1 Identification

- **Product identifier**
  - Trade name: Carbon Conductive Adhesive 502
  - Article number: 12694-30, 12684-30
  - Application of the substance / the mixture: Laboratory chemicals

- **Details of the supplier of the safety data sheet**
  - Manufacturer/Supplier: Electron Microscopy Sciences
    1560 Industry Road
    USA-Hatfield, PA 19440
    Tel: 215-412-8400 Fax: 215-412-8450
    email: sgkck@aol.com
    www.emsdiasum.com
  - Information department: Product safety department
  - Emergency telephone number:
    ChemTrec 1-800-424-9300 Contract CCN7661
    1-703-527-3887

2 Hazard(s) identification

- **Classification of the substance or mixture**
  - GHS02 Flame
    Flammable Liquids 2
    H225 Highly flammable liquid and vapor.
  - GHS08 Health hazard
    Carcinogenicity 2
    H351 Suspected of causing cancer. Route of exposure: Inhalation.
  - GHS07
    Eye Irritation 2A
    H319 Causes serious eye irritation.

- **Label elements**
  - GHS label elements: The product is classified and labeled according to the Globally Harmonized System (GHS).
  - Hazard pictograms
    GHS02  GHS07  GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - METHYL ETHYL KETONE
  - Carbon black

(Contd. on page 2)
· **Hazard statements**
  Highly flammable liquid and vapor.
  Causes serious eye irritation.
  Suspected of causing cancer. Route of exposure: Inhalation.
  May cause drowsiness or dizziness.

· **Precautionary statements**
  Obtain special instructions before use.
  Do not handle until all safety precautions have been read and understood.
  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  Ground/bond container and receiving equipment.
  Use explosion-proof electrical/ventilating/lighting/equipment.
  Use only non-sparking tools.
  Take precautionary measures against static discharge.
  Avoid breathing dust/fume/gas/mist/vapors/spray
  Wash thoroughly after handling.
  Use only outdoors or in a well-ventilated area.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  IF in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  IF exposed or concerned: Get medical advice/attention.
  Call a poison center/doctor if you feel unwell.
  If eye irritation persists: Get medical advice/attention.
  In case of fire: Use CO2, powder or water spray to extinguish.
  Store in a well-ventilated place. Keep container tightly closed.
  Store in a well-ventilated place. Keep cool.
  Store locked up.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
  · **NFPA ratings (scale 0 - 4)**
    
    Health = 2  
    Fire = 3  
    Reactivity = 0  
  
  · **HMIS-ratings (scale 0 - 4)**
    
    HEALTH 2  
    FIRE 9  
    REACTIVITY 0  

· **Other hazards**
  · **Results of PBT and vPvB assessment**
    · **PBT:** Not applicable.
    · **vPvB:** Not applicable.

### 3 Composition/information on ingredients

· **Chemical characterization:** Mixtures
  · **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**
  
<table>
<thead>
<tr>
<th>CAS</th>
<th>Name</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-93-3</td>
<td>METHYL ETHYL KETONE</td>
<td>&gt;50-≤100%</td>
</tr>
</tbody>
</table>
Trade name: Carbon Conductive Adhesive 502

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1333-86-4</td>
<td>Carbon black</td>
<td>&gt;2.5 - ≤10%</td>
</tr>
<tr>
<td>7782-42-5</td>
<td>Graphite</td>
<td>&gt;2.5 - ≤10%</td>
</tr>
</tbody>
</table>

4 First-aid measures

· Description of first aid measures
  · General information:
    Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  · After inhalation: Supply fresh air; consult doctor in case of complaints.
  · After skin contact: Generally the product does not irritate the skin.
  · After eye contact:
    Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
  · After swallowing: Immediately call a doctor.
· Information for doctor:
  · Most important symptoms and effects, both acute and delayed: No further relevant information available.
  · Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents: CO2, sand, extinguishing powder. Do not use water.
  · For safety reasons unsuitable extinguishing agents: Water with full jet
  · Special hazards arising from the substance or mixture: No further relevant information available.
· Advice for firefighters
  · Protective equipment: No special measures required.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
· Environmental precautions:
  Do not allow to enter sewers/surface or ground water.
· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to section 13.
  Ensure adequate ventilation.
  Do not flush with water or aqueous cleansing agents
· Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
· Protective Action Criteria for Chemicals
  · PAC-1:
    | CAS Number | Substance         | Concentration |
    |------------|-------------------|---------------|
    | 78-93-3    | METHYL ETHYL KETONE | 200 ppm       |
    | 1333-86-4  | Carbon black      | 9 mg/m³       |
  · PAC-2:
    | CAS Number | Substance         | Concentration |
    |------------|-------------------|---------------|
    | 78-93-3    | METHYL ETHYL KETONE | 2700* ppm     |
    | 1333-86-4  | Carbon black      | 99 mg/m³      |
Trade name: Carbon Conductive Adhesive 502

