

OHS09560

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SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION  
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MDL INFORMATION SYSTEMS, INC.  
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EMERGENCY TELEPHONE NUMBER:  
1-800-424-9300 (NORTH AMERICA)  
1-703-527-3887 (INTERNATIONAL)

SUBSTANCE: ETHYLENEDIAMINE

## TRADE NAMES/SYNONYMS:

1,2-DIAMINOETHANE; 1,2-ETHYLENEDIAMINE; DIAMINOETHANE; ETHYLENDIAMINE;  
BETA-AMINOETHYLAMINE; DIMETHYLENEDIAMINE; 1,2-ETHANEDIAMINE;  
ALPHA,GAMMA-ETHANEDIAMINE; 1,4-DIAZABUTANE; UN 1604; C2H8N2; OHS09560; RTECS  
KH8575000

CHEMICAL FAMILY: amines, aliphatic

CREATION DATE: Dec 10 1984

REVISION DATE: Dec 11 2001

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SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS  
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COMPONENT: ETHYLENEDIAMINE  
CAS NUMBER: 107-15-3  
EC NUMBER (EINECS): 203-468-6  
EC INDEX NUMBER: 612-006-00-6  
PERCENTAGE: 100.0

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SECTION 3 HAZARDS IDENTIFICATION  
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NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=2 REACTIVITY=0

## EMERGENCY OVERVIEW:

CHANGE IN APPEARANCE: hygroscopic

COLOR: colorless to yellow

PHYSICAL FORM: liquid

ODOR: ammonia odor

MAJOR HEALTH HAZARDS: potentially fatal if inhaled, harmful on contact with  
the skin, respiratory tract burns, skin burns, eye burns, mucous membrane  
burns, allergic reactions

PHYSICAL HAZARDS: Flash back hazard. Combustible liquid and vapor.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: potentially fatal if inhaled, allergic reactions, burns

LONG TERM EXPOSURE: allergic reactions, chest pain, difficulty breathing, irregular heartbeat, headache, lung congestion, blood disorders

SKIN CONTACT:

SHORT TERM EXPOSURE: allergic reactions, burns

LONG TERM EXPOSURE: irritation, allergic reactions

EYE CONTACT:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: burns

INGESTION:

SHORT TERM EXPOSURE: burns

LONG TERM EXPOSURE: burns

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

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#### SECTION 4 FIRST AID MEASURES

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INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing and shoes before reuse. Destroy contaminated shoes.

EYE CONTACT: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If swallowed, drink plenty of water, do NOT induce vomiting. Get immediate medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. For ingestion, consider gastric lavage.

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#### SECTION 5 FIRE FIGHTING MEASURES

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FIRE AND EXPLOSION HAZARDS: Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive above flash point.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam, alcohol resistant foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Do not get water inside container. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile).

FLASH POINT: 104 F (40 C)

LOWER FLAMMABLE LIMIT: 2.5%

UPPER FLAMMABLE LIMIT: 12.0% @ 100 C

AUTOIGNITION: 725 F (385 C)

FLAMMABILITY CLASS (OSHA): II

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## SECTION 6 ACCIDENTAL RELEASE MEASURES

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### AIR RELEASE:

Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste.

### SOIL RELEASE:

Trap spilled material at bottom in deep water pockets, excavated holding areas or within sand bag barriers. Dike for later disposal. Absorb with sand or other non-combustible material. Add dilute acid.

### WATER RELEASE:

Cover with absorbent sheets, spill-control pads or pillows. Neutralize. Collect with absorbent into suitable container. Add a reducing agent. Absorb with activated carbon. Collect spilled material using mechanical equipment.

### OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water inside container. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response

Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

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SECTION 7 HANDLING AND STORAGE

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STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). Protect from physical damage. Store in a cool, dry place. Store in a well-ventilated area. Avoid heat, flames, sparks and other sources of ignition. Keep separated from incompatible substances. Store in a tightly closed container.

