

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier****Trade name:** 495 PMMA Series Resists in Chlorobenzene**Article number:**

M140001, M140002, M140003, M140004, M140005, M140006, M140007, M140507, M140008, M140009, M140010, M140011, M140012

1.2 Relevant identified uses of the substance or mixture and uses advised against**Sector of Use** SU16 Manufacture of computer, electronic and optical products, electrical equipment**Product category** PC30 Photo-chemicals**Application of the substance / the mixture** Photoresist**1.3 Details of the supplier of the safety data sheet****Manufacturer/Supplier:**

Manufacturer:

Kayaku Advanced Materials

200 Flanders Road

Westborough, MA 01581

Telephone: (617) 965-5511

Fax: (617) 965-5818

Importer:

A-Gas Electronic Materials

Unit 3, IO Centre

Swift Valley

Rugby, Warwickshire

CV21 1TW, UK

Tel: +44-0-1788-537535

Fax: +44-0-1788-535835

Website: www.agasem.comEmail: customerservice.em@agas.com**Further information obtainable from:**

Product Safety

Email: productsafety@kayakuAM.com**1.4 Emergency telephone number:**

Kayaku Advanced Materials : 617-965-5511

Chemtrec USA Emergency : 800-424-9300 (24 hr)

Chemtrec International Emergency : 703-527-3887 (24 hr)

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Classification according to Regulation (EC) No 1272/2008**

flame

Flam. Liq. 3

H226 Flammable liquid and vapour.



health hazard

STOT RE 1

H372 Causes damage to organs through prolonged or repeated exposure.

(Contd. on page 2)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 1)



environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.



Acute Tox. 4	H302 Harmful if swallowed.
Acute Tox. 4	H332 Harmful if inhaled.
Skin Irrit. 2	H315 Causes skin irritation.
STOT SE 3	H336 May cause drowsiness or dizziness.

· 2.2 Label elements

· Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the CLP regulation.

· Hazard pictograms



GHS02 GHS07 GHS08 GHS09

· Signal word Danger

· Hazard-determining components of labelling:

Chlorobenzene

· Hazard statements

H226	Flammable liquid and vapour.
H302+H332	Harmful if swallowed or if inhaled.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H372	Causes damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.

· Precautionary statements

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use alcohol resistant foam to extinguish.
P370+P378	In case of fire: Use fire-extinguishing powder to extinguish.
P370+P378	In case of fire: Use carbon dioxide to extinguish.

(Contd. on page 3)

Safety data sheet

according to 1907/2006/EC, Article 31

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Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 2)

P403+P235 Store in a well-ventilated place. Keep cool.





P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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

SECTION 3: Composition/information on ingredients

- **3.2 Chemical characterisation: Mixtures**
- **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**

CAS: 108-90-7	Chlorobenzene	85-100%
EINECS: 203-628-5	 Flam. Liq. 3, H226;  STOT RE 1, H372;  Aquatic Chronic 2, H411;  Acute Tox. 4, H302; Acute Tox. 4, H332; Skin Irrit. 2, H315; STOT SE 3, H336	

· **Additional Components:**

CAS: 9011-14-7	Poly(methyl methacrylate)	1-15%
EC number: 618-466-4		

- **Additional information:** For the wording of the listed hazard phrases refer to section 16.

SECTION 4: First aid measures

- **4.1 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.
 Immediately remove any clothing soiled by the product.
- **After inhalation:**
 Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:**
 Wash eyes immediately with a large amount of water or normal saline, occasionally lifting upper and lower eye lids until no evidence of chemical remains (about 20 minutes). Remove contact lenses if present and easy to remove. Seek immediate medical attention.
- **After swallowing:** Do not induce vomiting; call for medical help immediately.
- **4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed** Treat symptomatically.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
 Alcohol resistant foam
 Fire-extinguishing powder
 Carbon dioxide

(Contd. on page 4)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 3)

· For safety reasons unsuitable extinguishing agents:

Water with full jet

Water

· 5.2 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.

In case of fire, the following can be released:

Hydrogen chloride (HCl)

Phosgene gas

· 5.3 Advice for firefighters**· Protective equipment:** Wear self-contained respiratory protective device.**SECTION 6: Accidental release measures****· 6.1 Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

Keep away from ignition sources.

Ensure adequate ventilation

· 6.2 Environmental precautions:

Inform respective authorities in case of seepage into water course or sewage system.

Do not allow product to reach sewage system or any water course.

· 6.3 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

· 6.4 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.

SECTION 7: Handling and storage**· 7.1 Precautions for safe handling**

Ensure good ventilation/exhaust at the workplace.

Prevent formation of aerosols.

· Information about fire - and explosion protection:

Keep ignition sources away - Do not smoke.

Use explosion-proof apparatus / fittings and spark-proof tools.

Protect against electrostatic charges.

