



# MATERIAL SAFETY DATA SHEET

FILE NO.: M2V2  
MSDS DATE: 05/26/2009  
MSDS No.: M1052609

## Product: M1

### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: M1 Methacrylate Adhesive, Part A  
PRODUCT CODES: M1ML50, M1ML250  
COMPANY NAME: SmartAdhesives LLC  
ADDRESS: San Francisco, CA 94129

EMERGENCY PHONE: Chemtrec: 1-800-424-9300

PRODUCT USE: Part A of two part Methacrylate adhesive; Industrial use  
ISSUE DATE: 5-26-2009

### SECTION 2: INGREDIENTS

<u>INGREDIENT:</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
Methyl Methacrylate	80-62-6	60-90%
Methacrylic Acid	79-41-4	1-10%
Cumene hydroperoxide	80-15-9	0.1-<1%
P-Toluene sulfonyl chloride	98-59-9	1-<5%

### SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Normal physical form - liquid

#### IMMEDIATE HEALTH AND ENVIRONMENTAL HAZARDS

Highly flammable, may cause sensitization by skin contact, irritating to respiratory system and skin

### SECTION 4: FIRST AID MEASURES

GENERAL INFORMATION: Avoid contact with skin and eyes. Do not breath vapors/spray. In case of accident or if you feel unwell, seek medical advice immediately.

EYE CONTACT: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Contact physician if irritation persists.

SKIN CONTACT: Remove affected person from source of contamination. Wash skin thoroughly with soap and water for several minutes. Contact physician if irritation persists.

INHALATION: Move the exposed person to fresh air at once. When breathing is difficult, properly trained personnel may assist affected person by administering 100% oxygen. Contact physician if discomfort continues.

INGESTION: Do not induce vomiting unless instructed to do so by a physician. Give victim 2 glasses of water. Get medical attention immediately. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

#### NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:

### SECTION 5: FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Extinguish with foam, carbon dioxide or dry powder.

**FIRE FIGHTERS PROTECTION**

**SPECIAL FIRE FIGHTING PROCEDURES:**

Keep up-wind to avoid fumes. Avoid water in straight hose stream; will scatter and spread fire. Cool containers exposed to flames with water until well after the fire is out. Keep run-off water out of sewers and water sources. Dike for water control.

**SPECIFIC HAZARDS:**

Highly flammable, avoid breathing fire vapors. May travel considerable distance to source of ignition and flash back. Polymerizes, generating heat.

**PROTECTIVE MEASURES:**

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**ACCIDENTAL RELEASE MEASURES:**

**PERSONAL PRECAUTIONS**

Warn everybody of potential hazards and evacuate if necessary. Provide adequate ventilation. Remove sources of ignition. Avoid inhalation of spray mist and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

**ENVIRONMENTAL PRECAUTIONS**

Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

**SPILL CLEAN UP METHODS**

Absorb spillage with non-combustible, absorbent material. Transfer to a container for disposal (RCRA hazardous waste). Containers with collected spillage must be properly labeled with correct contents and hazard symbol.

**SECTION 7: HANDLING AND STORAGE**

**HANDLING:**

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Avoid inhalation of vapors/spray and contact with skin and eyes. Take precautionary measures against static discharges. Storage tanks and other containers must be grounded. Do not handle near open flames or near other sources of ignition. Observe good industrial hygiene practices.

**STORAGE:**

Store in tightly closed original container in a cool, dry well-ventilated place. Store in accordance with NFPA regulations. Maintain air space in storage containers.

**SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PROCESS CONDITIONS:**

Provide eyewash, quick drench.

**VENTILATION:**

Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

**RESPIRATORY PROTECTION:**

If ventilation is insufficient, suitable respiratory protection must be provided.

**EYE PROTECTION:**

Wear approved, tight fitting safety glasses where splashing is probable.

**SKIN PROTECTION:**

Protection suit must be worn. Use protective gloves made of rubber or plastic.

**HYGIENE MEASURES:**

Keep away from food, drink and animal feeding stuffs. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Do not eat, drink or smoke when using the product. Change work clothing daily before leaving work place.