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SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

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EXPOSURE LIMITS:

ETHYLENEDIAMINE:

- 10 ppm (25 mg/m<sup>3</sup>) OSHA TWA
- 10 ppm ACGIH TWA (skin)
- 10 ppm (25 mg/m<sup>3</sup>) NIOSH recommended TWA 10 hour(s)
- 25 mg/m<sup>3</sup> (10 ml/m<sup>3</sup>) DFG MAK (peak limitation category-II, 1)
- 10 ppm (25 mg/m<sup>3</sup>) UK OES TWA

MEASUREMENT METHOD: XAD-2(R) tube (with special coating); Dimethylformamide; High-pressure liquid chromatography with ultraviolet detection; NIOSH IV # 2540

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

250 ppm

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with cartridge(s) providing protection against this substance.

500 ppm

Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against this substance.

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against this substance.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

1000 ppm

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

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## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

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PHYSICAL STATE: liquid

COLOR: colorless to yellow

CHANGE IN APPEARANCE: hygroscopic

TEXTURE: viscous

ODOR: ammonia odor

MOLECULAR WEIGHT: 60.10

MOLECULAR FORMULA: H<sub>2</sub>-N-C-H<sub>2</sub>-C-H<sub>2</sub>-N-H<sub>2</sub>

BOILING POINT: 243 F (117 C)

FREEZING POINT: 48 F (9 C)

VAPOR PRESSURE: 10 mmHg @ 20 C

VAPOR DENSITY (air=1): 2.07

SPECIFIC GRAVITY (water=1): 0.8995

WATER SOLUBILITY: soluble

PH: 11.9 (25% solution)

VOLATILITY: 100%

ODOR THRESHOLD: 10 ppm

EVAPORATION RATE: 0.91 (butyl acetate=1)

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

## SOLVENT SOLUBILITY:

Soluble: alcohol  
Slightly Soluble: ether  
Insoluble: benzene

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SECTION 10 STABILITY AND REACTIVITY  
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REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition.  
Minimize contact with material. Keep out of water supplies and sewers.

INCOMPATIBILITIES: acids, combustible materials, halo carbons, metals,  
reducing agents, oxidizing materials

## ETHYLENEDIAMINE:

ACETIC ACID: Temperature and pressure increase in a closed container.

ACETIC ANHYDRIDE: Temperature and pressure increase in a closed container.

ACIDS (STRONG): Fire and explosion hazard.

ACROLEIN: Temperature and pressure increase in a closed container.

ACRYLIC ACID: Temperature and pressure increase in a closed container.

ACRYLONITRILE: Temperature and pressure increase in a closed container.

ALLYL CHLORIDE: Temperature and pressure increase in a closed container.

ALUMINUM: May be corrosive.

CARBON DISULFIDE: Temperature and pressure increase in a closed container.

CELLULOSE NITRATE: Ignites spontaneously.

CHLORINATED HYDROCARBONS: Violent reaction.

CHLOROSULFONIC ACID: Temperature and pressure increase in a closed  
container.

DIISOPROPYLPEROXYDICARBONATE: Spontaneous decomposition.

EPICHLOROHYDRIN: Temperature and pressure increase in a closed container.

ETHYLENE CHLOROHYDRIN: Temperature and pressure increase in a closed  
container.

HYDROCHLORIC ACID: Temperature and pressure increase in a closed container.

MESITYL OXIDE: Temperature and pressure increase in a closed container.

NITRIC ACID: Temperature and pressure increase in a closed container.

NITROMETHANE: Increased sensitivity toward detonation.

OLEUM: Temperature and pressure increase in a closed container.

OXIDIZERS (STRONG): Fire and explosion hazard.

BETA-PROPIOLACTONE: Temperature and pressure increase in a closed container.

SILVER PERCHLORATE: Explosive reaction.

SULFURIC ACID: Temperature and pressure increase in a closed container.

VINYL ACETATE: Temperature and pressure increase in a closed container.

ZINC: May be corrosive.

## HAZARDOUS DECOMPOSITION:

Thermal decomposition products: ammonia, oxides of nitrogen, carbon

POLYMERIZATION: Will not polymerize.