· 7.2 Conditions for safe storage, including any incompatibilities**· Storage:****· Requirements to be met by storerooms and containers:** No special requirements.**· Information about storage in one common storage facility:**

Do not store together with oxidising and acidic materials.

Do not store together with alkalis (caustic solutions).

· Further information about storage conditions:

Store in cool, dry conditions in well sealed containers.

Store in a cool place. Heat will increase pressure and may lead to the receptacle bursting.

Protect from heat and direct sunlight.

Store receptacle in a well ventilated area.

(Contd. on page 5)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

 · 7.3 **Specific end use(s)** No further relevant information available.

(Contd. of page 4)

SECTION 8: Exposure controls/personal protection

 · 8.1 **Control parameters**

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

 · **Ingredients with limit values that require monitoring at the workplace:**
108-90-7 Chlorobenzene

WEL	Short-term value: 3 ppm
	Long-term value: 1 ppm
Sk	

 · **Additional information:** The lists valid during the making were used as basis.

 · 8.2 **Exposure controls**

 · **Personal protective equipment:**

 · **General protective and hygienic measures:**

Keep away from food and beverages.

Immediately remove all soiled and contaminated clothing

Do not inhale gases / fumes / aerosols.

Avoid contact with the eyes and skin.

Wash hands before breaks and at the end of work.

 · **Respiratory protection:**

In case of low exposure use cartridge respirator. In case of intensive or longer exposure use self-contained respiratory protective device.

 · **Protection of hands:**


Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

 · **Material of gloves** Nitrile rubber, NBR

 · **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

SECTION 9: Physical and chemical properties

 · 9.1 **Information on basic physical and chemical properties**

 · **General Information**

 · **Appearance:**

Form:	Liquid
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Colour:	Clear
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Odour:	Mild
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(Contd. on page 6)

Safety data sheet

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Version number 6

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(Contd. of page 5)

· Odour threshold:	Not determined.																																																																						
· pH-value:	Not determined.																																																																						
· Change in condition Melting point/freezing point:	Undetermined.																																																																						
Initial boiling point and boiling range:	132 °C																																																																						
· Flash point:	28 °C																																																																						
· Flammability (solid, gas):	Not applicable.																																																																						
· Ignition temperature:	590 °C																																																																						
· Decomposition temperature:	Not determined.																																																																						
· Auto-ignition temperature:	Product is not selfigniting.																																																																						
· Explosive properties:	Product is not explosive. However, formation of explosive air/vapour mixtures are possible.																																																																						
· Explosion limits: Lower:	1.3 Vol %																																																																						
Upper:	11.0 Vol %																																																																						
· Vapour pressure at 20 °C:	12 hPa																																																																						
· Density:	Not determined																																																																						
· Relative density	See Table 1 Other Information																																																																						
· Vapour density	Not determined.																																																																						
· Evaporation rate	Not determined.																																																																						
· Solubility in / Miscibility with water:	Not miscible or difficult to mix.																																																																						
· Partition coefficient: n-octanol/water:	Not determined.																																																																						
· Viscosity: Dynamic:	Not determined.																																																																						
Kinematic:	Not determined.																																																																						
· 9.2 Other information	<table><tr><td>Name</td><td>Number</td><td>Sp.Grav.</td><td>Vol.(%by wt.)</td><td>VOC (g/L)</td></tr><tr><td>495C1</td><td>M140001</td><td>1.105</td><td>99</td><td>1095</td></tr><tr><td>495C2</td><td>M140002</td><td>1.107</td><td>98</td><td>1085</td></tr><tr><td>495C3</td><td>M140003</td><td>1.109</td><td>97</td><td>1075</td></tr><tr><td>495C4</td><td>M140004</td><td>1.110</td><td>96</td><td>1065</td></tr><tr><td>495C5</td><td>M140005</td><td>1.110</td><td>95</td><td>1055</td></tr><tr><td>495C6</td><td>M140006</td><td>1.111</td><td>94</td><td>1045</td></tr><tr><td>495C7</td><td>M140007</td><td>1.113</td><td>93</td><td>1035</td></tr><tr><td>495C7.5</td><td>M140507</td><td>1.113</td><td>92.5</td><td>1030</td></tr><tr><td>495C8</td><td>M140008</td><td>1.114</td><td>92</td><td>1025</td></tr><tr><td>495C9</td><td>M140009</td><td>1.115</td><td>91</td><td>1015</td></tr><tr><td>495C10</td><td>M140010</td><td>1.116</td><td>90</td><td>1005</td></tr><tr><td>495C11</td><td>M140011</td><td>1.117</td><td>89</td><td>995</td></tr><tr><td>495C12</td><td>M140012</td><td>1.118</td><td>88</td><td>985</td></tr></table>	Name	Number	Sp.Grav.	Vol.(%by wt.)	VOC (g/L)	495C1	M140001	1.105	99	1095	495C2	M140002	1.107	98	1085	495C3	M140003	1.109	97	1075	495C4	M140004	1.110	96	1065	495C5	M140005	1.110	95	1055	495C6	M140006	1.111	94	1045	495C7	M140007	1.113	93	1035	495C7.5	M140507	1.113	92.5	1030	495C8	M140008	1.114	92	1025	495C9	M140009	1.115	91	1015	495C10	M140010	1.116	90	1005	495C11	M140011	1.117	89	995	495C12	M140012	1.118	88	985
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(Contd. on page 7)