**EXPOSURE GUIDELINES:**

	Std	LT - ppm	LT - mg/m3	ST - ppm	ST - mg/m3
Methyl Methacrylate	OES	50 ppm	208 mg/m3	100 ppm	416 mg/m3
Methacrylic Acid	OES	20 ppm	72 mg/m3	40 ppm	143 mg/m3

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

<b>COLOR &amp; APPEARANCE:</b>	White/Off-white Paste	<b>VAPOR PRESSURE (mmHg):</b>	28 mmHg @ 20°C
<b>ODOR:</b>	Pungent odor	<b>VAPOR DENSITY (AIR=1):</b>	3.5 (MDI)
<b>PHYSICAL FORM:</b>	Liquid/Paste	<b>SPECIFIC GRAVITY (H2O=1):</b>	0.96 @ 20°C
<b>pH AS SUPPLIED:</b>	3.0-3.5 (5% diluted solution)	<b>EVAPORATION RATE:</b>	3 (butyl acetate=1)
<b>BOILING POINT:</b>	101°C	<b>FLASH POINT:</b>	10°C
<b>MELTING POINT:</b>	Not applicable	<b>FLAMMABILITY LIMIT:</b>	2.1 lower (%)
<b>FREEZING POINT:</b>	Not applicable	<b>FLAMMABILITY LIMIT:</b>	12.5 upper (%)
		<b>VISCOSITY:</b>	40,000-60,000 cP

**NOTE:** These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guarantee analysis of any specific lot or as specifications for the product.

**SECTION 10: STABILITY AND REACTIVITY**

**STABILITY:** Product is stable under normal temperature conditions and recommended use. Product may polymerize.

**MATERIAL AND CONDITIONS TO AVOID (STABILITY):**

Heating will generate vapors which may form explosive vapor/air mixtures. Avoid heat, flames, and other sources of ignition. Avoid excessive heat for prolonged periods of time. Avoid exposure to high temperatures or direct sunlight.

Avoid contact with oxidizing agents.

**HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:**

<u>SUBSTANCE</u>	<u>CONDITION</u>
Nitrous gases (N Ox)	During combustion
Cyanides	During combustion

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

**HAZARDOUS POLYMERIZATION:** May polymerize.

**SECTION 11: TOXICOLOGICAL INFORMATION**

**TOXICOLOGICAL INFORMATION**

**NAME:** Methyl Methacrylate  
 Toxic Dose 1 - LD50 7872 mg/Kg (oral Rat)  
 Toxic Conc. - LC50 7093 ppm/4h (inh-Rat)

**INHALATION:** In high concentrations, vapors are narcotic and may cause headache, fatigue, dizziness and nausea. In high concentrations, vapors are anesthetic and may cause headache, fatigue, dizziness and central nervous system effects.

**INGESTION:** Irritating. May cause nausea, stomach pain and vomiting.

**SKIN CONTACT:** May be absorbed through the skin, irritating to skin. Prolonged or repeated exposure may cause sever irritation. May cause sensitization to the skin through direct contact. Risk of sensitization or allergic reactions among sensitive individuals.

**EYE CONTACT:** Can be irritating to the eyes. Risk of corneal damage.

**TARGET ORGANS:** Prolonged or repeated exposure may cause damage to the liver and kidneys, respiratory system, lungs, and central nervous system.

**SECTION 12: ECOLOGICAL INFORMATION**

**ECOLOGICAL INFORMATION:**

ECOTOXICITY: Avoid release to environment.  
 MOBILITY: Do not discharge into drains, water courses or onto the ground.  
 DEGRADABILITY: Methyl methacrylate monomer: Biochemical oxygen demand within 5 days (BOD5) = .14g/g - 0.9 g/g.  
 WATER HAZARD CLASSIFICATION: WGK 1 WGH Nr: 1252

