

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES:

DBT-BA	MLS	HP2	TOB
DBT-III	MLS-HPC	MHP	TOB-HD
DBT-TOCIII-PT	MLS-NS	ML	TOB-III
DBT-OG	MLS-SF	MWU-III	TOC-500
	MLS-TOC500	TCB-HD	

PRODUCT USE: Conductive Applications

MANUFACTURER:

Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:

(Monday-Friday, 7:00am-4:00pm EST)
803-425-7904

IN CASE OF EMERGENCY CALL:

(24 Hours/Day, 7 Days/Week)
803-425-7918

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A red/orange metal sheet. The only hazards associated with copper foil as shipped are the potential for cuts from sharp edges.

POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
Arsenic	Known carcinogen	1-Carcinogenic to humans	Regulated carcinogen
Chromium	Known carcinogen	3- Not classifiable as to its carcinogenicity to humans	No

a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

b: <https://ntp.niehs.nih.gov/publications/monographs/index.html> last updated 2018

c: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=24730&p_table=INTERPRETATIONS

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.
Arsenic	7440-38-2	<0.05
Chromium	7440-47-3	<0.01
Zinc	7440-66-6	<0.5

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

4. FIRST AID MEASURES

SKIN:	Seek medical attention for cuts.
EYES:	Flush eyes with large amounts of water. Seek medical attention if irritation persists.
INHALATION:	Seek fresh air. Get medical attention if irritation persists.
INGESTION:	Not applicable. Not a probable route of exposure.
ADVICE TO PHYSICIAN:	No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

Safety Data Sheet - Copper Foil

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	0.1 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	None
Arsenic	0.01 mg/m3 TWA	0.01 mg/m3 TWA	None
Chromium	0.5 mg/m3 TWA	1 mg/m3 TWA	None
Zinc	5 mg/m3 TWA	10 mg/m3 TWA	None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.	
PHYSICAL STATE:	Solid	
MOLECULAR WEIGHT:	Not applicable	
CHEMICAL FORMULA:	Not applicable	
ODOR:	Odorless	
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C	
SOLUBILITY IN WATER (weight %):	Insoluble	
pH:	Not applicable	
BOILING POINT:	4652 d F @ 1 atm.	
MELTING POINT:	1083 d C @ 1 atm.	
VAPOR PRESSURE:	Not applicable	
VAPOR DENSITY (air = 1.0):	Not applicable	
EVAPORATION RATE:	Not applicable	COMPARED TO:
% VOLATILES:	Not applicable	
FLASH POINT:	None	

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY
NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable

HAZARDOUS DECOMPOSITION PRODUCTS:

None

HAZARDOUS POLYMERIZATION:

Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Article - Exempt from TSCA**OTHER TSCA ISSUES:** None**SARA TITLE III/CERCLA**

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Copper	5000	None
Arsenic	1	None
Chromium	5000	None
Zinc	1000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

Safety Data Sheet - Copper Foil

SECTION 311 HAZARD CLASS: None

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Copper	None
Arsenic	None
Chromium	None
Zinc	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients listed in this section	N/A	N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE:	October 22, 2020
PREVIOUS ISSUE/REVISION DATE:	March 26, 2020
	December 17, 2019
	July 18, 2017
	February 25, 2015
PREVIOUS ISSUE/REVISION DATE:	May 17, 2013
PREVIOUS ISSUE/REVISION DATE:	November 10, 2006

CHANGES TO SDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Updated "other/generic names" to reflect ingredient names listed in copper foil.

These Changes were made in order to be in compliance with the GHS Haz-Comm Standard.

