

Section 1: Product Information

Name:	MR-4 Part A
Description:	Polyester resin solution
Use:	PVC-to-Glass bonding (Part A & Part B)
MSDS number:	YHAI-20
Appearance and odor:	Blue liquid, sweet odor
Emergency telephone:	1-800-424-9300 CHEMTREC
Product information:	859-879-2853
Effective date:	8/1/2008
Supersedes date:	5/25/2008

Section 2: Hazardous Ingredients

A hazard evaluation of this product has been performed. The components listed below are identified as hazardous chemicals under the criteria of the OSHA hazard communication standard (29 CFR 1910.1200).

<u>Common name / Chemical name</u>	<u>CAS number</u>	<u>Approximate %</u>
Toluene	108-88-3	40 - 50
Ethyl acetate/Acetic acid ethyl ester	141-78-6	30 - 60
Aluminum Triphosphate / Triphosphoric acid, aluminum salt	13939-25-8	1-5
Zinc oxide	1314-13-2	1-5

Section 3: Emergency and First Aid Procedure

Eye contact:
Immediately flush eyes with water for at least 15 minutes. Lift upper and lower eyelids frequently. Get immediate medical attention.

Skin contact:
Remove contaminated clothing and shoes. Wash affected area with soap and water. If irritation develops, consult a physician. Wash contaminated clothing separately before reuse.

Inhalation:
Remove to fresh air. If symptoms develop, seek immediate medical attention. If not breathing, give artificial respiration, preferably mouth to mouth.

Ingestion:
Seek medical attention. Unless advised otherwise, induce vomiting by either giving syrup of ipecac followed by 2 glasses of water or by sticking finger down throat. Do not give anything by mouth if the person is drowsy, unconscious, or has no gag reflex.
Ingestion creates a high risk of aspiration and subsequent chemical pneumonitis. However, the presence of aromatic and/or chlorinated hydrocarbons makes evacuation of the stomach advisable.

Note to physician:
Treatment should be directed at preventing absorption, administering to the symptoms as they occur, and providing supportive therapy.

Section 4: Health Effects Summary			
Primary route(s) of exposure:	Eye - yes	Skin - yes	Inhalation - yes
Eye contact:			
Can cause injury (i.e., burns) to the cornea and other tissues.			
Corneal opacification and vascularization can occur.			
Vapors and/or mists can cause mild to moderate irritation.			
The severity of reaction depends on duration of exposure and first aid procedures administered.			
Skin contact:			
Can cause mild to moderate irritation.			
Prolonged or repeated contact can defat the skin, cause irritation, and lead to the development of dermatitis.			
Can be absorbed through the skin.			
Inhalation:			
Can cause irritation to the nose, throat, and upper respiratory tract.			
Inhalation can cause dizziness, headaches, and incoordination.			
Nausea, vomiting, and gastrointestinal upset can occur.			
Ingestion:			
Ingestion can cause gastrointestinal irritation.			
Can cause nausea, vomiting, and gastrointestinal upset.			
Dizziness, faintness, drowsiness, and incoordination (ataxia) can occur.			
Additional effects (target organs):			
Liver.			
Kidney.			
Central and/or peripheral nervous system.			
Blood and/or hematopoietic system.			
Respirator system.			
Skin.			
Aggravation of existing conditions:			
Liver.			
Kidney.			
Nervous system (central and/or peripheral).			
Blood and/or hematopoietic system.			
Respiratory system.			
Skin.			

Section 5: Toxicological Information			
Toluene			
<i>Toxic effects:</i>			
Eye contact can produce irritation; possibly corneal burns. Skin contact can cause irritation, defatting of the skin and dermatitis. Ingestion can produce central nervous system depression. Large doses can produce metabolic acidosis, liver and kidney damage, ventricular irregularities and convulsions. Inhalation of vapors produces upper respiratory tract irritation, CNS depression. Liver and kidney damage has been reported after exposure to high vapor concentrations. Toluene has also been shown to induce cardiac sensitization.			
<i>Acute toxicity studies:</i>			
Oral-rat	LD50:	5000 mg/kg	
Dermal-rabbit	LD50:	12,124 mg/kg	
Inhalation-mouse	LC50:	5320 ppm/8-hours	

Section 6: Occupational Control Procedures**Eye protection:**

Wear chemical splash goggles.

An eye wash facility should be readily available.

Skin protection:

Wear protective clothing and appropriate impervious gloves. Because a variety of protective gloves exist, always consult glove manufacturer to determine the proper type for specific operation.

Respiratory protection:

Avoid breathing vapor and/or mist.

When established airborne exposure limits are surpassed (see airborne exposure limits in this section), wear NIOSH/MSHA approved equipment. Determine the appropriate type equipment for specific application by consulting the respirator manufacturer. Observe the respirator use limitations specified by NIOSH/MSHA or the manufacturer.

