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TO: ATTN: KLEIN JOHNSON
UNIV. OF MINNISOTA
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OLIN CORPORATION
Material Safety Data Sheet

11/29/94

FOR FURTHER INFORMATION (OTHER THAN EMERGENCIES) CALL:

(203) 356-3449

Product Name: ~~QZ 3290~~ ADHESION SOLVENT
Product Code: JPE850951
MSDS Number : JPE01472.0001

OCEAN NETWORK EMERGENCY PHONE 1-800-OLIN-911

This Material Safety Data Sheet (MSDS) has been prepared in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. This product may be considered to be a hazardous chemical under that standard. (Refer to the OSHA classification in SEC. I.) This information is required to be disclosed for safety in the workplace. The exposure to the community, if any, is quite different.

I. PRODUCT IDENTIFICATION

REVISION NUMBER : 01
REVISION DATE : 01/27/94
MSDS FILE NUMBER: JPE01472.0001
PRODUCT CODE : 850951
MSDS NAME : QZ 3290 ADHESION SOLVENT

SYNONYMS: None

CHEMICAL FAMILY: Alcohol

FORMULA: Not Applicable/Mixture

USE DESCRIPTION: Polyimide ancillary

OSHA HAZARD CLASSIFICATION: Flammable liquid; skin, eye and respiratory irritant; nervous system and liver toxin

II. COMPONENT-DATA

PRODUCT COMPOSITION

CAS or CHEMICAL NAME: Ethanol
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CAS NUMBER: 64-17-5
PERCENTAGE RANGE: 90-99%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)
	ppm mg/cubic-meter
TWA:	1000
CEILING:	None
STEL:	None

	ACGIH(TLV)
	ppm mg/cubic-meter
	None
	None
	None

CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: 1-10%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS:

III. SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.

STORAGE CONDITIONS:

STORE IN A COOL, DRY, WELL VENTILATED PLACE.
DO NOT STORE AT TEMPERATURES ABOVE: 25 Deg.C (77 Deg.F)
NOTES: Material is a flammable liquid. Outside or detached storage is preferable. Inside storage should be in a standard flammable liquids storage room or cabinet.

PRODUCT STABILITY AND COMPATIBILITY

(SHELF LIFE LIMITATIONS: 3 years
(INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: See Section VII.
"Incompatible Materials".

IV. PHYSICAL DATA

APPEARANCE: Colorless liquid with characteristic odor
FREEZING POINT: No Data
BOILING POINT: 78 Deg.C (172 Deg.F)
DECOMPOSITION TEMPERATURE: No Data
SPECIFIC GRAVITY: Approximately 0.8 (Water = 1)
BULK DENSITY: 0.8 (g/cc)
pH @ 25 DEG.C: Not Applicable
VAPOR PRESSURE @ 20 DEG.C: 44 mm Hg
SOLUBILITY IN WATER: Miscible
VOLATILES, PERCENT BY VOLUME: 100%
EVAPORATION RATE: 7 (Butyl acetate = 1)
VAPOR DENSITY: 1.6 (Air = 1)
MOLECULAR WEIGHT: Not Applicable/Mixture
ODOR: Characteristic
COEFFICIENT OF OIL/WATER DISTRIBUTION: No Data

V. PERSONAL PROTECTIVE EQUIP

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION:

If air concentrations above the TLV are possible, wear a NIOSH/MSHA approved respirator.

VENTILATION:

Use explosion-proof local exhaust ventilation to maintain levels to
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below the TLV.

SKIN AND EYE PROTECTIVE EQUIPMENT:

Use chemical goggles and impermeable gloves.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NIOSH/MSHA approved organic vapor respirator
PROTECTIVE CLOTHING TYPE (This includes: gloves, boots, apron,
protective suit): Butyl rubber

VI. FIRE & EXPLOSION HAZARDS

FLAMMABILITY DATA:

EXPLOSIVE: No

FLAMMABLE: Yes

COMBUSTIBLE: Not Applicable

PYROPHORIC: No

FLASH POINT: 10-13 Deg.C (50-55 Deg.F) Test Method: Tag closed cup

AUTOIGNITION TEMPERATURE: No Data

FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT
VOLUME IN AIR) LEL - 3.3% UEL - 19.0%

NFPA RATINGS:

Health: 0

Flammability: 3

Reactivity: 0

HMIS RATINGS:

Health: 2

Flammability: 3

Reactivity: 0

EXTINGUISHING MEDIA:

Carbon dioxide, dry chemical, water spray

FIRE FIGHTING TECHNIQUES AND COMMENTS:

Use water to cool containers exposed to fire.

