Arch Chemicals, Inc.

MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24HOURS/ 7 DAYS:	**1-800-654-6911**
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC(R):	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **QZ 3322**

I. PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE:	09-27-2001
SUPERCEDES:	07-10-2001
MSDS NO:	01457-0006 - 850962
SYNONYMS:	92-888, LMB 4234, XB 4234
CHEMICAL FAMILY:	Stripper, solvent
DESCRIPTION / USE:	Manufacture of microelectronic devices
FORMULA:	Not applicable/Mixture

Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

II. COMPOSITION/INFORMATION ON INGREDIENTS

CAS or CHEMICAL NAME	CAS #	% Range
Ethanolamine	141-43-5	75 - 85
2-Furanmethanol, tetrahydro-	97-99-4	15 - 25

III. HAZARDS IDENTIFICATION

OSHA Hazard Classification: central nervous system depressant, reproductive toxin, corrosive to eyes, corrosive to skin, corrosive to mucous membranes, skin hazard, eye hazard, lung toxin, liver toxin, kidney toxin, combustible liquid

Routes of Entry:	Inhalation, skin, eyes, ingestion
Chemical Interactions:	Mixture with nitrites can form nitrosamines which have caused cancer in laboratory animals.
Medical Conditions Aggravated:	Respiratory diseases including asthma and bronchitis, Pre-existing liver diseases, Pre-existing kidney disease

Human Threshold Response Data

Odor Threshold:	
Ethanolamine	2.6 ppm
Irritation Threshold:	
Ethanolamine	> 5.0 ppm

Hazardous Materials Identification System/National Fire Protection Association Classifications

Hazard Ratings:	Health	Flammability	Reactivity
HMIS	3	2	0
NFPA	Not established		

Immediate (Acute) Health Effects

Inhalation Toxicity:	Moderately toxic by inhalation. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.
Inhalation Irritation:	Inhalation of this material may produce severe irritating and/or corrosive effects to the nose, mouth, throat, and respiratory tract. It may cause burns which can result in symptoms which may include coughing, wheezing, choking, shortness of breath, chest pain, and impairment of lung function.
Skin Contact:	Dermal exposure can cause severe irritation and/or burns characterized by redness, swelling, and scab formation. Prolonged skin exposure may cause permanent damage.
Skin Absorption:	May be absorbed through skin, but it is unlikely that harmful effects will occur unless contact is prolonged, repeated, and extensive.
Eye Contact	Corrosive. Burns can occur following exposure. Direct contact may cause impairment of vision, corneal damage and/or blindness. Rinsing of the eye should take place immediately. No corneal involvement or visual impairment is expected.
Ingestion Irritation:	Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration or perforation. Aspiration may lead to lung damage.
Ingestion Toxicity:	Slightly toxic if swallowed.

AcuteTarget Organ Toxicity: Eyes, Skin, Respiratory Tract, Mucous membranes, Kidneys, Liver

Prolonged (Chronic) Health Effects

Carcinogenicity:	This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA. Mixture with nitrites can form nitrosamines which have caused cancer in laboratory animals.
Reproductive and Developmental Toxicity:	No reproductive or developmental risk to humans is expected from exposure to this product.
Inhalation:	Prolonged or repeated inhalation may cause kidney and liver damage. There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure. Prolonged or repeated exposure may cause lung damage.
Skin Contact:	Prolonged or repeated exposure may cause extensive permanent skin damage.
Skin Absorption:	Prolonged or repeated exposure, may lead to harmful amounts of material being absorbed through the skin.

Ingestion:	Chronic (repeated) exposure may cause damage to the liver and kidneys. The acute corrosivity of this product, makes chronic ingestion of significant amounts unlikely.

Chronic Target Organ Toxicity:	Liver, Kidneys, Lungs, Eyes
Supplemental Health Hazard Information:	No additional health information available.

IV. FIRST AID

Inhalation:	IF INHALED: Remove individual to fresh air. If respiratory irritation develops, call a physician.
Skin Contact:	IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use. Call a physician.
Eyes:	IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids apart. Call a physician immediately.
Ingestion:	IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

V. FIRE FIGHTING MEASURES

Flammability Summary (OSHA): Combustible.

Flammable Properties

Flash Point:	Approximately 89 Deg. C. / Approximately 192 Deg. F.
Autoignition Temperature:	No data
Upper Flammable/Explosive Limit, % in air:	No data
Lower Flammable/Explosive Limit, % in air:	No data
Fire/Explosion Hazards:	Material may be ignited if preheated to temperatures above the flash point in the presence of a source of ignition.
Extinguishing Media:	Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires.
Fire Fighting Instructions:	Response to this material requires the use of a full encapsulated suit and full-face (NIOSH approved) self-contained breathing apparatus (SCBA). Use water to cool containers.
Hazardous Combustion Products:	Oxides of nitrogen, carbon dioxide, carbon monoxide

VI. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations:	Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.

