PART II

BUSINESS PERSONNEL EMERGENCY

NOTIFICATIONS AND RESPONSIBILITIES

PART II BUSINESS PERSONNEL EMERGENCY NOTIFICATIONS AND RESPONSIBILITIES

A) EMPLOYEE EVACUATION

1. The type of alarm signals that will be used to initiate an evacuation of the facility:

Alerting by supervision to evacuate building.

(Describe)

2. Evacuation routes, emergency exits, and staging areas for employees at the facility:

a. Work area: Assembly (area 6)
Evacuation route: thruogh front lobby (exit 2)
Emergency exits: 2 (front & rear)
Staging area: in front of building

b. Work area: mechanical assembly (area 9)
Evacuation route: through back door (exit 4)
Emergency exits: 2 (front & rear)
Staging area: in front of building

c. Work area: conformal coating room (area 7)
Evacuation route: through front lobby (exit 2)
Emergency exits: 2 (front & rear)
Staging area: in front of building

d. Work area: waver solder room (area 4)
Evacuation route: through receiving area (exit 3)
Emergency exits: 2 (front & rear)
Staging area: in front of building

C) EMPLOYEE RESPONSIBILITIES:

JOB TITLE : Quality Manager (Evacuation Coordinator)

EMERGENCY FUNCTION(S)

a. Making sure all employees have evacuated & located in staging area safely.

b. Completing carrying out task completion sheet for emergency responders.

c. Identifying the nature and extent of problem.

d.

JOB TITLE : General Manager

EMERGENCY FUNCTION(S)

a. Do the same as above.

b.

c.

d.

JOB TITLE : Production Manager

EMERGENCY FUNCTION(S)

a. Do the same as above.

b.

c.

d.

PART III

TRAINING

UTILIZE ADDITIONAL COPIES AS REQUIRED

EVACUATION DRILLS SHALL BE CONDUCTED ANNUALLY
OR MORE FREQUENTLY IF REQUIRED

Records of drills shall be maintained for a period of three years and shall be available for review by Fire Department personnel. The record shall include the facilitator's name, title, facility location, date of drill, and the signature of the facilitator.

PART III TRAINING (SEE YELLOW INSTRUCTION GUIDE PG. 8)

OUTLINE THE STEPS YOUR BUSINESS SHALL TAKE TO MEET THE TRAINING REQUIREMENTS NOTED IN THIS SECTION.

A) METHODS FOR SAFE HANDLING OF HAZARDOUS MATERIALS:

Review of all company procedures for handling hazardous materials during employee safety class. Performed yearly and at new employee orientation.

a) Protective clothing, equipment for materials handled.
b) Proper handling & transportation techniques.
c) Hazardous materials properly stored, segregated, and labeled.

B) PROCEDURES FOR NOTIFICATION OF AND COORDINATION WITH EMERGENCY AGENCIES:

Review with administration/management on emergency renew and notification.

a) Responsibilities in case of emergency.
b) Notification of Fire Dept. dialing 911.
c) Designated employee (Qual. Mgr, Gen. Mgr, Prod. Mgr) trained to call (916)427-4341 (state) and report information of emergency.

C) USE OF EMERGENCY RESPONSE EQUIPMENT AND SUPPLIES UNDER THE CONTROL OF THE HANDLER:

Review with entire company during employee safety class.

a) How fire extinguishers, eye stations, and safety kits work.

D) EMERGENCY MITIGATION PROCEDURES IN RESPONSE TO A RELEASE OR THREATENED RELEASE OF A HAZARDOUS MATERIAL:

Done during review with employees in safety class.

a) Evacuation procedures, drill walk-thrus, staging areas
b) Emergency coordinator alternate has been assigned.

E) RECORDS OF TRAINING (SEE YELLOW INSTRUCTION GUIDE PG. 9)

Will be kept on file for 3 years.

PART IV

PREVENTION

GARDEN GROVE FIRE DEPARTMENT
BUSINESS EMERGENCY PLAN

PART IV PREVENTION

LIST ACTIONS WHICH HAVE BEEN ACCOMPLISHED TO ABATE HAZARDS RELATING TO THE USE, HANDLING, OR STORAGE OF HAZARDOUS MATERIALS

HAZARDOUS MATERIALS STORAGE LOCATION	PREVENTATIVE MEASURES
1. Fire storage cabinets	Company training program & procedures
2. Location knowledge & awareness of MSDS	Knowledge of company hazardous materi
3. General	Labeling of all hazardous materials.
4.	
5.	
6.	
7.	
8.	

Comments relating to the listed storage areas:

UTILIZE ADDITIONAL COPIES AS REQUIRED

PART V

A) SITE LAYOUT MAP

B) Site Plan

Use the symbols below to indicate on the attached sheet specific areas on the Site Plan. The Site Plan should be neat, clean, and drawn to scale if possible.