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SECTION 11 TOXICOLOGICAL INFORMATION  
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ETHYLENEDIAMINE:

IRRITATION DATA:

450 mg open skin-rabbit moderate; 10 mg/24 hour(s) open skin-rabbit severe;  
750 ug eyes-rabbit severe; 750 ug/24 hour(s) eyes-rabbit severe

TOXICITY DATA:

4000 ppm/8 hour(s) inhalation-rat LC10; 200 ppm inhalation-human TCLo; 1200  
mg/kg oral-rat LD50; 4000 ppm/8 hour(s) inhalation-rat LCLo; 76 mg/kg  
intrapertitoneal-rat LD50; 300 mg/kg subcutaneous-rat LD50; 1 gm/kg  
oral-mouse LD50; 300 mg/m3 inhalation-mouse LC50; 200 mg/kg  
intrapertitoneal-mouse LD50; 100 mg/kg intravenous-dog LDLo; 730 ul/kg  
skin-rabbit LD50; 500 mg/kg subcutaneous-rabbit LDLo; 470 mg/kg oral-guinea  
pig LD50; 3500 mg/kg/7 day(s) continuous oral-rat TDLo; 39 gm/kg/13 week(s)  
intermittent oral-rat TDLo; 700 ug/m3/17 week(s) intermittent inhalation-rat  
TDLo; 225 ppm/7 hour(s)-30 day(s) intermittent inhalation-rat TCLo; 540  
mg/kg/6 week(s) intermittent oral-rat TDLo

CARCINOGEN STATUS: ACGIH: A4 -Not Classifiable as a Human Carcinogen

LOCAL EFFECTS:

Corrosive: inhalation, skin, eye, ingestion

ACUTE TOXICITY LEVEL:

Highly Toxic: inhalation

Toxic: dermal absorption

Moderately Toxic: ingestion

TARGET ORGANS: immune system (sensitizer)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: immune system disorders or  
allergies, respiratory disorders

MUTAGENIC DATA:

mutation in microorganisms - Salmonella typhimurium 33 ug/plate (+S9);

mutation in microorganisms - Salmonella typhimurium 1 mg/plate (-S9)

REPRODUCTIVE EFFECTS DATA:

3200 mg/kg oral-mouse TDLo 6-13 day(s) pregnant female continuous

ADDITIONAL DATA: May cross react with similar compounds.

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

ETHYLENEDIAMINE: Human exposure to 200 ppm for 5-10 seconds caused facial  
tingling and slight nasal irritation; 400 ppm caused intolerable nasal  
irritation. Other symptoms may include respiratory tract irritation,  
cough, dyspnea, vomiting, nausea and pulmonary edema. Pulmonary  
sensitization, manifested by asthmatic breathing, may occur in previously

exposed persons. Rats exposed to 4000 ppm for 8 hours died from kidney damage.

#### CHRONIC EXPOSURE:

ETHYLENEDIAMINE: Prolonged or repeated exposure to non-irritating levels may result in pulmonary sensitization with bronchial asthma. Chronic bronchitis has also been reported. Symptoms may include eosinophilia, wheezing, chest tightness, coughing, dyspnea, sneezing, nasal discharge, sweating, headaches, malaise, and tachycardia. Exposure to 484 ppm for 20 days caused depilation and lung, kidney and liver damage, and death in rats.

#### SKIN CONTACT:

##### ACUTE EXPOSURE:

ETHYLENEDIAMINE: Direct contact with aqueous solutions may cause severe irritation. Undiluted liquid may cause burns. Blistering may occur and be partly due to sensitization in previously exposed persons. Animal studies indicate fatal amounts may be absorbed through intact skin. Skin absorption is enhanced by tissue damage.

##### CHRONIC EXPOSURE:

ETHYLENEDIAMINE: Repeated or prolonged exposure may cause dermatitis due either to irritation or sensitization. Sensitization is more likely to occur when the skin is damaged.