- Changed Material Safety Data Sheet to read Safety Data Sheet
- Section 2 (COMPOSITION/INFORMATION ON INGREDIENTS) was moved down to section 3, and section 3 (HAZARDS IDENTIFICATION) was moved up to section 2.
- Moved Incompatibles from section 10 to section 7

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Section 1 More comprehensive list of products available included in "other/generic names" for copper foil
- Section 2 Modified nickel weight percent from 0.024 to 0.03 to reflect the same significant figures as the other ingredients
- Section 3 Updated carcinogenic information and cited sources for information; removed zinc from the table since it does not appear on NTP, IARC, or OSHA lists for carcinogenic substances

OTHER INFORMATION: None

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES:

MHT
MHT-DT
MLS-MHT

RLS-SHT
RLS-SHT-RTF

PRODUCT USE: Conductive Applications

MANUFACTURER:

Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:

(Monday-Friday, 7:00am-4:00pm EST)
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IN CASE OF EMERGENCY CALL:

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2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A red/orange metal sheet. The only hazards associated with copper foil as shipped are the potential for cuts from sharp edges.

POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
Arsenic	Known carcinogen	1-Carcinogenic to humans	Regulated carcinogen
Chromium	Known carcinogen	3- Not classifiable as to its carcinogenicity to humans	No
Nickel	Suspect carcinogen	2B-Possibly carcinogenic to humans	No

a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

b: <https://ntp.niehs.nih.gov/publications/monographs/index.html> last updated 2018

c: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=24730&p_table=INTERPRETATIONS

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.
Arsenic	7440-38-2	<0.05
Chromium	7440-47-3	<0.01
Nickel	7440-02-0	<0.03
Zinc	7440-66-6	<0.5

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

4. FIRST AID MEASURES

SKIN:	Seek medical attention for cuts.
EYES:	Flush eyes with large amounts of water. Seek medical attention if irritation persists.
INHALATION:	Seek fresh air. Get medical attention if irritation persists.
INGESTION:	Not applicable. Not a probable route of exposure.
ADVICE TO PHYSICIAN:	No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

Safety Data Sheet - Copper Foil

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	0.1 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	None
Arsenic	0.01 mg/m3 TWA	0.01 mg/m3 TWA	None
Chromium	0.5 mg/m3 TWA	1 mg/m3 TWA	None
Nickel	1 mg/m3 TWA	1 mg/m3 TWA	None
Zinc	5 mg/m3 TWA	10 mg/m3 TWA	None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.	
PHYSICAL STATE:	Solid	
MOLECULAR WEIGHT:	Not applicable	
CHEMICAL FORMULA:	Not applicable	
ODOR:	Odorless	
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C	
SOLUBILITY IN WATER (weight %):	Insoluble	
pH:	Not applicable	
BOILING POINT:	4652 d F @ 1 atm.	
MELTING POINT:	1083 d C @ 1 atm.	
VAPOR PRESSURE:	Not applicable	
VAPOR DENSITY (air = 1.0):	Not applicable	
EVAPORATION RATE:	Not applicable	COMPARED TO:
% VOLATILES:	Not applicable	
FLASH POINT:	None	

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY
NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable

HAZARDOUS DECOMPOSITION PRODUCTS:

None

HAZARDOUS POLYMERIZATION:

Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Article - Exempt from TSCA**OTHER TSCA ISSUES:** None**SARA TITLE III/CERCLA**

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
Copper	5000	None
Arsenic	1	None
Chromium	5000	None
Nickel	100	None
Zinc	1000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

Safety Data Sheet - Copper Foil

SECTION 311 HAZARD CLASS: None

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Copper	None
Arsenic	None
Chromium	None
Nickel	None
Zinc	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients listed in this section	N/A	N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE: October 22, 2020
PREVIOUS ISSUE/REVISION DATE: March 26, 2020
December 17, 2019
July 18, 2017
February 25, 2015
PREVIOUS ISSUE/REVISION DATE: May 17, 2013
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OTHER INFORMATION: None

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES: TLB-DS-AT TLB-PLSP-AT
TLB-SS-AT

PRODUCT USE: Conductive Applications

MANUFACTURER: Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:

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POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
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a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

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3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.

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4. FIRST AID MEASURES

SKIN: Seek medical attention for cuts.

EYES: Flush eyes with large amounts of water. Seek medical attention if irritation persists.

INHALATION: Seek fresh air. Get medical attention if irritation persists.

INGESTION: Not applicable. Not a probable route of exposure.