12	HAZARDOUS MATERIAL LISTED BY SYMBOL AND NUMBER.	NOTE: THIS NUMBER SHOULD CORRESPOND WITH NUMBERS LISTED ON DISCLOSURE FORM.
E	ELECTRICAL MAIN	
G	GAS MAIN	
W	WATER MAIN	
	EVACUATION AREA	
N	NORTH DIRECTIONAL ARROW	
KB	INDICATE KNOX BOX LOCATIONS (lock box for keys)	
AS	AUTOMATED SPRINKLERED BUILDING	NEEDED ON ALL SPRINKLERED BUILDINGS.
	FIRE DEPARTMENT SPRINKLER CONNECTION	
	FIRE HYDRANT	

GARDEN GROVE

FIRE DEPARTMENT

HAZARDOUS MATERIALS DISCLOSURE PROGRAM

REPORTING FORMS PACKET

SHORT VERSION

FOR OFFICIAL USE ONLY

FACILITY ID NO. 9042

BUSINESS NAME LA Testing

BUSINESS ADDRESS 11652 Knott St

APPROVED BY G DATE 3/23/11

NEW BUSINESS ☐ YES ☐ NO UPDATE _____

PICK __ 4D __ BUSLIST __ CALARP: __ CUPA: __ GIS __

FEE _____

Revised 2/2007

FORM 1

CITY OF GARDEN GROVE FIRE DEPARTMENT

11301 Acacia Parkway, Garden Grove, CA 92842 (714) 741-5600 (714) 741-5636

Hazardous Materials Business Information Form

BUSINESS INFORMATION

FACILITY # (Supplied by GGFD) 3 0 0 3 5	BEGINNING DATE 1: 2/10/11	ENDING DATE 2:	
BUSINESS NAME 4: L.A. TESTING		BUSINESS PHONE 5: 8007551794	
BUSINESS SITE ADDRESS 6: 11652 KNOTT ST. UNIT F5 GG			
CITY 7: GARDEN GROVE	STATE 8: CA	ZIP 9: 92841	
DUN & BRADSTREET 10:	SIC CODE (4 DIGIT #) 11:	FIRE DISTRICT 12:	
COUNTY 13: ORANGE			
BUSINESS OPERATOR NAME 14: MICHAEL CHAPMAN		OPERATOR'S PHONE 15: 800 7551794	

BUSINESS OWNER

OWNER NAME: PETER FRASCA		OWNER PHONE 17: [redacted]	
OWNER MAILING ADDRESS 18: [redacted]			
CITY 19: [redacted]	STATE 20: [redacted]	ZIP 21: [redacted]	

ENVIRONMENTAL CONTACT

CONTACT NAME 22: MICHAEL CHAPMAN		CONTACT PHONE 23: 8007551794	
CONTACT MAILING ADDRESS 24: 11652 KNOTT ST F5			
CITY 25: GARDEN GROVE	STATE 26: CA	ZIP 27: 92841	

EMERGENCY CONTACTS

PRIMARY		SECONDARY	
NAME 28: MICHAEL CHAPMAN		NAME 33: BEN SUBCASKY JR	
TITLE 29: LABORATORY MANAGER		TITLE 34: OPERATIONS MANAGER	
BUSINESS PHONE 30: 800 7551794		BUSINESS PHONE 35: 602 2764344	
24-HR. PHONE 31: [redacted]		24-HR. PHONE 36: [redacted]	
PAGER # 32:		PAGER # 37:	

ADDITIONAL LOCALLY COLLECTED INFORMATION

DESCRIBE THE TYPE OF BUSINESS OPERATION: 38 LABORATORY		TOTAL # OF EMPLOYEES 39: 14	
BILLING ADDRESS (IF DIFFERENT FROM ABOVE) 40: 11652 KNOTT ST FF GG 92841		ATTENTION 41: MICHAEL CHAPMAN	
PROPERTY OWNER NAME 42:	ADDRESS 43:	PHONE 44:	

Certification: Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the information is true, accurate, and complete.

SIGNATURE OF OWNER/OPERATOR OR DESIGNATED REPRESENTATIVE 45: [signature]		DATE 46: 3/10/11	
NAME OF SIGNER *(print)* 47: MICHAEL CHAPMAN		NAME OF DOCUMENT PREPARER *(print)* 49: MICHAEL CHAPMAN	
TITLE OF SIGNER 48: LABORATORY MANAGER		TITLE OF DOCUMENT PREPARER 50: LABORATORY MANAGER	

CITY OF GARDEN GROVE
11301 ACACIA PARKWAY
GARDEN GROVE, CALIFORNIA 92842
(714) 741-5636

CUPA

BUSINESS ACTIVITIES

FACILITY INFORMATION

I. FACILITY IDENTIFICATION

FACILITY ID# 3 0 [redacted] 0 3 5 [redacted] 1.