#### EYE CONTACT:

##### ACUTE EXPOSURE:

ETHYLENEDIAMINE: Low vapor concentrations may cause some blurring of vision and haloes around objects. High vapor concentrations may cause acute pain and severe irritation. The liquid may cause burns, corneal destruction, and blindness. An aqueous 15% solution caused serious corneal damage to rabbit eyes; a 5% solution caused partial corneal opacity.

##### CHRONIC EXPOSURE:

ETHYLENEDIAMINE: Effects depend on concentration and duration of exposure. Repeated or prolonged contact with corrosive substances may result in conjunctivitis or effects as in acute exposure.

#### INGESTION:

##### ACUTE EXPOSURE:

ETHYLENEDIAMINE: Ingestion may cause burns of the mouth and throat, abdominal pain, nausea, and vomiting. The reported lethal dose in rats was 500 mg/kg; the symptoms were not reported.

##### CHRONIC EXPOSURE:

ETHYLENEDIAMINE: Therapeutic use has resulted in severe exfoliative dermatitis. Reproductive effects have been reported in animals. Depending on the concentrations, repeated ingestion of corrosive substances may

cause effects as with acute ingestion.

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SECTION 12 ECOLOGICAL INFORMATION

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ECOTOXICITY DATA:

FISH TOXICITY: 220000 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow  
(Pimephales promelas)

INVERTEBRATE TOXICITY: 150 mg/L 24 hour(s) EC100 (Abundance) Water flea  
(Daphnia magna)

ALGAL TOXICITY: 100000 ug/L 96 week(s) EC50 (Growth) Green algae (Chlorella  
pyrenoidosa)

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SECTION 13 DISPOSAL CONSIDERATIONS

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Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste  
Number(s): D001. Dispose in accordance with all applicable regulations.

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SECTION 14 TRANSPORT INFORMATION

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U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Ethylenediamine  
ID NUMBER: UN1604  
HAZARD CLASS OR DIVISION: 8  
PACKING GROUP: II

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Ethylenediamine  
UN NUMBER: UN1604  
ADR/RID CLASS: 8  
CLASSIFICATION CODE: CF1  
PACKING GROUP: II

AIR TRANSPORT IATA/ICAO:

PROPER SHIPPING NAME: Ethylenediamine  
UN/ID NUMBER: UN1604  
IATA/ICAO CLASS: 8  
PACKING GROUP: II

## MARITIME TRANSPORT IMDG:

PROPER SHIPPING NAME: Ethylenediamine  
UN NUMBER: UN1604  
IMDG CLASS: 8  
PACKING GROUP: II

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SECTION 15 REGULATORY INFORMATION  
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## U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):  
ETHYLENEDIAMINE: 5000 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):  
ETHYLENEDIAMINE: 10000 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):  
ETHYLENEDIAMINE: 5000 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):  
ACUTE: Yes  
CHRONIC: Yes  
FIRE: Yes  
REACTIVE: No  
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

## STATE REGULATIONS:

California Proposition 65: Not regulated.

## CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: Not determined.

## EUROPEAN REGULATIONS:

EC CLASSIFICATION (ASSIGNED):  
Flammable  
Xn Harmful  
C Corrosive  
Sensitizing

EC Classification may be inconsistent with independently-researched data.

## DANGER/HAZARD SYMBOL:

C Corrosive

## EC RISK AND SAFETY PHRASES:

R 10 Flammable.  
R 21/22 Harmful in contact with skin and if swallowed.  
R 34 Causes burns.  
R 42/43 May cause sensitization by inhalation and skin contact.

S 1/2 Keep locked-up and out of reach of children.  
S 23 Do not breathe gas, fumes, vapor, or spray.  
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection.  
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

## CONCENTRATION LIMITS:

C >= 25%	C	R 21/22-34-42/43
10% <= C < 25%	C	R 34-42/43
2% <= C < 10%	Xn	R 36/38-42/43
1% <= C < 2%	Xn	R 42/43

## GERMAN REGULATIONS:

WATER HAZARD CLASS (WGK):

STATE OF CLASSIFICATION: VwVwS

CLASSIFICATION UNDER HAZARD TO WATER: 2

## NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

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SECTION 16 OTHER INFORMATION  
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