7 Handling and storage

· Handling:
  · Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Prevent formation of aerosols.
  · Information about protection against explosions and fires:
    Keep ignition sources away - Do not smoke.
    Protect from heat.
    Protect against electrostatic charges.
· Conditions for safe storage, including any incompatibilities
· Storage:
  · Requirements to be met by storerooms and receptacles: Store in a cool location.
  · Information about storage in one common storage facility: Not required.
  · Further information about storage conditions:
    Keep receptacle tightly sealed.
    Store in cool, dry conditions in well sealed receptacles.
    Protect from heat and direct sunlight.
· Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

· Additional information about design of technical systems: No further data; see section 7.
· Control parameters
  · Components with limit values that require monitoring at the workplace:
    The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.
    At this time, the remaining constituent has no known exposure limits.

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th>78-93-3 METHYL ETHYL KETONE</th>
<th>1333-86-4 Carbon black</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4000* ppm</td>
<td>590 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>78-93-3 METHYL ETHYL KETONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>REL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TLV</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1333-86-4 Carbon black</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>REL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TLV</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Ingredients with biological limit values:

<table>
<thead>
<tr>
<th>BEI</th>
<th>2 mg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium: urine</td>
<td></td>
</tr>
<tr>
<td>Time: end of shift</td>
<td></td>
</tr>
<tr>
<td>Parameter: Methyl ethyl ketone (nonspecific)</td>
<td></td>
</tr>
</tbody>
</table>

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment:

General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.

Breathing equipment:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Penetration time of glove material
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection:

- Tightly sealed goggles

Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

Form: Liquid
Color: Black
Odor: Like ketone
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition

Melting point/Melting range: -86.1 °C (-123 °F)
Boiling point/Boiling range: 80 °C (176 °F)
## 5.6.1.8

- **Flash point:** -5 °C (23 °F)
- **Flammability (solid, gaseous):** Highly flammable.
- **Auto igniting:** 514 °C (957.2 °F)
- **Decomposition temperature:** Not determined.
- **Ignition temperature:** Product is not selfigniting.
- **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** 10 Vol %
- **Vapor pressure at 20 °C (68 °F):** 70 hPa (52.5 mm Hg)
- **Density at 20 °C (68 °F):** 0.869 g/cm³ (7.25181 lbs/gal)
- **Relative density**
- **Vapor density**
- **Evaporation rate**
- **Solubility in / Miscibility with Water:** Not miscible or difficult to mix.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - **Dynamic at 20 °C (68 °F):** 400-800 mPas
  - **Kinematic:** Not determined.
- **Solvent content:**
  - **Organic solvents:** 80.0 %
  - **VOC content:** 80.00 %
  - 695.2 g/l / 5.80 lb/gal
- **Solids content:** 10.0 %
- **Other information** No further relevant information available.

## 10. Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.
11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
  - LD/LC50 values that are relevant for classification:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-93-3</td>
<td>METHYL ETHYL KETONE</td>
<td>3,300 mg/kg (rat)</td>
<td>5,000 mg/kg (rabbit)</td>
</tr>
</tbody>
</table>

- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: Irritating effect.
- Sensitization: No sensitizing effects known.
- Additional toxicological information:
  The product shows the following dangers according to internally approved calculation methods for preparations:
  Harmful
  Irritant

- Carcinogenic categories

<table>
<thead>
<tr>
<th>Agency</th>
<th>CAS Number</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC (International Agency for Research on Cancer)</td>
<td>1333-86-4</td>
<td>2B</td>
</tr>
<tr>
<td>NTP (National Toxicology Program)</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>OSHA-Ca (Occupational Safety Health Administration)</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.
- Other adverse effects: No further relevant information available.

13 Disposal considerations

- Waste treatment methods
- Recommendation:
  Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
## 14 Transport information

| UN-Number | UN1193 |
| UN, ADR, IMDG, IATA | Ethyl methyl ketone |
| UN proper shipping name | 1193 ETHYL METHYL KETONE (METHYL ETHYL KETONE) |
| DOT, IMDG, IATA | ETHYL METHYL KETONE (METHYL ETHYL KETONE) |

### Transport hazard class(es)

- **DOT**
  - Class 3 Flammable liquids
  - Label 3

- **ADR, IMDG, IATA**
  - Class 3 Flammable liquids
  - Label 3

### Packing group

- **DOT, ADR, IMDG, IATA**
  - II

### Environmental hazards:

- Not applicable.

### Special precautions for user

- Warning: Flammable liquids
- Hazard identification number (Kemler code): 33
- EMS Number: F-E,S-E
- Stowage Category B

### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

- Not applicable.

### Transport/Additional information:

#### DOT

- Quantity limitations:
  - On passenger aircraft/rail: 5 L
  - On cargo aircraft only: 60 L

#### ADR

- Excepted quantities (EQ)
  - Code: E2
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 500 ml
Trade name: Carbon Conductive Adhesive 502

- IMDG
- Limited quantities (LQ) 1L
- Exempted quantities (EQ) Code: E2
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 500 ml
- UN "Model Regulation": UN 1193 ETHYL METHYL KETONE (METHYL ETHYL KETONE), 3, II

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  No further relevant information available.
- Sara
  - Section 355 (extremely hazardous substances):
    None of the ingredients is listed.
  - Section 313 (Specific toxic chemical listings):
    None of the ingredients is listed.
- TSCA (Toxic Substances Control Act):
  All components have the value ACTIVE.
- Hazardous Air Pollutants
  None of the ingredients is listed.
- Proposition 65
  - Chemicals known to cause cancer:
    1333-86-4 Carbon black
  - Chemicals known to cause reproductive toxicity for females:
    None of the ingredients is listed.
  - Chemicals known to cause reproductive toxicity for males:
    None of the ingredients is listed.
  - Chemicals known to cause developmental toxicity:
    None of the ingredients is listed.
- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    78-93-3 METHYL ETHYL KETONE 1
  - TLV (Threshold Limit Value)
    1333-86-4 Carbon black A4
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    1333-86-4 Carbon black 4
- GHS label elements
  The product is classified and labeled according to the Globally Harmonized System (GHS).
- Hazard pictograms
  GHS02  GHS07  GHS08
Trade name: Carbon Conductive Adhesive 502

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  METHYL ETHYL KETONE  
  Carbon black

- **Hazard statements**
  Highly flammable liquid and vapor.  
  Causes serious eye irritation.  
  Suspected of causing cancer. Route of exposure: Inhalation.  
  May cause drowsiness or dizziness.

- **Precautionary statements**
  Obtain special instructions before use.  
  Do not handle until all safety precautions have been read and understood.  
  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
  Ground/bond container and receiving equipment.  
  Use explosion-proof electrical/ventilating/lighting/equipment.  
  Use only non-sparking tools.  
  Take precautionary measures against static discharge.  
  Avoid breathing dust/fume/gas/mist/vapors/spray  
  Wash thoroughly after handling.  
  Use only outdoors or in a well-ventilated area.  
  Wear protective gloves/protective clothing/eye protection/face protection.  
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.  
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.  
  Continue rinsing.  
  IF exposed or concerned: Get medical advice/attention.  
  Call a poison center/doctor if you feel unwell.  
  If eye irritation persists: Get medical advice/attention.  
  In case of fire: Use CO2, powder or water spray to extinguish.  
  Store in a well-ventilated place. Keep container tightly closed.  
  Store in a well-ventilated place. Keep cool.  
  Store locked up.  
  Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Chemical safety assessment**: A Chemical Safety Assessment has not been carried out.

---

**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Date of preparation / last revision**: 07/07/2023

- **Abbreviations and acronyms:**
  ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
Trade name: Carbon Conductive Adhesive 502

vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flammable Liquids 2: Flammable liquids – Category 2
Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A
Carcinogenicity 2: Carcinogenicity – Category 2
Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3