See Section XI for protective equipment for fire fighting.

VII. REACTIVITY

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:

TEMPERATURES ABOVE: 40 Deg.C (104 Deg.F)

MECHANICAL SHOCK OR IMPACT: No

ELECTRICAL (STATIC) DISCHARGE: Yes

HAZARDOUS POLYMERIZATION: Will not occur

INCOMPATIBLE MATERIALS: Strong oxidizers, inorganic acids

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide,
aldehydes

OTHER CONDITIONS TO AVOID: Ignition sources, excess heat

SUMMARY OF REACTIVITY:

EXPLOSIVE: No

OXIDIZER: No

PYROPHORIC: No

ORGANIC PEROXIDE: No
WATER REACTIVE: No

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VIII. FIRST AID

EYES:

Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.

SKIN:

Immediately flush with water for 15 minutes. Wash the contaminated skin with soap and water. If irritation develops, call a physician. If clothing comes in contact with the product, the clothing should be laundered before re use.

INGESTION:

Immediately drink large quantities of water. Induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

INHALATION:

If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough product to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

IX. TOXICOLOGY & HEALTH

ROUTES OF ABSORPTION

Inhalation, ingestion, skin and eye contact

WARNING STATEMENTS AND WARNING PROPERTIES

MAY BE HARMFUL IF SWALLOWED. CAUSES SKIN, EYE, AND MUCOUS MEMBRANE IRRITATION. DO NOT INHALE MIST OR VAPORS. INHALATION MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE RESPIRATORY IRRITATION.

HUMAN THRESHOLD RESPONSE DATA

ODOR THRESHOLD: The odor threshold of ethanol is 84 ppm (geometric average)

IRRITATION THRESHOLD: No Data

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: The IDLH concentration has not been established for this product.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE

INHALATION

ACUTE:

If inhaled, irritation may result to the nose, throat, and respiratory tract. Any irritation would be transient with no permanent damage expected. Inhalation of high concentrations may be narcotic and may cause CNS depression with symptoms including headache, breathing

difficulty, dizziness, drowsiness, loss of coordination, weakness, nausea, and vomiting.

CHRONIC:

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No effects would be expected except for those listed under acute inhalation exposure.

SKIN

ACUTE:

Skin contact may cause irritation consisting of transient redness. This irritant effect would not result in permanent damage.

CHRONIC:

Repeated or prolonged contact may cause a defatting action on the skin leading to dermatitis.

EYE

Exposure to vapors of ethyl alcohol at sufficiently high concentrations may cause immediate stinging and watering of the eyes. There are no reports of eye injury from industrial exposure to ethanol vapors.

Splash contact of ethyl alcohol with the eye causes immediate stinging and burning. Reflex closure of the eyelids and tearing occurs. Transitory injury of the corneal epithelium may occur along with reversible redness (bloodshot eyes) and swelling of the conjunctiva. A foreign-body type of discomfort may be experienced for a day or two, but usually healing is spontaneous and complete.

INGESTION

ACUTE:

Ingestion may cause irritation to the throat, esophagus and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy, or diarrhea. Ingestion may cause CNS depression with symptoms similar to those listed under acute inhalation exposure.

CHRONIC:

There are no known or reported effects from chronic ingestion of this product. It would be expected to cause more serious CNS effects if repeatedly ingested. Prolonged repeated ingestion of ethanol in excessive amounts can cause liver injury.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Exposure may aggravate an existing dermatitis. Persons with a history of liver impairment may be at increased risk from exposure to ethanol.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

Ethanol potentiates the hepatotoxic effects of haloalkanes such as carbon tetrachloride and chloroform.

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

Inhalation LC 50: 20,000 ppm/10 hrs (rat)
Dermal LD 50: Believed to be > 5 g/kg (rabbit)
Oral LD 50: 7.06 g/kg (rat)
Irritation: Irritant to skin and eyes

ACUTE TARGET ORGAN TOXICITY:

Irritation to skin, eyes, lungs and mucous membranes. Inhalation may cause CNS depression and narcotic effects at high exposure concentrations.

CHRONIC TARGET ORGAN TOXICITY:

Prolonged or repeated skin contact may cause dermatitis. Prolonged
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repeated ingestion of ethanol in excessive amounts can cause liver injury.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:

Ingestion of ethanol has been reported to cause effects on the developing fetus.