High airborne concentrations may necessitate the use of self-contained breathing apparatus (SCBA) or a supplied air respirator. In addition, respiratory protection programs must be in compliance with 29 CFR 1910.134.

Ventilation:

Maintain airborne concentration below the established exposure limits (See airborne exposure limits in this section) by providing adequate ventilation. Local exhaust ventilation is recommended when vapors, mists, or dusts can be released.

Personal hygiene:

Wash thoroughly after handling, especially before eating, drinking, smoking, or using restroom facilities.

Wash contaminated goggles, faceshield, and gloves. Professionally launder contaminated clothing. Discard contaminated shoes.

Airborne exposure limits**Toluene**

ACGIH TLV-TWA:	50 ppm	188 mg/m ³	skin
STEL:	NE ppm		
OSHA PEL:	100 ppm	375 mg/m ³	
STEL:	150 ppm	560 mg/m ³	

Ethyl acetate

ACGIH TLV-TWA:	400 ppm	1440 mg/m ³
OSHA PEL:	400 ppm	1400 mg/m ³

Aluminum Triphosphate

ACGIH TLV-TWA:	not established
OSHA PEL:	not established

Zinc oxide

ACGIH TLV-TWA:	5 mg/m ³	
STEL:	10 mg/m ³	
OSHA PEL:	5 mg/m ³	
STEL:	10 mg/m ³	
OSHA: Zinc oxide dust - respirable fraction:	5 mg/m ³ ; total dust:	10 mg/m ³ ;
ACGIH:	dust - 10 mg/m ³	

Note: Aluminum Triphosphate and Zinc Oxide are not in the powder form in this product, therefore, the airborne exposure limits may not apply.

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Section 7: Fire Protection Information	
Flash point:	25oF, -4oC Test method: setaflash closed cup
Explosive limits:	LEL (%) - 2.2 UEL (%) - 11.0
Auto-ignition temperature:	800oF, 427oC
Extinguishing media:	
<i>Small fires</i> : use agents approved for class B hazards (e.g. dry chemical, carbon dioxide, halon, foam, steam) or water fog.	
<i>Large fires</i> : use water spray, fog, or alcohol foam.	
Special fire fighting procedures:	
Fire fighters and others who may be exposed to the products of combustion should be equipped with NIOSH approved positive pressure self-contained breathing apparatus (SCBA) and full protective clothing.	
Unusual fire and explosion hazards:	
When exposed to flames or high temperatures encountered during fire conditions, sealed containers may rupture because of the build up of internal pressure. Cool containers with water.	
Vapors may be heavier than air and may travel considerable distances from the material handling point.	
Vapors can be ignited by a spark, flame, cigarette, electric motor, static discharge, engine, pilot light, hot surface, or other ignition source.	

Section 8: Reactivity Data	
Stable under normal conditions of storage and use:	yes
Materials to avoid:	
Amines.	
Oxidizing agents.	
Acids.	
Strong bases.	
Water.	
Hazardous polymerization:	
Hazardous polymerization will not occur.	
Thermal decomposition products:	
If heated to high temperatures, this product may emit the following compounds:	
Flammable solvent vapors.	
Smoke, soot, & toxic fumes (e.g. carbon dioxide & carbon monoxide).	

Section 9: Spill and Leak Procedures	
Response to spills:	
Stop discharge, if it can be performed safely, and contain material or combustible (see section 7). Use an absorbent such as fuller's earth, clay, or other appropriate synthetic absorbent. Place contaminated material in a suitable container for disposal. Appropriate safety measures and protective equipment should be used (see section 6).	
Do not flush to streams, rivers, or other bodies of water.	
Precautions:	
Eliminate all sources of ignition.	
If the airborne concentration exceeds estat (TLV or PEL), or if high airborne concentrations can occur, evacuate employees and ventilate the area.	
A supplied air respirator or self-contained breathing apparatus (SCBA), should be used for entry into enclosed spaces, or in areas with inadequate ventilation.	

Continued on next page

5

Disposal methods:

If discarded in its original unused form, this product exhibits the characteristics of a RCRA hazardous waste as defined under:

40 CFR 261.21 (i.e. ignitable - D001)

Therefore, it must be managed (stored/ treated/disposed/etc.) at a properly permitted facility, in compliance with all applicable federal, state, and local requirements. Be sure to contact the appropriate government environmental agencies if further guidance is required.

It is recommended that an alternative be selected according to the waste management hierarchy.

Section 10:**Special Precautions****Recommended storage practice and conditions:**

Store in cool, dry, well ventilated are. Do not store near heat or ignition sources, or in direct sunlight. Always keep containers tightly closed to avoid contamination.

Special warning: Hot organic chemical vapors or mists can suddenly and without warning combust when mixed with air. Ignition can occur at typical elevated temperature process conditions. Any proposed use in such processes should be evaluated thoroughly to assure safe operating conditions.

Do not store above: 100oF, 38oC

Container use procedures:

Containers should be supported and grounded before opening, dispensing, mixing, pouring, and emptying. Open with no-sparking tools. If the container is warm, open bung slowly to release internal pressure.

Empty container precautions:

This container is hazardous when empty. Do not use heat, sparks, open flames, torches, or cigarettes on or near empty container. Empty containers can retain product residues. Do not reuse empty container for food, clothing, or products for human or animal consumption or where skin contact may occur.

Supplemental section 10 information:

HMIS classification - health: 2*; flammability: 3; reactivity: 0.

* = Chronic effects

Section 11:**Physical Data**

% non-volatile (by weight):	19.6
pH:	not applicable
Vapor density (air=1):	not established
Solubility in water:	insoluble
Evaporation rate (n-butyl acetate=1):	not established
Vapor pressure (mmHg @25oC):	not established
Specific gravity (water=1);	0.96
Approximate boiling point:	not established
Supplemental section 11 information:	VOC = not established

Note: The physical data presented above are typical values and should not be construed as a specification.

Section 12:**Label and Transportation Information**

DOT shipping name:	Resin Solution
DOT label:	Flammable liquid
DOT identification No.:	UN 1866
<i>Supplemental section 12 information:</i>	
Hazard class:	3 (IATA, HM-181), 3.2 (IMO); packing group: "; emergency response guide No.: 26
All shipping information applies to HM-181, IATA/ICAO, IMO.	

Continued on next page

6

Section 13: Regulatory Information

Toxic substance control act (TSCA)

Chemical component(s) in this product are on the section 8
710).

(b) chemical substance inventory listing (40 CFR

SARA title III information

Section 313 - toxic chemicals

Pursuant to section 313, this product contains one or more toxic chemicals that are present in excess of 1 percent of the mixture (0.1 percent, if the listed toxic chemical is a carcinogen).

Toluene

Zinc oxide

Section 302 - extremely hazardous substances

Pursuant to section 302, this product does not contain an extremely hazardous substance.

Section 311/312 - hazard categories

Pursuant to section 311/312, the physical and health hazard categories for this product are identified below:

Fire hazard: yes

Sudden release of pressure hazard: no

Reactivity hazard: no

Immediate (acute) health hazard: yes

Delayed (chronic) health hazard: yes

Hazardous materials information review regulation - Canada

This material safety data sheet provides information that complies with the requirements set forth under the Canadian workplace hazardous materials information system (WHMIS).

Claim for exemption registry No.: not applicable

Expiration date: not applicable

Continued on next page

7

Section 14:**Users Responsibility**

A bulletin such as this cannot be expected to cover all possible individual situations. As the user has the responsibility to provide a safe workplace, all aspects of an individual operation should be examined to determine if, or where, precautions - in addition to those described herein - are required. Any health hazard and safety information contained herein should be passed on to your customers or employees, as the case may be.

Disclaimer of liability

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. Final determination of suitability of the chemical is the sole responsibility of the user. No representations of warranties, either expressed or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the chemical to which the information refers. It is the responsibility of the user to comply with all applicable federal, state and local laws and regulations.

If you have questions with regard to health effects, or other information presented in this document, contact:

Neil Dalton

Director of Environment, Health and Safety

Yokohama Tire Corporation

1500 Indiana Avenue

Salem, VA 24153

Tel.) 540-375-8209

Fax.) 540-375-0226

End of MSDS

8

State of California Addendum to the Material Safety Data Sheet

Product name: **MR-4 Part A**

Effective date: 8/1/2008

The California safe drinking water and toxic enforcement act of 1986, otherwise known as proposition 65, requires that persons potentially exposed to certain substances be made aware of the chronic effects of the substances specified by the state of California.

This product contains the following substances known to the state of California to cause cancer, birth defects, or other reproductive harm.

Ingredients

Toluene

Benzene (trace levels)

Antimony Oxide (trace levels)

End of MSDS

9

Commonwealth of Pennsylvania Addendum to the Material Safety Data Sheet

Product name: **MR-4 Part A**
Effective date: **8/1/2008**

All of the materials in this product that are required by the Commonwealth of Pennsylvania to be identified are listed below. In addition, some of the materials identified may have been placed by the Commonwealth of Pennsylvania on their hazardous substance list.

<u>Ingredients</u>	<u>CAS Number</u>	<u>Weight %</u>
Toluene	108-88-3	40 - 50
Ethyl acetate / Acetic acid ethyl ester	141-78-6	30 - 60
Non-hazardous trade secret ingredient(s)	Proprietary **	10-30
Aluminum triphosphate /	13939-25-8	1-5
Triphosphoric acid, aluminum salt		
Zinc oxide	1314-13-2	1-5

*** The specific chemical identity of any substance not identified with a chemical abstract service number is being held as a trade secret.*