**SECTION 13: DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**WASTE CLASS:** 08 04 09

**NOTE:** Please consult applicable regulations or authorities before disposal.

**SECTION 14: TRANSPORT INFORMATION**

**GROUND TRANSPORTATION**



**PROPER SHIPPING NAME:** Adhesives.  
**UK ROAD CLASS:** 3  
**UN NO. ROAD:** 1133  
**ADR CLASS NO.:** 3  
**ADR PACK GROUP:** 3  
**ADR LABEL NO.:** 3  
**HAZARD CLASS:** Flammable Liquid  
**ADR HAZARD NO.:** 30  
**PACKING GROUP:** PG III  
**HAZCHEM CODE:** 3Y  
**CEFIC TEC(R) NO.:** 30GF1-III, 30GF1-sp  
**CLASS NO:** 3 RID  
**PACK GROUP:** III RID

**WATER TRANSPORTATION**

**UN NO. SEA:** 1133  
**IMDG CLASS:** 3  
**IMDG PAGE NO.:** 3  
**IMDG PACK GROUP:** 3  
**EMS:** F-E, S-D  
**MARINE POLLUTANT:** No

**AIR TRANSPORTATION**

**ICAO CLASS:** 3  
**HAZARD CLASS:** 3  
**UN NUMBER:** 1133  
**PACKING GROUP:** III

**SECTION 15: REGULATORY INFORMATION**

**LABELING**



Irritant



Highly Flammable

CONTAINS: METHYL METHACRYLATE  
METHACRYLIC ACID

RISK PHRASES:  
R11 Highly flammable.  
R43 May cause sensitization by skin contact.  
R37/38 Irritating to respiratory system and skin.

SAFETY PHRASES  
S2 Keep out of the reach of children  
S9 Keep container in a well-ventilated place.  
S16 Keep away from sources of ignition - No smoking.  
S29 Do not empty into drains.  
S33 Take precautionary measures against static discharges.

**SECTION 16: OTHER INFORMATION**

**OTHER INFORMATION:**

**DISCLAIMER:** The material in this Material Safety Data Sheet (MSDS) is, to the best of our knowledge, accurate as of the date issued. However, neither SmartAdhesives nor any of its subsidiaries or agents assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that may exist. Given the quantity of variables that affect use and application of our products, many of which are within the user's control and unique to each user's knowledge, SMARTADHESIVES MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE.

**SECTION 1: PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME:** M1 Methacrylate Adhesive, Part B  
**PRODUCT CODES:** M1ML50, M1ML250

**COMPANY NAME:** SmartAdhesives LLC  
**ADDRESS:** San Francisco, CA 94129

**EMERGENCY PHONE:** Chemtrec: 1-800-424-9300

**PRODUCT USE:** Part B of two part Methacrylate adhesive; Industrial use  
**ISSUE DATE:** 5-26-2009

**SECTION 2: INGREDIENTS**

<u>INGREDIENT:</u>	<u>C.A.S. No.</u>	<u>% by Wt.</u>
METHYL METHACRYLATE	80-62-6	60-100%
3,5-Diethyl-1,2-dihydro-1-phenyl--2-propylpyridin	34562-31-7	1-5%

**SECTION 3: HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW:** Normal physical form - liquid

**IMMEDIATE HEALTH AND ENVIRONMENTAL HAZARDS**

Highly flammable, may cause sensitization by skin contact, irritating to respiratory system and skin.

**SECTION 4: FIRST AID MEASURES**

**GENERAL INFORMATION:** Avoid contact with skin and eyes. Do not breath vapors/spray. In case of accident or if you feel unwell, seek medical advice immediately.

**EYE CONTACT:** Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Contact physician if irritation persists.

**SKIN CONTACT:** Remove affected person from source of contamination. Wash skin thoroughly with soap and water for several minutes. Contact physician if irritation persists.

**INHALATION:** Move the exposed person to fresh air at once. When breathing is difficult, properly trained personnel may assist affected person by administering 100% oxygen. Contact physician if discomfort continues.

**INGESTION:** Do not induce vomiting unless instructed to do so by a physician. Give victim 2 glasses of water. Get medical attention immediately. **DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.**

**NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:**

**SECTION 5: FIRE FIGHTING MEASURES**

**EXTINGUISHING MEDIA:** Extinguish with foam, carbon dioxide or dry powder.

**FIRE FIGHTERS PROTECTION**

**SPECIAL FIRE FIGHTING PROCEDURES:**

Keep up-wind to avoid fumes. Avoid water in straight hose stream; will scatter and spread fire. Cool containers exposed to flames with water until well after the fire is out. Keep run-off water out of sewers and water sources. Dike for water control.