2. EPA ID # (Hazardous Waste Only) ~~CAL000350383~~ CAL000356363

3. BUSINESS NAME (Same as FACILITY NAME or DBA-Doing Business As) L A Testing

II. ACTIVITIES DECLARATION

NOTE: If you check YES to any part of this list, please submit the Business Owner/Operator Identification page.

Does your facility...		If Yes, please complete these pages of the UPCF...
A. HAZARDOUS MATERIALS		
Have on site (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70?	☑ YES ☐ NO 4.	✓ HAZARDOUS MATERIALS INVENTORY - CHEMICAL DESCRIPTION (Form 3)
B. UNDERGROUND STORAGE TANKS (USTs)		
1. Own or operate underground storage tanks?	☐ YES ☑ NO 5.	✓ UST FACILITY (Formerly SWRCB Form A) ✓ UST TANK (one page per tank) (Formerly Form B)
2. Intent to upgrade existing or install new USTs?	☐ YES ☑ NO 6.	✓ UST FACILITY ✓ UST TANK (one per tank) ✓ UST INSTALLATION - CERTIFICATE OF COMPLIANCE (one page per tank) (Formerly Form C)
3. Need to report closing a UST?	☐ YES ☐ NO 7.	✓ UST TANK (closure portion-one page per tank)
C. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)		
Own or operate ASTs above these thresholds: - any tank capacity is greater than 660 gallons, or - the total aggregate capacity for the entire facility (ASTs, drums and portable containers) greater than 1,320 gallons?	☐ YES ☑ NO 8.	✓ NO FORM REQUIRED TO CUPAS
D. HAZARDOUS WASTE		
1. Generate hazardous waste?	☑ YES ☐ NO 9.	✓ EPA ID NUMBER - provide at the top of this page
2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC §25143.2)?	☐ YES ☑ NO 10.	✓ RECYCLABLE MATERIALS REPORT (one per recycler)
3. Treat hazardous waste on site?	☐ YES ☑ NO 11.	✓ ONSITE HAZARDOUS WASTE TREATMENT - FACILITY (Formerly DTSC Forms 1772) ✓ ONSITE HAZARDOUS WASTE TREATMENT - UNIT (one page per unit) (Formerly DTSC Forms 1772A,B,C,D and L)
4. Treatment subject to financial assurance requirements (for Permit by Rule and Condition Authorization)?	☐ YES ☑ NO 12.	✓ CERTIFICATION OF FINANCIAL ASSURANCE (Formerly DTSC Form 1232)
5. Consolidate hazardous waste generated at a remove site?	☐ YES ☑ NO 13.	✓ REMOTE WASTE/CONSOLIDATION SITE ANNUAL NOTIFICATION (Formerly DTSC Form 1196)
6. Need to report the closure/removal of a tank that was classified waste and cleaned onsite?	☐ YES ☑ NO 14.	✓ HAZARDOUS WASTE TANK CLOSURE CERTIFICATION (Formerly DTSC Form 1249)
E. LOCAL REQUIREMENTS		
Cal-ARP: California Accidental Release Prevention Program *H&SC Chapter 6.95, Article 2, §25531 et seq* --- Stationary Source with more than a Threshold Quantity of a Regulated Substance in a Process	☐ YES ☑ NO 15.	✓ REGULATED SUBSTANCE REPORTING FORM (Orange County CUPA)

GARDEN GROVE FIRE DEPARTMENT
HAZARDOUS MATERIALS DISCLOSURE PROGRAM

BUSINESS EMERGENCY PLAN

Personnel Emergency Notifications and Responsibilities

Employee Evacuation and Staging Areas:

1. The type of alarm signal that will be used to initiate an evacuation at the facility (vocal, paging system, manual alarm, etc.).

   VOCAL

2. All employees shall be trained to evacuate the facility through at least one exit. Alternate exit routes shall be designated if available.

3. Staging areas shall be designated for all employees. Staging areas will be the location that all employees shall report to in the event of an emergency.

   One person shall be designated to account for all personnel at the staging area. That person will be responsible for meeting the incoming Fire units and reporting the conditions known about the incident.

   The Staging area is at the following location as shown on your site plan map:

   30 Feet North of INGRESS/EGRESS

Employee Responsibilities:

At least one employee shall be responsible for the following minimum requirements in the event of an emergency response by the Fire Department.