Safety data sheet

according to 1907/2006/EC, Article 31

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Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 6)

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid**
 Heat, flames and sparks. Extremes of temperature and direct sunlight.
 Contact with incompatible materials.
- **10.5 Incompatible materials:** Strong Oxidizing Agents, Strong Acids, Strong Bases
- **10.6 Hazardous decomposition products:**
 Carbon monoxide and carbon dioxide
 Hydrogen chloride (HCl)
 Possible traces of Phosgene

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
 - **Acute toxicity**
 Harmful if swallowed or if inhaled.
 - **LD/LC50 values relevant for classification:**
- | 108-90-7 Chlorobenzene | | |
|-------------------------------|------|----------------------|
| Oral | LD50 | 1110 mg/kg (Rat) |
| Dermal | LD50 | >7940 mg/kg (rabbit) |
| Inhalative | LC50 | 13.9 mg/L (Rat) |
- **Primary irritant effect:**
 - **Skin corrosion/irritation**
 Causes skin irritation.
 - **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
 - **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
 - **Additional toxicological information:**
 - **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
 - **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
 - **Carcinogenicity** Based on available data, the classification criteria are not met.
 - **Reproductive toxicity** Based on available data, the classification criteria are not met.
 - **STOT-single exposure**
 May cause drowsiness or dizziness.
 - **STOT-repeated exposure**
 Causes damage to organs through prolonged or repeated exposure.
 - **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

- **12.1 Toxicity**

- **Aquatic toxicity:**

108-90-7 Chlorobenzene

EC50/24 h 4.30-16.00 mg/l (daphnia magna)

(Contd. on page 8)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 7)


EC50/96 hr	12.5 mg/l (algae)
LC100/48 h	0.03-28 mg/l (golden orfe)
LC50/76 h	4.5-7.4 mg/l (Lepomis macrochirus (Bluegill))

- **12.2 Persistence and degradability** Expected to biodegrade
- **12.3 Bioaccumulative potential** Not expected to bioaccumulate.
- **12.4 Mobility in soil** No further relevant information available.
- **Ecotoxicological effects:**
- **Remark:** Toxic for fish
- **Additional ecological information:**
- **General notes:**
 Water hazard class 2 (German Regulation) (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.
 Also poisonous for fish and plankton in water bodies.
 Toxic for aquatic organisms
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**
 Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

SECTION 14: Transport information

- | | |
|---|---|
| · 14.1 UN-Number
· ADR, IMDG, IATA | UN1866 |
| · 14.2 UN proper shipping name
· ADR, IATA
· IMDG | RESIN SOLUTION
RESIN SOLUTION (CHLOROBENZENE), MARINE
POLLUTANT |
| · 14.3 Transport hazard class(es)
· ADR, IMDG, IATA | |
|  | |
| · Class
· Label | 3 Flammable liquids.
3 |

(Contd. on page 9)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 8)

· 14.4 Packing group · ADR, IMDG, IATA	III
· 14.5 Environmental hazards: · Marine pollutant:	Product contains environmentally hazardous substances: Chlorobenzene Yes
· 14.6 Special precautions for user · Hazard identification number (Kemler code): · EMS Number: · Segregation groups	Warning: Flammable liquids. 30 F-E,S-D Liquid halogenated hydrocarbons
· 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable.
· Transport/Additional information:	
· ADR · Limited quantities (LQ) · Transport category · Tunnel restriction code	5L 3 D/E
· UN "Model Regulation":	UN1866, RESIN SOLUTION, 3, III

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- Directive 2012/18/EU
- Qualifying quantity (tonnes) for the application of lower-tier requirements 200 t
- Qualifying quantity (tonnes) for the application of upper-tier requirements 500 t
- **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 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.

- **Relevant phrases**
H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H332 Harmful if inhaled.
H336 May cause drowsiness or dizziness.
H372 Causes damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.
- **Department issuing SDS:** Product safety department
- **Contact:** Tom Cole, EHS Manager (tcole@kayakuAM.com)
- **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 Organisation
ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)

(Contd. on page 10)

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 01.02.2022

Version number 6

Revision: 01.02.2022

Trade name: 495 PMMA Series Resists in Chlorobenzene

(Contd. of page 9)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

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)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Flam. Liq. 3: Flammable liquids – Category 3

Acute Tox. 4: Acute toxicity – Category 4

Skin Irrit. 2: Skin corrosion/irritation – Category 2

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1

Aquatic Chronic 2: Hazardous to the aquatic environment - long-term aquatic hazard – Category 2

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