | : | 0 |

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further 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. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group