**SPECIFIC HAZARDS:** Highly flammable, avoid breathing fire vapors. May travel considerable distance to source of ignition and flash back. Polymerizes, generating heat.

**PROTECTIVE MEASURES:**  
Self contained breathing apparatus and full protective clothing must be worn in case of fire.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**ACCIDENTAL RELEASE MEASURES:  
PERSONAL PRECAUTIONS**

Warn everybody of potential hazards and evacuate if necessary. Provide adequate ventilation. Remove sources of ignition. Avoid inhalation of spray mist and contact with skin and eyes. Wear protective clothing as described in Section 8 of this safety data sheet.

**ENVIRONMENTAL PRECAUTIONS**

Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be IMMEDIATELY alerted to the Environmental Agency or other appropriate regulatory body.

**SPILL CLEAN UP METHODS**

Absorb spillage with non-combustible, absorbent material. Transfer to a container for disposal (RCRA hazardous waste). Containers with collected spillage must be properly labeled with correct contents and hazard symbol.

**SECTION 7: HANDLING AND STORAGE**

**HANDLING:** Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Avoid inhalation of vapors/spray and contact with skin and eyes. Take precautionary measures against static discharges. Storage tanks and other containers must be grounded. Do not handle near open flames or near other sources of ignition. Observe good industrial hygiene practices.

**STORAGE:** Store in tightly closed original container in a cool, dry well-ventilated place. Store in accordance with NFPA regulations.

**SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

**PROCESS CONDITIONS:** Provide eyewash, quick drench.

**VENTILATION:** Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded.

**RESPIRATORY PROTECTION:** If ventilation is insufficient, suitable respiratory protection must be provided.

**EYE PROTECTION:** Wear approved, tight fitting safety glasses where splashing is probable.

**SKIN PROTECTION:** Protection suit must be worn. Use protective gloves made of rubber or plastic.

**HYGIENE MEASURES:** Keep away from food, drink and animal feeding stuffs. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Do not eat, drink or smoke when using the product. Change work clothing daily before leaving work place.

**EXPOSURE GUIDELINES:**

	Std	LT - ppm	LT - mg/m3	ST - ppm	ST - mg/m3
Methyl Methacrylate	OES	50 ppm	208 mg/m3	100 ppm	416 mg/m3

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

<b>COLOR &amp; APPEARANCE:</b>	Yellow Paste	<b>VAPOR PRESSURE (mmHg):</b>	28 mmHg @ 20°C
<b>ODOR:</b>	Pungent odor	<b>VAPOR DENSITY (AIR=1):</b>	3.5 (MDI)
<b>PHYSICAL FORM:</b>	Liquid/Paste	<b>SPECIFIC GRAVITY (H2O=1):</b>	0.96 @ 20°C

<b>pH AS SUPPLIED:</b>	4.5-5.5 (5% diluted solution)	<b>EVAPORATION RATE:</b>	3 (butyl acetate=1)
<b>BOILING POINT:</b>	101°C	<b>FLASH POINT:</b>	10°C
<b>MELTING POINT:</b>	Not applicable	<b>FLAMMABILITY LIMIT:</b>	2.1 lower (%)
<b>FREEZING POINT:</b>	Not applicable	<b>FLAMMABILITY LIMIT:</b>	12.5 upper (%)
		<b>VISCOSITY:</b>	40,000-60,000 cP

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## SECTION 10: STABILITY AND REACTIVITY

**STABILITY:** Product is stable under normal temperature conditions and recommended use. Product may polymerize.

### MATERIAL AND CONDITIONS TO AVOID (STABILITY):

Heating will generate vapors which may form explosive vapor/air mixtures. Avoid heat, flames, and other sources of ignition. Avoid excessive heat for prolonged periods of time. Avoid exposure to high temperatures or direct sunlight.

Avoid contact with oxidizing agents.

### HAZARDOUS DECOMPOSITION OR BY-PRODUCTS:

<u>SUBSTANCE</u>	<u>CONDITION</u>
Nitrous gases (NOx)	During combustion
Cyanides	During combustion

Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapors.