ADVICE TO PHYSICIAN: No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	0.1 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	None

Safety Data Sheet - Copper Foil

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.	
PHYSICAL STATE:	Solid	
MOLECULAR WEIGHT:	Not applicable	
CHEMICAL FORMULA:	Not applicable	
ODOR:	Odorless	
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C	
SOLUBILITY IN WATER (weight %):	Insoluble	
pH:	Not applicable	
BOILING POINT:	4652 d F @ 1 atm.	
MELTING POINT:	1083 d C @ 1 atm.	
VAPOR PRESSURE:	Not applicable	
VAPOR DENSITY (air = 1.0):	Not applicable	
EVAPORATION RATE:	Not applicable	COMPARED TO:
% VOLATILES:	Not applicable	
FLASH POINT:	None	

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable

HAZARDOUS DECOMPOSITION PRODUCTS:

None

HAZARDOUS POLYMERIZATION:

Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

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14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

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Copper	5000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: None**SARA 313 TOXIC CHEMICALS:**

Safety Data Sheet - Copper Foil

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

INGREDIENT NAME

Copper

COMMENT

None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

INGREDIENT NAME

No ingredients listed in this section

WEIGHT %

N/A

COMMENT

N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE:

October 22, 2020

PREVIOUS ISSUE/REVISION DATE:March 26, 2020
December 17, 2019
July 18, 2017**PREVIOUS ISSUE/REVISION DATE:**

February 25, 2015

PREVIOUS ISSUE/REVISION DATE:May 17, 2013
November 10, 2006**CHANGES TO SDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:**

- Updated "other/generic names" to reflect ingredient names listed in copper foil. These Changes were made in order to be in compliance with the GHS Haz-Comm Standard.
- Changed Material Safety Data Sheet to read Safety Data Sheet
- Section 2 (COMPOSITION/INFORMATION ON INGREDIENTS) was moved down to section 3, and section 3 (HAZARDS IDENTIFICATION) was moved up to section 2.
- Moved Incompatibles from section 10 to section 7

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Section 1 More comprehensive list of products available included in "other/generic names" for copper foil
- Section 2 Modified nickel weight percent from 0.024 to 0.03 to reflect the same significant figures as the other ingredients
- Section 3 Updated carcinogenic information and cited sources for information; removed zinc from the table since it does not appear on NTP, IARC, or OSHA lists for carcinogenic substances

OTHER INFORMATION:

None

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES: TLB-DS TLB-PLSP
TLB-SS

PRODUCT USE: Conductive Applications

MANUFACTURER: Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:

(Monday-Friday, 7:00am-4:00pm EST)
803-425-7904

IN CASE OF EMERGENCY CALL:

(24 Hours/Day, 7 Days/Week)
803-425-7918

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A red/orange metal sheet. The only hazards associated with copper foil as shipped are the potential for cuts from sharp edges.

POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
Chromium	Known carcinogen	3- Not classifiable as to its carcinogenicity to humans	No

a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

b: <https://ntp.niehs.nih.gov/publications/monographs/index.html> last updated 2018

c: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=24730&p_table=INTERPRETATIONS

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.
Chromium	7440-47-3	<0.01

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

4. FIRST AID MEASURES

SKIN:	Seek medical attention for cuts.
EYES:	Flush eyes with large amounts of water. Seek medical attention if irritation persists.
INHALATION:	Seek fresh air. Get medical attention if irritation persists.
INGESTION:	Not applicable. Not a probable route of exposure.
ADVICE TO PHYSICIAN:	No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

Safety Data Sheet - Copper Foil

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	0.1 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	None
Chromium	0.5 mg/m3 TWA	1 mg/m3 TWA	None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.	
PHYSICAL STATE:	Solid	
MOLECULAR WEIGHT:	Not applicable	
CHEMICAL FORMULA:	Not applicable	
ODOR:	Odorless	
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C	
SOLUBILITY IN WATER (weight %):	Insoluble	
pH:	Not applicable	
BOILING POINT:	4652 d F @ 1 atm.	
MELTING POINT:	1083 d C @ 1 atm.	
VAPOR PRESSURE:	Not applicable	
VAPOR DENSITY (air = 1.0):	Not applicable	
EVAPORATION RATE:	Not applicable	COMPARED TO:
% VOLATILES:	Not applicable	
FLASH POINT:	None	

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY
NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable

HAZARDOUS DECOMPOSITION PRODUCTS:

None

HAZARDOUS POLYMERIZATION:

Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Article - Exempt from TSCA**OTHER TSCA ISSUES:** None**SARA TITLE III/CERCLA**

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Copper	5000	None
Chromium	5000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: None

Safety Data Sheet - Copper Foil

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

INGREDIENT NAME

Copper
Chromium

COMMENT

None
None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

INGREDIENT NAME

No ingredients listed in this section

WEIGHT %

N/A

COMMENT

N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE:

October 22, 2020

PREVIOUS ISSUE/REVISION DATE:

March 26, 2020
December 17, 2019
July 18, 2017
February 25, 2015

PREVIOUS ISSUE/REVISION DATE:

May 17, 2013

PREVIOUS ISSUE/REVISION DATE:

November 10, 2006

CHANGES TO SDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Updated "other/generic names" to reflect ingredient names listed in copper foil.

These Changes were made in order to be in compliance with the GHS Haz-Comm Standard.

- Changed Material Safety Data Sheet to read Safety Data Sheet
- Section 2 (COMPOSITION/INFORMATION ON INGREDIENTS) was moved down to section 3, and section 3 (HAZARDS IDENTIFICATION) was moved up to section 2.
- Moved Incompatibles from section 10 to section 7

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Section 1 More comprehensive list of products available included in "other/generic names" for copper foil
- Section 2 Modified nickel weight percent from 0.024 to 0.03 to reflect the same significant figures as the other ingredients
- Section 3 Updated carcinogenic information and cited sources for information; removed zinc from the table since it does not appear on NTP, IARC, or OSHA lists for carcinogenic substances

OTHER INFORMATION:

None

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES:
TOC-III
TOC-III-PT

PRODUCT USE: Conductive Applications

MANUFACTURER:
Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:
(Monday-Friday, 7:00am-4:00pm EST)
803-425-7904

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
803-425-7918

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A red/orange metal sheet. The only hazards associated with copper foil as shipped are the potential for cuts from sharp edges.

POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
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a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

b: <https://ntp.niehs.nih.gov/publications/monographs/index.html> last updated 2018

c: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=24730&p_table=INTERPRETATIONS

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.
Zinc	7440-66-6	<0.5

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

4. FIRST AID MEASURES

SKIN: Seek medical attention for cuts.

EYES: Flush eyes with large amounts of water. Seek medical attention if irritation persists.

INHALATION: Seek fresh air. Get medical attention if irritation persists.

INGESTION: Not applicable. Not a probable route of exposure.

ADVICE TO PHYSICIAN: No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m ³ TWA-fume 1 mg/m ³ TWA-dust/mist	0.1 mg/m ³ TWA-fume 1 mg/m ³ TWA-dust/mist	None
Zinc	5 mg/m ³ TWA	10 mg/m ³ TWA	None

Safety Data Sheet - Copper Foil

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.
PHYSICAL STATE:	Solid
MOLECULAR WEIGHT:	Not applicable
CHEMICAL FORMULA:	Not applicable
ODOR:	Odorless
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C
SOLUBILITY IN WATER (weight %):	Insoluble
pH:	Not applicable
BOILING POINT:	4652 d F @ 1 atm.
MELTING POINT:	1083 d C @ 1 atm.
VAPOR PRESSURE:	Not applicable
VAPOR DENSITY (air = 1.0):	Not applicable
EVAPORATION RATE:	Not applicable
% VOLATILES:	Not applicable
FLASH POINT:	None

COMPARED TO:

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable

HAZARDOUS DECOMPOSITION PRODUCTS:

None

HAZARDOUS POLYMERIZATION:

Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Article - Exempt from TSCA**OTHER TSCA ISSUES:** None**SARA TITLE III/CERCLA**

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Copper	5000	None
Zinc	1000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: None

Safety Data Sheet - Copper Foil

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

INGREDIENT NAME

Copper
Zinc

COMMENT

None
None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

INGREDIENT NAME

No ingredients listed in this section

WEIGHT %

N/A

COMMENT

N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE:

October 22, 2020

PREVIOUS ISSUE/REVISION DATE:

March 26, 2020
December 17, 2019
July 18, 2017
February 25, 2015

PREVIOUS ISSUE/REVISION DATE:

May 17, 2013

PREVIOUS ISSUE/REVISION DATE:

November 10, 2006

CHANGES TO SDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Updated "other/generic names" to reflect ingredient names listed in copper foil.