Spill Mitigation Procedures

Air Release:	Hazardous concentrations in air may be found in local spill area and immediately downwind. 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 has approximately the same density as water. This material is soluble in water. Divert water flow around spill if possible and safe to do so. Notify all downstream users of possible contamination. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Land Release:	Create a dike or trench to contain materials. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Contain all contaminated water for disposal and/or treatment.
Additional Spill Information:	Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Remove all sources of ignition. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section XIII, Disposal Consideration.

VII. HANDLING AND STORAGE

Handling:	Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing (dust, vapor, mist, gas). Keep container closed when not in use. Use only with adequate ventilation. Ground and bond containers when transferring material.
Storage:	Store in a cool, dry and well ventilated place. Isolate from incompatible materials. Store in a tightly closed container. Outside or detached storage is preferred.
Shelf Life Limitations:	See label or certificate of analysis for shelf life if applicable.
Incompatible Materials for Storage:	Refer to Section X, "Incompatible Materials."
Do Not Store At temperatures Above:	25 Deg. C. 78 Deg. F.

VIII. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation:	Local exhaust ventilation or other engineering controls are necessary when handling or using this product.

Protective Equipment for Routine Use of Product

Respiratory Protection:	Wear a NIOSH approved respirator if any exposure occurs.
Respirator Type(s):	NIOSH approved full-face positive pressure supplied-air respirator
Skin:	Wear impervious gloves, boots and apron to avoid skin contact. A full impervious suit is recommended if exposure is possible to a large portion of the body.
Eyes:	Use chemical goggles and a faceshield.
Protective Clothing Type:	Natural rubber, Neoprene
Other PPE:	An eye wash and safety shower should be provided in the immediate work area.

Exposure Limit Data

CHEMICAL NAME	CAS #	OSHA PEL / STEL	ACGIH LIMITS	ACGIH WEEL
Ethanolamine	141-43-5	3 ppm TWA; 6 mg/m3 TWA	6 ppm STEL 3 ppm TWA	Not Established
Tetrahydrofurfuryl alcohol	97-99-4	None established	None established	2 ppm TWA; 8.4 mg/m3 TWA

CHEMICAL NAME	NIOSH Immediately Dangerous to Life or Health:
Ethanolamine	30 ppm IDLH

IX. PHYSICAL DATA

Physical State:	clear liquid
Color:	colorless
Odor	mild amine
Molecular Weight:	Not Applicable/Mixture
pH	12.6 (1:1 solution)
Octanol/Water Coeff:	No data
Solubility in Water:	Miscible
Bulk Density:	1.02 g/cc
Specific Gravity:	1.02
Vapor Density:	No data
Vapor Pressure:	(@ 20 Deg. C) 0.5 mmHg
Evaporation Rate:	No data
Boiling Point:	149 Deg. C. 300 Deg. F.
Freezing Point:	No data
Volatiles, % by vol.:	100 %

X. STABILITY AND REACTIVITY

Stability and Reactivity Summary:	Stable under normal conditions. Product is sensitive to electrical static discharge. Not sensitive to mechanical shock.
Reactive Properties:	Corrosive, Combustible.
Hazardous Polymerization:	Will not occur
Conditions to Avoid:	Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	acids, aluminum, galvanized iron, copper & copper alloys, strong oxidizing agents, organic anhydrides, strong alkalies, Mixture with nitrites can form nitrosamines which have caused cancer in laboratory animals.
Hazardous Decomposition Products:	ammonia, toxic gases, carbon dioxide, carbon monoxide

Decomposition Temperature: No data
Product May Be Unstable At Temperatures Above: > 100 Deg. C. > 212 Deg. F.

XI. TOXICOLOGICAL INFORMATION

Component Animal Toxicology

Oral LD50 value:	
Ethanolamine	Oral LD50 Rat = 1.7 g/kg
Tetrahydrofurfurylalcohol	Rat = 1.6 - 3.2 g/kg
Dermal LD50 value:	
Ethanolamine	Dermal LD50 Rabbit Approximately 1 g/kg
Tetrahydrofurfurylalcohol	Guinea pig = 2 - 5 ml/kg
Inhalation LC50 value:	
Ethanolamine	Inhalation LC50 (2h) Mouse > 2420 mg/cu m Inhalation LC50 (4h) Mouse > 970 ppm
Tetrahydrofurfurylalcohol	Inhalation LC50 (4h) Rat > 4700 ppm

Product Animal Toxicity (LD50 and/or LC50 values): No data

Skin Irritation: This material is expected to be corrosive.

Eye Irritation: This material is expected to cause irreversible effects to the cornea with impairment of vision or corrosion to the eyes.