CARCINOGENICITY:

This product is not known or reported to be carcinogenic by OSHA or NTP. IARC has classified ethyl alcohol as having inadequate evidence for carcinogenicity to laboratory animals. EPA has classified ethyl alcohol as having negative evidence for carcinogenicity in mice and limited evidence for carcinogenicity in rats.

MUTAGENICITY:

Ethyl alcohol has been tested in a battery of mutagenicity and genotoxicity assays. It has been shown to be non-mutagenic in the Ames assay, in several mammalian cell systems and in in vivo genotoxicity assays. It has been shown to be positive in the rodent dominant lethal assay. The weight of evidence suggests that ethyl alcohol is not a mutagenic or genotoxic hazard.

AQUATIC TOXICITY:

Ethanol:

The threshold concentration for immobilization of *Daphnia magna* after a 32 hour exposure in Lake Erie water is 18,400 mg/l. The 6 hour LC for goldfish is 250 mg/l in fresh water. The 6-11 hour LC for *Carassius carassius* is 250 mg/l in distilled water. For grudgeon, the lethal range is reported to be between 7000 and 9000 mg/l in fresh water. The toxicity threshold for *Scenedesmus quadricauda* (green algae) is 5000 mg/l.

X. TRANSPORTATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:

LAND (U.S. DOT): ETHANOL SOLUTION, 3, UN1170, PG II

WATER (IMO): ETHANOL SOLUTION, 3.2, UN1170, PG II

AIR (IATA/ICAO): SAME AS LAND

HAZARD LABEL/PLACARD: FLAMMABLE LIQUID

REPORTABLE QUANTITY: NOT APPLICABLE (Per 49 CFR 172.101, Appendix)

EMERGENCY GUIDE NO: 26

XI. SPILL & LEAKAGE

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY: (Per 40 CFR 302.4) Not Applicable

SPILL MITIGATION PROCEDURES:

Evacuation procedures must be placed into effect. Evacuate all non-essential personnel. Hazardous concentrations in air may be found

in local spill area and immediately downwind. Utilize emergency response personal protective equipment prior to the start of any response. This product may represent an explosion hazard when in the form of vapors in a closed area. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

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form of vapors in a closed area. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

AIR RELEASE: Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

WATER RELEASE: This material is lighter than and miscible with water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Continue to handle as described in land spill.

LAND SPILL: Create a dike or trench to contain materials. Spill materials may be absorbed using sand, clay pads, or non-combustible commercial absorbent. Do not place spill materials back in their original containers. Containerize and label all spill materials properly. Decontaminate all clothing and the spill area using a soap solution and flush with large amounts of water.

SPILL RESIDUES:

Dispose of per guidelines under Section XII. WASTE DISPOSAL.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE FIGHTING SITUATIONS: Additional respiratory protection is necessary when a spill or fire involving this product occurs. You are recommended to use a NIOSH/MSHA approved positive pressure supplied-air respirator.

Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to: boots, gloves, (see below for compatible materials) and splash-proof goggles.

Compatible material for response to this product is butyl rubber.

Protection concerns must also address the potential of the physical characteristic of this product as flammable

XII. WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D001.

If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH

ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING
TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

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XIII ADDITIONAL REG STATUS

TOXIC SUBSTANCES CONTROL ACT:

The components of this product are listed on the Toxic Substance
Control Act inventory

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III: HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH:

Immediate (Acute)

Delayed (Chronic)

PHYSICAL:

Fire

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A: EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

