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NTE424 Non-Silicone Thermal Compound 1 oz. Plunger Tube

Description:

NTE424 heat sink compound is a grease-like, non-silicone, non-migrating material heavily impregnated with heat-conductive metal oxides. This formulation provides high thermal conductivity, low bleed and high temperature stability.

NTE424 has been engineered to solve the problems of contamination and migration associated with silicone-based products. A unique poly synthetic-based thermal grease use to insure quick, efficient heat transfer and dissipation for the full operational life of your hardware.

Key Features and Benefits:

- Non-Silicone Advantages/No Creep or Migration over Wide Temperature Range
- Low Interface Thermal Resistance ($0.03^{\circ}\text{C}-\text{In}^2/\text{W}$)
- High Thermal Conductivity, High Dielectric Strength
- Exceptionally Low Bleed and Evaporation
- Meets MIL-C-47113 & MIS-19846 Specifications
- Will Not harden, Dry-Out or Melt
- Will Not Contaminate Solder bath or Other Devices
- Non-Toxic
- Reworkable/Easy to Remove
- Easy to Dispense

Typical Properties:

Viscosity	Thixotropic Paste
Specific Gravity @ +25°C	2.7
Color	White
Evaporation @ +200°C, 24 Hours, %/Wt.	0.3
Thermal Conductivity, (ASTM D5470)	
Cal/Sec. Cm. °C	23×10^{-4}
BTU.In/(Hr.Ft ² .°F)	6.9
W/m.°K	1.0
Thermal Resistance ($^{\circ}\text{C}-\text{In}^2/\text{W}$)	0.03

Electrical Properties:

Dielectric Strength (ASTM D150) 0.05" gap, V/mil	350
Dielectric Constant (ASTM D150) +25°C @ 1000Hz	4.65
Dissipation Factor (ASTM D150) +25°C @ 1000Hz	0.0026
Volume Resistivity (ASTM D257) Ohm-cm	1.8×10^{14}
Operating Temperature Range	-55° to +200°C

Typical Applications:

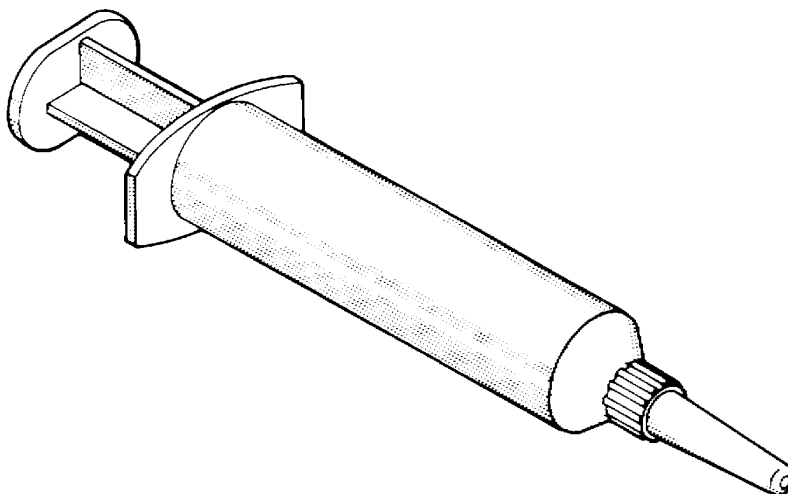
The NTE424 heat sink compound is applied to the base and mounting studs of transistors, diodes and silicon controlled rectifiers (SCRs). In these situations, a small amount of the thermal grease is applied using either the dispensing of screen printing/stencil methods. NTE424 can be used as a high-voltage corona suppressant/non-flammable coating, in connections for flyback transformers located in TV sets and similar design applications. It is also used in mounting semiconductor devices; thermoelectric modules; power transistors and diodes; coupling entire heat generating assemblies to chassis; heat transfer medium on ballasts; thermal joints; thermocouple wells; mounting power resistors; and for any devices where efficient cooling is required in major industries including: electronic (computer, appliance, wire-less, etc.), automotive and electrical.

Shelf-Life:

The NTE424 has a shelf-life of 5 years at room temperature (+25°C) in unopened containers. Slight settling of the filler may occur during long-term storage. In this case, it is recommended to re-disperse the filler by hand or mechanical mixing. Refrigerate material at 0° to +10°C to avoid any settling.

Clean-Up:

Standard approved clean-up and disposal procedures should be followed in every situation. The use of disposable containers and utensils are recommended whenever possible to simplify and expedite clean-up. However, when disposable containers are impractical, NTE424 can be removed by cleaning solvents such as Mineral Spirit (Paint Thinner), Heptane or Isopropyl Alcohol.



MATERIAL SAFETY DATA SHEET

Finished Product



Date-Issued: July, 2005
MSDS Ref. No: NTE424
Date-Revised: 3/19/2007
Revision No: Rev. 2

NTE424 Non-Silicone Heat Sink Compound Product Code 11

I. PRODUCT AND SUPPLIER INFORMATION

PRODUCT NAME: NTE424

MSDS number: NTE424
Publication Date:
Replaces: Rev. 1

Product Synonyms: Non-Silicone Thermal Compound
Chemical family or Formula: Complex Mixture
Marketer: NTE Electronics, Inc.

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Product Information: 973-748-5089
Transportation Emergency: 973-748-5089

Note: The purpose of this MSDS is to provide safe handling, shipping and disposal information for users of the product. It is not intended to, nor does it, provide complete or extensive toxicological data on the product or its components. Users who require this information are referred to primary suppliers of the ingredients of interest.

II. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Component Name</u>	<u>CAS #</u>	<u>Concentration</u>
Poly Synthetic Fluid	Proprietary information	>20%
Zinc Oxide*	1314-13-2	>60%

* Material in non-airborn form

III. HAZARDS IDENTIFICATION

OSHA Hazard Classification:

No warning statements required.

Routes of Entry: Inhalation, skin contact, ingestion

Chemical Interactions: Avoid contact with all oxidizing agents

IV FIRST AID

Inhalation

Remove individual to fresh air. If not breathing, give artificial respiration or oxygen as appropriate. Keep patient warm. Seek immediate medical advice.
Not an expected route of entry. Overexposure may cause irritation of the mucous membranes and respiratory tract.

Skin Contact:

Flush skin thoroughly with soap and water. Rinse thoroughly. Seek medical advice if contact was extensive. Prolonged direct skin contact may cause dermatitis or irritation.

Eyes:

Immediately flush eyes with plenty of water while holding eyelids apart. Seek immediate medical advice.
Overexposure to direct eye contact may cause redness, irritation, discomfort or tearing.

Ingestion:

May produce laxative effect.
Seek immediate medical advice. Never give anything by mouth to an unconscious person.
Symptoms may include: Headache, dizziness, nausea, intestinal disorders and unconsciousness.
Not an expected route of exposure. Ingestion may cause abdominal pains, cramping, nausea or vomiting.

Notes To Physician: Treat symptomatically.

V. FIRE FIGHTING MEASURES

Flammability Summary:

Heavy Grease Flash Point: > 400 F

Fire/Explosion Hazards:

This material is not considered a potential fire and explosion hazard under normal operating conditions.

Extinguishing Media:

Foam, dry chemical, CO₂. Water spray may be used to cool containers.
Do not allow, contaminated water to enter sewers or waterways.

Fire Fighting Instructions:

In case of fire, use normal fire fighting equipment including a NIOSH approved self-contained breathing apparatus (SCBA). Use water to cool containers.

Hazardous Combustion Products:

Oxides of carbon.

1. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:

Evacuate the area of all unnecessary personnel. Eliminate any ignition sources until the area is determined to be free from explosion and fire hazards. Contain the release and eliminate its source if this can be done safely.

Wear protective clothing. Keep unprotected persons away from spill.

Spill Mitigation Procedures

Air Release:

Low volatility makes this hazard unlikely.
Provide adequate ventilation. Keep away from ignition sources

Water Release:

Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Notify all downstream users of possible contamination. Keep away from ignition sources.
Do not flush to sewer! US regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of stipulated quantities. US Coast Guard National Response Center is 800-424-8802.

Spill Mitigation Procedures (Cont'd)

Land Release:

Create a dike or trench to contain materials. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Contain all contaminated water for disposal and/or treatment.

Additional Spill Information:

Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section XIII, Disposal Considerations.

VII HANDLING AND STORAGE

Handling:

Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash with soap and water. Avoid breathing vapor or mist.

Storage

Keep container tightly closed. Store in a cool area away from ignition sources and oxidizers. No special precautions need be taken if product is handled according to directions.

VIII EXPOSURE CONTROLS/ PERSONAL PROTECTION

Ventilation:

Local exhaust ventilation or other engineering controls are normally NOT necessary when handling or using this product. General exhaust ventilation is usually sufficient for general worker safety and comfort.

Explosion proof motors and fans are not required for unheated handling.

Respirator Type(s):

Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.

Skin: Wear impervious gloves (butyl rubber, Viton, e.g.) to avoid skin contact. Follow good industrial hygiene practices.