**HAZARDOUS POLYMERIZATION:** May polymerize.

## SECTION 11: TOXICOLOGICAL INFORMATION

### TOXICOLOGICAL INFORMATION

**NAME:**

Methyl Methacrylate

Toxic Dose 1 - LD50 7872 mg/Kg (oral Rat)

Toxic Conc. LC50 7093 ppm/4h (inh-Rat)

**INHALATION:**

In high concentrations, vapors are narcotic and may cause headache, fatigue, dizziness and nausea. In high concentrations, vapors are anesthetic and may cause headache, fatigue, dizziness and central nervous system effects.

**INGESTION:**

Irritating. May cause nausea, stomach pain and vomiting.

**SKIN CONTACT:**

May be absorbed through the skin, irritating to skin. Prolonged or repeated exposure may cause severe irritation. May cause sensitization to the skin through direct contact. Risk of sensitization or allergic reactions among sensitive individuals.

**EYE CONTACT:**

Can be irritating to the eyes. Risk of corneal damage.

**TARGET ORGANS:**

Prolonged or repeated exposure may cause damage to the liver and kidneys, respiratory system, lungs, and central nervous system.

## SECTION 12: ECOLOGICAL INFORMATION

### ECOLOGICAL INFORMATION:

**ECOTOXICITY:** Avoid release to environment.

**MOBILITY:** Do not discharge into drains, water courses or onto the ground.

**DEGRADABILITY:** Methyl methacrylate monomer: Biochemical oxygen demand within 5 days (BOD5) = .14g/g - 0.9 g/g.

**WATER HAZARD CLASSIFICATION:**

WGK 1 WGH Nr: 1252

**SECTION 13: DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL METHOD:** Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**WASTE CLASS:** 08 04 09

**NOTE:** Please consult applicable regulations or authorities before disposal.

**SECTION 14: TRANSPORT INFORMATION**

**GROUND TRANSPORTATION**



**PROPER SHIPPING NAME:** Adhesives.  
**UK ROAD CLASS:** 3  
**UN NO. ROAD:** 1133  
**ADR CLASS NO.:** 3  
**ADR PACK GROUP:** 3  
**ADR LABEL NO.:** 3  
**HAZARD CLASS:** Flammable Liquid  
**ADR HAZARD NO.:** 30  
**PACKING GROUP:** PG III  
**HAZCHEM CODE:** 3Y  
**CEFIC TEC(R) NO.:** 30GF1-III, 30GF1-sp  
**CLASS NO:** 3 RID  
**PACK GROUP:** III RID

**WATER TRANSPORTATION**

**UN NO. SEA:** 1133  
**IMDG CLASS:** 3  
**IMDG PAGE NO.:** 3  
**IMDG PACK GROUP:** 3  
**EMS:** F-E, S-D  
**MARINE POLLUTANT:** No

**AIR TRANSPORTATION**

**ICAO CLASS:** 3  
**HAZARD CLASS:** 3  
**UN NUMBER:** 1133  
**PACKING GROUP:** III

**SECTION 15: REGULATORY INFORMATION**

**LABELLING**



Irritant



Highly Flammable

**CONTAINS:** METHYL METHACRYLATE

**RISK PHRASES:**

R11 Highly flammable.  
 R43 May cause sensitization by skin contact.  
 R37/38 Irritating to respiratory system and skin.

**SAFETY PHRASES**

S2 Keep out of the reach of children

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S9	Keep container in a well-ventilated place.
S16	Keep away from sources of ignition - No smoking.
S29	Do not empty into drains.
S33	Take precautionary measures against static discharges.

**SECTION 16: OTHER INFORMATION****OTHER INFORMATION:**

**DISCLAIMER:** The material in this Material Safety Data Sheet (MSDS) is, to the best of our knowledge, accurate as of the date issued. However, neither SmartAdhesives nor any of its subsidiaries or agents assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that may exist. Given the quantity of variables that affect use and application of our products, many of which are within the user's control and unique to each user's knowledge, SMARTADHESIVES MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE.