1. Identification of the substance/mixture and of the company

- **Product identifier**
  - **Trade name**: 495 PMMA Series Resists in Anisole
  - **Product number**:
    - M130001, M130002, M130003, M130004, M130504, M130005, M130505, M130006, M130007, M130507, M130008, M130508, M130009, M130010, M130011, M130015, M130515
- **Application of the substance / the mixture** Photoresist
- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier**:
    - MicroChem Corp.
    - 200 Flanders Road
    - Westborough, MA 01581 USA
  - **Information department**:
    - Product Safety
    - Email: productsafety@microchem.com
  - **Emergency telephone number**:
    - MicroChem Corp: 617-965-5511
    - Chemtrec USA Emergency: 800-424-9300
    - Chemtrec International Emergency: 703-527-3887

2. Hazard(s) identification

- **Classification of the substance or mixture**
  - **GHS02 Flame**
    - Flam. Liq. 3 H226 Flammable liquid and vapor.
  - **GHS07**
    - Acute Tox. 4 H332 Harmful if inhaled.
    - Skin Irrit. 2 H315 Causes skin irritation.
    - Eye Irrit. 2A H319 Causes serious eye irritation.
    - STOT SE 3 H335 May cause respiratory irritation.

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

- **Signal word**: Warning

- **Hazard-determining components of labeling**:
  - Anisole
  - **Hazard statements**
    - H226 Flammable liquid and vapor.
    - H332 Harmful if inhaled.
    - H315 Causes skin irritation.

(Contd. on page 2)
Trade name: 495 PMMA Series Resists in Anisole

H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

· Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P370+P378 In case of fire: Use for extinction: Alcohol resistant foam.
P370+P378 In case of fire: Use for extinction: Fire-extinguishing powder.
P370+P378 In case of fire: Use for extinction: Carbon dioxide.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
· NFPA ratings (scale 0 - 4)

Health = 1
Fire = 2
Reactivity = 0

· HMIS-ratings (scale 0 - 4)

Health = 1
Fire = 2
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:

| 100-66-3 | Anisole | Flam. Liq. 3, H226; Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335 | 80-100% |

· Additional Components:

| 9011-14-7 | Poly(methyl methacrylate) | 1-20% |

(Contd. on page 3)
4 First-aid measures

· **Description of first aid measures**

· **After inhalation:**
  Inhalation is not an expected route of exposure. If respiratory irritation or distress occurs remove victim to fresh air. Seek medical attention if respiratory irritation or distress continues.

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

· **After eye contact:**
  Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.

· **After swallowing:**
  Do not induce vomiting unless instructed to do so by a physician. Wash out mouth with water and keep person at rest. Seek immediate medical attention.

· **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:**
  Alcohol resistant foam
  Fire-extinguishing powder
  Carbon dioxide

· **For safety reasons unsuitable extinguishing agents:**
  Water with full jet
  Water

· **Special hazards arising from the substance or mixture**
  Containers may explode due to pressure increase when container is exposed to extreme heat. Vapors may travel a considerable distance to a source of ignition and flash back along vapor trail.

· **Advice for firefighters**
  · Personal precautions, protective equipment and emergency procedures
    Wear protective equipment. Keep unprotected persons away.
    Ensure adequate ventilation
    Keep away from ignition sources
  · 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).
    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.
# 7 Handling and storage

- **Handling:**
  - **Precautions for safe handling**
    - Use only under yellow light
    - Keep receptacles tightly sealed.
    - Use only in well ventilated areas.
    - Ensure good ventilation/exhaust at the workplace.
    - Prevent formation of aerosols.
  - **Information about protection against explosions and fires:**
    - Keep ignition sources away - Do not smoke.
    - Use explosion-proof apparatus / fittings and spark-proof tools.
    - Protect against electrostatic charges.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:**
  - **Requirements to be met by storerooms and containers:**
    - Store in inert atmosphere or keep well sealed to prevent the formation of peroxides and other oxidation products.
  - **Information about storage in one common storage facility:** Not required.
  - **Further information about storage conditions:**
    - Keep container tightly sealed.
    - Protect from exposure to the light.
    - Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.

- **Specific end use(s)** Preparation of radiation sensitive layers in fabrication of microelectronic devices

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# 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**
  - The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

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

- **Exposure controls**

- **Personal protective equipment:**
  - **General protective and hygienic measures:**
    - Wash hands before breaks and at the end of work.
    - Keep away from food and beverages.
    - Immediately remove all soiled and contaminated clothing.
    - Avoid contact with the eyes and skin.
  - **Respiratory equipment:** Use suitable respiratory protective device in case of insufficient ventilation.
  - **Protection of hands:**

    ![Protective gloves](image)

    Contact glove manufacturerer for break-through time.

- **Material of gloves**
  - VITON®
  - Nitrile rubber, NBR

- **Penetration time of glove material** Contact glove manufacture for break-through time.
9 Physical and chemical properties

- Information on basic physical and chemical properties
  - General Information
    - Appearance:
      - Form: Liquid
      - Color: Clear to light yellow
    - Odor: Strong
    - Odour threshold: Not determined.
  - pH-value: Not determined.
- Change in condition
  - Melting point/Melting range: Undetermined.
  - Boiling point/Boiling range: 184 °C (363 °F)
- Flash point: 43 °C (109 °F)
- Flammability (solid, gaseous): Not applicable.
- Ignition temperature: 475 °C (887 °F)
- Decomposition temperature: Not determined.
- Auto igniting: 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: Not determined.
- Vapor pressure at 20 °C (68 °F): 0.4 hPa
- Density: Not determined.
- Relative density: See Table 1 Other Information
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with
  - Water: Water miscible No
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity:
  - Dynamic: Not determined.
  - Kinematic: Not determined.
38.0

· Solvent content:
  · VOC content:
  · Other information

See Table 1 below

Table 1. Product specific gravity and VOC data.

<table>
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<th>Name</th>
<th>Number</th>
<th>Sp.Grav.</th>
<th>Vol.(%by wt.)</th>
<th>VOC (g/L)</th>
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</table>

10 Stability and reactivity

· Reactivity
  · Chemical stability Stable under normal use conditions
  · 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: Strong Oxidizing Agents, Strong Acids, Strong Bases
  · Hazardous decomposition products:
    Carbon monoxide and carbon dioxide
    Phenol
    methyl methacrylate

11 Toxicological information

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

<table>
<thead>
<tr>
<th>100-66-3 Anisole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Dermal</td>
</tr>
</tbody>
</table>

· Primary irritant effect:
  · on the skin: Irritant to skin and mucous membranes.
  · on the eye: Irritating effect.
  · Sensitization: No sensitizing effects known.
  · Experience with humans: No further relevant information available.
Trade name: 495 PMMA Series Resists in Anisole

- Additional toxicological information:
  The product shows the following dangers according to internally approved calculation methods for preparations:
  Irritant

- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    9011-14-7 Poly(methyl methacrylate) 3
  - NTP (National Toxicology Program)
    None of the ingredients are listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity:
    100-66-3 Anisole
    EC50/24 h 40 mg/l (daphnia magna)
    EC50/96 hr 162 mg/l (green algae)
    LC50/48 hr 120 mg/L (Cyprinus carpio (common carp))

- 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 2 (Self-assessment): hazardous for water
    Do not allow product to reach ground water, water course or sewage system.
    Danger to drinking water if even small quantities leak into the ground.
  - 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 as regular garbage/trash. Do not allow product to reach sewage system.
    Disposal must be made in accordance with Federal, State, and Local regulations.

- Uncleaned packagings
  - Recommendation:
    Disposal must be made in accordance with Federal, State, and Local regulations.

14 Transport information

- UN-Number
  UN1866

- UN proper shipping name
  RESIN SOLUTION, mixture
### ADR
- **Transport hazard class(es)**
- **DOT**
  
### ADR, IMDG, IATA
- **Class** 3 Flammable liquids.
- **Label** 3

### Packing group
- **DOT, ADR, IMDG, IATA** III

### Environmental hazards:
- **Marine pollutant:** No

### Special precautions for user
- **Danger code (Kemler):** Warning: Flammable liquids
- **EMS Number:** F-E,S-D

### Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- **UN "Model Regulation":** Not applicable.

### UN1866, RESIN SOLUTION, mixture, 3, III

#### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - **Sara**
    - **Section 355 (extremely hazardous substances):**
      - None of the ingredients are listed.
    - **Section 313 (Specific toxic chemical listings):**
      - None of the ingredients is listed.
  - **TSCA (Toxic Substances Control Act):**
    - All ingredients are listed or comply with TSCA regulations.
  - **Proposition 65**
    - **Chemicals known to cause cancer:**
      - None of the ingredients are listed.
    - **Chemicals known to cause reproductive toxicity for females:**
      - None of the ingredients are listed.
Trade name: 495 PMMA Series Resists in Anisole

- Chemicals known to cause reproductive toxicity for males:
  None of the ingredients are listed.

- Chemicals known to cause developmental toxicity:
  None of the ingredients are listed.

- Carcinogenic categories
  - EPA (Environmental Protection Agency)
    None of the ingredients are listed.
  - TLV (Threshold Limit Value established by ACGIH)
    None of the ingredients are listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    None of the ingredients are listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients are listed.

- New Jersey State Right To Know List
  100-66-3 Anisole

- California SCAQMD Rule 443.1 VOC's; See Table 1 - Section 9

- GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).

- Hazard pictograms
  GHS02  GHS07

- Signal word Warning

- Hazard-determining components of labeling:
  Anisole

- Hazard statements
  H226 Flammable liquid and vapor.
  H332 Harmful if ingested.
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H335 May cause respiratory irritation.

- Precautionary statements
  P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P332+P313 If skin irritation occurs: Get medical advice/attention.
  P337+P313 If eye irritation persists: Get medical advice/attention.
  P370+P378 In case of fire: Use for extinction: Alcohol resistant foam.
  P370+P378 In case of fire: Use for extinction: Fire-extinguishing powder.
  P370+P378 In case of fire: Use for extinction: Carbon dioxide.
  P302+P352 IF ON SKIN: Wash with plenty of soap and water.
  P403+P233 Store in a well-ventilated place. Keep container tightly closed.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
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.

- **Department issuing MSDS:** Product safety department
- **Contact:** Mr. Cole
- **Revision History:**
The business address of the manufacturer in Section 1 was updated. The hazard classification and precautionary statements for the mixture in Section 2 were revised. The toxicology data in Sections 11 and 12 were revised.
- **Date of preparation / last revision:** 10/10/2014 / 1
- **Abbreviations and acronyms:**
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  - ICAO: International Civil Aviation Organization
  - ADR: Accord européen sur le transport 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
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - 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