None Established

XIV ADDITIONAL INFORMATION

No Additional Information

XV MAJOR REFERENCES

1. ACGIH Guide to Protective Clothing. Cincinnati, OH: American Conference of Government Industrial Hygienists, 1987.
2. ANSI Z88.2. Recommended Practice for Respiratory Protection. American National Standards Institute, New York, NY.
3. Baker, C. J., The Fire Fighter's Handbook of Hazardous Materials, 4th Ed., Indiana: Maltese Enterprises, Inc., 1984.
4. Bretherick, L., Handbook of Reactive Chemical Hazards, 3rd Ed., Boston, MA: Butterworths, 1985.
5. Casarett, L. and J. Doull, Eds., Toxicology: The Basic Science of Poisons, 3rd Ed., New York: Macmillan Publishing Co., Inc. 1986.
6. CERIS (Chemical Emergency Response Information System) On Line Database. Association of American Railroads.
7. Chemical Degradation and Permeation Database and Selection Guide for Resistant Protective Materials. Austin, TX.
8. Clayton, G. and F. Clayton, Eds., Patty's Industrial Hygiene and Toxicology, Vol. 2A-C 3rd Ed., New York: John Wiley & Sons, 1981-1982.
9. Code of Federal Regulations, Titles 21, 29, 40 and 49. Washington, DC: U.S. Government Printing Office.
10. Ellenhorn, Matthew J. and Donald G. Barceloux, Medical Toxicology: Diagnosis and Treatment of Human Poisoning, Elsevier Science Publishing Co., Inc., N.Y., N.Y., c. 1988.
11. Fire Protection Guide on Hazardous Materials, 10th Ed., National Fire Protection Association, Batterymarch Park, Quincy, MA, 1991.
12. Gosselin, R., et al., Gosselin-Clinical Toxicology of Commercial Products, 5th Ed., Baltimore: Williams and Wilkins, 1984.
13. Grant, W. Morton, M.D., Toxicology of the Eye, 2nd Ed., Springfield, IL: Charles C. Thomas, 1974.
14. Hazardline, Occupational Health Services Inc., New York, NY.

15. IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man. Geneva: World Health Organization, International Agency for Research on Cancer.

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16. Lenga, R., The Sigma-Aldrich Library of Chemical Safety Data, 1st Ed., Milwaukee, WI: Sigma-Aldrich Corporation, 1985.
17. Lewis, R. and D. Sweet, Eds., Registry of Toxic Effects of Chemical Substances, 1985-1986, Washington, DC: U.S. Government Printing Office, 1987.
18. Medline, U.S. National Library of Medicine, Bethesda, MD.
19. McKee, Jack E. and Harold W. Wolf, Eds., Water Quality Criteria, NTIS PB Report, (PB-82-188244), 2nd Ed., Springfield, VA: National Technical Information Services, 1963.
20. NIOSH Pocket Guide to Chemical Hazards, Washington, DC: U.S. Government Printing Office, 1990.
21. Olin Respiratory Protection Manual.
22. Sax, N. Irving, Dangerous Properties of Hazardous Materials 6th Ed., New York: Van Nostrand Reinhold Company, 1984.
23. Threshold Limit Values and Biological Exposure Indices for 1993-94, Cincinnati, OH: American Conference of Government Industrial Hygienists, 1993.
24. Toxic Substances Control Act Inventory, Washington, DC: U.S. Government Printing Office, 1986.
25. Nelson, B.K., et al., Teratological Assessment of Methanol and Ethanol at High Inhalation Levels in Rats, Fundamental and Applied Toxicology, Vol. 5, pp. 727-736, 1985.
26. McCann, Joyce, et al., Detection of Carcinogens as Mutagens in the Salmonella/Microsome test: Assay of 300 Chemicals, Proc. Nat. Acad. Sci. USA, Vol. 72, No. 12, pp. 5135-5139, December 1975.
27. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Ed., Noyes Publications, Park Ridge, NJ, 1985.
28. Randall, Carrie, L. and W.J. Taylor, Prenatal Ethanol Exposure in Mice: Teratogenic Effects, Teratology, Vol. 19, pp. 305-312, 1979.
29. DeFlora, Silvio, et al., Genotoxic activity and Potency of 135 Compounds in the Ames Reversion Test and in Bacterial DNA-Repair Test, Mutation Research, Vol. 133, pp. 161-198, 1984.
30. Sigh, Sant, P., and Ann K. Snyder, Ethanol Ingestion During Pregnancy: Effects on Pregnant Rats and Their Offspring, Journal of Nutrition, Vol. 112, pp. 98-103, 1982.
31. Bringmann, G., and R. Kunh, Comparison of the Toxicity Thresholds of Water Pollutants to Bacteria, Algae and Protozoa in the Cell Multiplication Inhibition Test, Water Research, Vol. 14, pp. 231-241, 1980.
32. Amore, John E. and Earl Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatiles for 214 Industrial Chemicals in Air and Water Dilution, Journal of Applied Toxicology, Vol. 3, No. 6, pp. 272-290, 1983.
33. ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices, Sixth Edition, American Conference of Governmental Hygienists, Inc., Cincinnati, OH, 1991.

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. OLIN BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT OLIN AT THE PHONE NUMBER LISTED BELOW TO

OLIN CORP DATA CNTR
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