Reproductive and Developmental Toxicity:	No reproductive or developmental risk to humans is expected from exposure to this product.
Component Data:	
Ethanolamine	This chemical has been tested in laboratory animals and no evidence of teratogenicity, embryotoxicity or fetotoxicity was seen.
Tetrahydrofurfuryl alcohol	This material has been tested and was found to cause testicular degeneration in laboratory animals.
Mutagenicity:	Not known or reported to be mutagenic.
Component Data:	
Ethanolamine	This material was non-mutagenic in the Ames test.
Carcinogenicity:	This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

XII. ECOLOGICAL INFORMATION

Overview:	Because of the high pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems. Biodegradable
Ecological Toxicity Values:	
Ethanolamine	Rainbow trout (Salmo gairdneri) 96 hr. LC50: = 150 mg/l (nominal, static). Mosquito fish (Gambusia affinis) 96 hr. LC50: = 337.5 mg/l (nominal, static). Daphnia magna, 24 hr. LC50: = 140 mg/l (nominal, static). Bluegill 96 hr. LC50: = 329.16 mg/l (nominal, static). Fathead minnow, 96 hr. LC50: = 2070 mg/l (measured, flow-through). Common shrimp (Crangon crangon) 48 hr. LC50: > 100 mg/l (nominal, renewal). Goldfish 24 hr. LC50: = 190 mg/l. Brine shrimp 48 hr. LC50: = 7100 ppm (salt water)

XIII. DISPOSAL CONSIDERATIONS

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.

Waste Disposal Summary:	Spent or discarded material may be a hazardous waste.
Potential US EPA Waste Codes:	D002
Disposal Methods:	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 treatment or incineration.

Components subject to land ban restrictions: Ethanolamine (D002)

XIV. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.
DOT Description (49 CFR 172.101):

Land (U.S. DOT):	ETHANOLAMINE SOLUTIONS 8 UN2491 PGIII
Air (IATA/ICAO):	SAME AS LAND
Water (IMO):	SAME AS LAND

Hazard Label/Placard: (Primary) CORROSIVE

Emergency Response Guide Number: 153

XV. REGULATORY INFORMATION

UNITED STATES:

Toxic Substances Control Act (TSCA): The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.

Pesticide acceptance indication: US EPA Registration Number: Not applicable

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311/312 (40 CFR 370.2):

Health: Acute
Chronic

Physical: Fire

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
Not applicable

Reportable Quantity (40 CFR 302.4):
None listed

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

No 313-listed chemicals in this product

Clean Air Act Socmi:	Ethanolamine
Clean Air Act VOC Section 111	Ethanolamine

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:	Ethanol, 2-amino- (Ethanolamine) 2-Furanmethanol, tetrahydro- (Tetrahydrofurfuryl alcohol)
New Jersey:	Ethanolamine
Massachusetts:	Ethanolamine, Tetrahydrofurfuryl alcohol

XVI. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revised to meet the ANSI standard of 16 sections.

MAJOR REFERENCES:

- Amoore, John, E. and Earl Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatiles214 Industrial Chemicals in Air and Water Dilution. Journal of Applied Toxicology, Vol. 3, No. 6, pp. 272-290, 1983.

- Industrial Bio-Test Laboratories: Ninety-Day Subacute Oral Toxicity Study of Tetrahydrofurfuryl Alcohol in Albino Rats. Report No. IBTB8494. Report to Quaker Oats Co., P.O. Box 3514, Merchandise Mart Station, Chicago, IL 60654. (1970).
- Industrial Bio-Test Laboratories: Ninety-Day Subacute Oral Toxicity Study of Tetrahydrofurfuryl Alcohol in Beagle Dogs. Report No. IBTJ8493. Report to Quaker Oats Co., P.O. Box 3514, Merchandise Mart Station, Chicago, IL 60654. (1970).
- Final Report on the Safety Assessment of Triethanolamine,Diethanolamine, and Monoethanolamine. Journal of the American Collegeof Toxicology, Vol. 2, No. 7, 1983. pp. 183-235.
- Dean, B.J., et al., Genetic Toxicology Testing of 41 Industrial Chemicals. Mutation Research, 153, 1985, pp. 57-77.
- Mortelmans, Kristien, et al., Salmonella Mutagenicity Tests:II. Results From the Testing of 270 Chemicals. Environmental Mutagenesis,Vol. 8, Supplement 7, 1986, pp. 1-119.
- Bridie, A.L., et al., The Acute Toxicity of Some Petrochemicals to Goldfish. Water Research, Vol. 13, 1979, pp. 623-626.
- Primary Skin Irritation Tests With Nine Samples in Albino Rabbits, Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT No.A1907, August 2, 1972.

Other references available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION INTHIS MSDS SHOULD BE PROVIDEDTO 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. ARCH CHEMICALS 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 MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.