These Changes were made in order to be in compliance with the GHS Haz-Comm Standard.

- Changed Material Safety Data Sheet to read Safety Data Sheet
- Section 2 (COMPOSITION/INFORMATION ON INGREDIENTS) was moved down to section 3, and section 3 (HAZARDS IDENTIFICATION) was moved up to section 2.
- Moved Incompatibles from section 10 to section 7

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Section 1 More comprehensive list of products available included in "other/generic names" for copper foil
- Section 2 Modified nickel weight percent from 0.024 to 0.03 to reflect the same significant figures as the other ingredients
- Section 3 Updated carcinogenic information and cited sources for information; removed zinc from the table since it does not appear on NTP, IARC, or OSHA lists for carcinogenic substances

OTHER INFORMATION:

None

Safety Data Sheet - Copper Foil

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Copper Foil

OTHER/GENERIC NAMES:

3EC-HTE
PLSP-SF

MLS-3EC-HTE
MLS-TPI

PLSP
PLSP-HD

TOC-HD
TOC-III
TPI

PRODUCT USE: Conductive Applications

MANUFACTURER:

Denkai America, Inc.
29 Battleship Road Extension
Camden, SC 29020

FOR MORE INFORMATION CALL:

(Monday-Friday, 7:00am-4:00pm EST)
803-425-7904

IN CASE OF EMERGENCY CALL:

(24 Hours/Day, 7 Days/Week)
803-425-7918

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: A red/orange metal sheet. The only hazards associated with copper foil as shipped are the potential for cuts from sharp edges.

POTENTIAL HEALTH HAZARDS

Dusts, mists or fumes may be generated when copper foil is cut or processed. (laminated)

SKIN: As produced in foil form, the potential for cuts exists due to sharp edges of the metal.

EYES: Dust may irritate eyes.

INHALATION: Dust may cause irritation to respiratory tract.

INGESTION: Not applicable. Not a probable route of exposure.

DELAYED EFFECTS: No chronic effects are expected from this product.

Safety Data Sheet - Copper Foil

2. HAZARDS IDENTIFICATION (cont)

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS^a</u>	<u>IARC STATUS^b</u>	<u>OSHA LIST^c</u>
Chromium	Known carcinogen	3- Not classifiable as to its carcinogenicity to humans	No

a: <https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html> 14th Report on Carcinogens November 3rd, 2016

b: <https://ntp.niehs.nih.gov/publications/monographs/index.html> last updated 2018

c: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=24730&p_table=INTERPRETATIONS

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Copper	7440-50-8	99.4 min.
Chromium	7440-47-3	<0.01
Zinc	7440-66-6	<0.5

Trace impurities and additional material names not listed above may also appear in Section 15 towards the end of the SDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

4. FIRST AID MEASURES

SKIN:	Seek medical attention for cuts.
EYES:	Flush eyes with large amounts of water. Seek medical attention if irritation persists.
INHALATION:	Seek fresh air. Get medical attention if irritation persists.
INGESTION:	Not applicable. Not a probable route of exposure.
ADVICE TO PHYSICIAN:	No specific advice. Treat according to symptoms present.

Safety Data Sheet - Copper Foil

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	None
FLASH POINT METHOD:	Not applicable.
AUTOIGNITION TEMPERATURE:	Not applicable.
UPPER FLAME LIMIT (volume % in air):	Not applicable.
LOWER FLAME LIMIT (volume % in air):	Not applicable.
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

Water or carbon dioxide as appropriate for surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

None

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.)