Eyes: Use chemical safety glasses with side shields, safety goggles and/or a full face shield where splashing is possible.

Protective Clothing Type: Impervious

IX PHYSICAL AND CHEMICAL DATA

Physical State: Heavy grease

Color: White

Odor: Nil

Explosive limits:

No data. Low volatility makes ambient explosive vapor concentrations impossible.

Molecular Weight: Not applicable to mixtures

pH (@ 25 Deg. C): Not applicable

Octanol/Water Coeff: No data

Solubility in Water: negligible

Bulk Density: Not applicable

Specific Gravity (68 Deg.F): 2.7

Vapor Density (Air = 1):

Vapor Pressure: (@ 20 Deg. C):

Evaporation Rate (Estimated):

Flash Point, (Estimated)

Volatiles % by vol.:

Approximate Boiling Point (deg.F):

Drop Point:

No data

< 1

< 1

> 400F

negligible

> 400

None

X STABILITY AND REACTIVITY

Stability and Reactivity Summary:

Stable under normal conditions.

Reactive Properties:

Sensitivity to mechanical shock: None
Hazardous Polymerization: Will not occur
Conditions to Avoid: High temperatures, ignition sources, oxidizing materials.
Chemical Incompatibility: Oxidizers.
Incompatible materials: No data
Hazardous Decomposition Products: CO, CO₂
Decomposition Temperature: No data
Product May Be Unstable At Temperatures Above: No data

XI TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD₅₀ Value: No data
Dermal LD₅₀: No data
Inhalation LC₅₀: No data
Product Animal Toxicity: No data

Skin Irritation:

This material is expected to be slightly irritating to the skin and mucous membranes.

Eye Irritation:

This material is expected to be irritating.

Reproductive and Developmental Toxicity:

No reproductive or developmental risk to humans is expected from exposure to this product.

Component Data:

All data refer to finished product

Mutagenicity:

Not known or reported to be mutagenic.

Carcinogenicity:

This chemical is not known or reported to be carcinogenic by any reference source including IARC, EPA OSHA, NTP, or ACGIH.

XII ECOLOGICAL INFORMATION

Ecological Toxicity Values:

Do not allow this material to be released to the environment without appropriate governmental permits.

Environmental fate: No information found

Environmental Toxicity: No information found

XIII DISPOSAL CONSIDERATIONS

Consult current local, state and national regulations to ensure proper disposal.

Waste Disposal Summary:

Product as made does not qualify as an "Unlisted Hazardous Waste" for disposal situations.

Disposal Methods:

Dispose of in accordance with local, state and federal regulations for hazardous waste.

XIV TRANSPORTATION INFORMATION

Proper Shipping Name, Hazard Class, UN/NA Number Packing Group, Emergency Response Guide Number	Not regulated
Labels required per 49 CFR 172.101:	None
Size for "Limited quantity" per 49 CFR 173.150-.155:	Not applicable
Reportable Quantity ("RQ") per 49 CFR 172.101:	None
Air (IATA/ICAO): Passenger & Cargo:	Not applicable
Eff. Jan 1, 2001 Cargo only:	Not applicable
Special Provisions:	Not applicable
Emergency response Group Code:	Not applicable

XV REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA):

The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.

Superfund Amendments and Reauthorization Act (SARA) Title III:Section 313 – Toxic Chemicals:

Zinc Oxide CAS# 1314-13-2

Safety Phrases:

Keep container tightly closed in a well ventilated area, away from sources of ignition. No smoking.

Do not breathe gas, fumes, vapor or spray from this product.

Do not empty into drains.

State Right-to-Know Regulations Status of Ingredients

Pennsylvania: No information

New Jersey: No information

Massachusetts: No information

Hazard Category Classifications and Ratings

Hazard Categories:	Health	Fire	Pressure	Reactivity	
HMIS Hazard Ratings:	Health 1	Fire 1	Instability 0	Other B (Goggles, gloves)	
NFPA 704 Hazard Ratings:	Health 1	Flammability 1	Reactivity 0	Special N/A	
Hazard Ratings:	Least: 0	Slight: 1	Moderate: 2	High: 3	Extreme: 4

XVI ADDITIONAL INFORMATION

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THE MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. WE BELIEVE THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF ITS PUBLICATION DATE, BUT MAKE NO WARRANTY THAT IT IS. IF THIS MSDS IS MORE THAN THREE YEARS OLD YOU SHOULD CONTACT THE SUPPLIER TO MAKE CERTAIN THAT THE INFORMATION IS CURRENT.

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