As a solid, spills and releases are not a factor. Dust should be swept or vacuumed to reduce airborne dust and particulates.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: Always wear recommended personal protective equipment. Edges of copper foil are sharp. Dyneema® or Kevlar® cut-resistant gloves are recommended for hand protection.

STORAGE RECOMMENDATIONS: No specific storage requirements.

INCOMPATIBLES: 1-bromo-2 propyne

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General exhaust.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION	Dyneema® or Kevlar® cut-resistant gloves.
EYE PROTECTION:	Safety glasses.
RESPIRATORY PROTECTION:	If dust or fume is present, use negative pressure respirator according to NIOSH/MSHA standards.
ADDITIONAL RECOMMENDATIONS:	None

Safety Data Sheet - Copper Foil

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Copper	0.2 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	0.1 mg/m3 TWA-fume 1 mg/m3 TWA-dust/mist	None
Chromium	0.5 mg/m3 TWA	1 mg/m3 TWA	None
Zinc	5 mg/m3 TWA	10 mg/m3 TWA	None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Red/orange metal.	
PHYSICAL STATE:	Solid	
MOLECULAR WEIGHT:	Not applicable	
CHEMICAL FORMULA:	Not applicable	
ODOR:	Odorless	
SPECIFIC GRAVITY (water = 1.0):	8.93 @ 20 d C	
SOLUBILITY IN WATER (weight %):	Insoluble	
pH:	Not applicable	
BOILING POINT:	4652 d F @ 1 atm.	
MELTING POINT:	1083 d C @ 1 atm.	
VAPOR PRESSURE:	Not applicable	
VAPOR DENSITY (air = 1.0):	Not applicable	
EVAPORATION RATE:	Not applicable	COMPARED TO:
% VOLATILES:	Not applicable	
FLASH POINT:	None	

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):
Stable

HAZARDOUS DECOMPOSITION PRODUCTS:
None

HAZARDOUS POLYMERIZATION:
Will not occur

Safety Data Sheet - Copper Foil

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Not applicable in this form

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Not applicable in this form

OTHER DATA:

None

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL CONSIDERATIONS

RCRA**Is the unused product a RCRA hazardous waste if discarded?**

No

If yes, the RCRA ID number is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Copper foil is completely recyclable

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not applicable**US DOT ID NUMBER:** Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)**TSCA INVENTORY STATUS:** Article - Exempt from TSCA**OTHER TSCA ISSUES:** None**SARA TITLE III/CERCLA**

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Copper	5000	None
Chromium	5000	None
Zinc	1000	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800- 424-8802) and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: None

Safety Data Sheet - Copper Foil

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 3.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
Copper	None
Chromium	None
Zinc	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 3, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
No ingredients listed in this section	N/A	N/A

ADDITIONAL REGULATORY INFORMATION:

None

WHMIS CLASSIFICATION (CANADA):

Not applicable - Article

FOREIGN INVENTORY STATUS:

Not applicable – Article

16. OTHER INFORMATION

CURRENT ISSUE/REVISION DATE:	October 22, 2020
PREVIOUS ISSUE/REVISION DATE:	March 26, 2020
	December 17, 2019
	July 18, 2017
	February 25, 2015
PREVIOUS ISSUE/REVISION DATE:	May 17, 2013
PREVIOUS ISSUE/REVISION DATE:	November 10, 2006

CHANGES TO SDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Updated "other/generic names" to reflect ingredient names listed in copper foil.

These Changes were made in order to be in compliance with the GHS Haz-Comm Standard.

- Changed Material Safety Data Sheet to read Safety Data Sheet
- Section 2 (COMPOSITION/INFORMATION ON INGREDIENTS) was moved down to section 3, and section 3 (HAZARDS IDENTIFICATION) was moved up to section 2.
- Moved Incompatibles from section 10 to section 7

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

- Section 1 More comprehensive list of products available included in "other/generic names" for copper foil
- Section 2 Modified nickel weight percent from 0.024 to 0.03 to reflect the same significant figures as the other ingredients
- Section 3 Updated carcinogenic information and cited sources for information; removed zinc from the table since it does not appear on NTP, IARC, or OSHA lists for carcinogenic substances

OTHER INFORMATION: None