1. Notify employees. Initiate evacuation procedures.
2. Notify the Garden Grove Fire Department. Dial 911.
3. Try to identify the nature of the incident.
4. Report to the staging area and account for evacuated employees.
5. Report to the incoming fire units.
6. Activate any emergency mitigation procedures that area available at your business. (List below any mitigation procedures specific to your business, if any.)

   Chemical Containment of Any Spill using Absorbant Pads - Fire Extinguisher For Fires

Personnel Emergency Notifications and Responsibilities (Continued)

Training Requirements

State law requires training of employees where the business uses, handles or stores hazardous materials.

Employee training provided on:

- Appointment of person/persons on site who are trained in key role positions. Emergency coordinator, evacuation coordinators, staging area supervisors and documenting officers.
- Procedures to follow during a release or threatened release of a hazardous material (evacuation to staging areas).
- Information contained in material safety data sheets.
- Warning labels/placards.
- Safe work practices.
- Use of on-site emergency equipment and supplies.
- Use and location of personal protective equipment.
- Any chemical, hazardous material or substance that could be encountered in his/her work area.
- On site alarm system for evacuation.
- Discuss possible release of hazardous materials scenario.

Emergency Notifications

A handler of hazardous materials is required to immediately report any release or threatened release of hazardous materials to the Garden Grove Fire Department. Failure to do so may result in criminal and/or civil prosecution.

Required Notifications

In the event of a release or threatened release of hazardous materials, it is State law to notify each of the following agencies.

Agency	Phone Numbers
Garden Grove Fire Department, Police, Paramedics	911
Office of Emergency Services (OES)	(800) 852-7550 or (916) 427-4341
National Response Center	(800) 424-8802

GARDEN GROVE FIRE DEPARTMENT
HAZARDOUS MATERIALS DISCLOSURE PROGRAM

BUSINESS EMERGENCY PLAN

Personnel Emergency Notifications and Responsibilities (Continued)

Prevention

All materials are stored, used and handled within the guidelines of the Uniform Fire Code, N.F.P.A. standards, California Administrative Code, Titles 19 and 20.

This section is meant to initiate a Prevention Plan at your business and to assist in preventing a release, or threatened release, of a hazardous material. In the spaces provided, place a checkmark by the preventive actions which have been initiated by your business to abate hazards relating to hazardous material handling, use of storage.

Consideration shall include:

1. Drum storage and/or above ground tank storage areas:
   - ___ a. Isolation and separation of incompatible materials.
   - ✓ b. Diking areas to contain spills.
   - ✓ c. Storage on paved ground.

2. Compressed and/or cryogenic gas storage areas:
   - ✓ a. Cylinder stored upright and secured.
   - ___ b. Isolation and/or separation of incompatible cylinders (oxygen and flammable gases, etc.).

3. General:
   - ✓ a. Safe work practices are exercised in daily routines.
   - ✓ b. Employees who handle hazardous materials are properly trained.
   - ✓ c. Material Safety Data Sheets (MSDS) readily available for each hazardous material on the premises.
   - ___ d. Labeling of all materials and storage areas with the product name and hazards associated with the product (drums, piping, tanks, etc.).
   - ___ e. Uniform Fire Code (UFC) requires separation between outside hazardous material storage area or tanks and combustible materials (wood, bush, etc.).
   - ___ f. Posting of "No Smoking" signs where appropriate.

GARDEN GROVE FIRE DEPARTMENT

BUSINESS EMERGENCY PLAN

A BUSINESS IS REQUIRED BY LAW TO NOTIFY THE GARDEN GROVE FIRE DEPARTMENT WITHIN 30 DAYS OF ANY OF THE FOLLOWING EVENTS.

1. Change of business address.
2. Change of business ownership.
3. Change of business name.
4. Cessation of business operation (quitting business).
5. Use or handling of a previously undisclosed hazardous material.
6. A 100% increase in the quantity of a previously disclosed hazardous material.

Your business is required by State law (CFC 8001.3.2) to retain a copy of this entire Hazardous Materials Disclosure information, including the Business Plan, chemical inventory, material safety data sheets and site maps, for review by Fire Department personnel. State where your disclosure and Emergency Business Plan will be kept.

OFFICE AREA IN FRONT OF BUILDING

Show location on site map also using symbol in the legend.

Note: A fee is charged for a replacement copy from the Garden Grove Fire Department.

I certify, under penalty of perjury, that the enclosed information is true and correct to the best of my knowledge.

Signature: Michael Chapman

Name: MICHAEL CHAPMAN

Title: LABORATORY MANAGER

Date: 2/10/11

HAZ BUS DISCL SHORT VER

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

☐ ADD ☐ DELETE ☐ REVISED 1

Page 2 of ____ 2

FACILITY ID# 3 0 0 3 5 38 BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION D 9 4

CONFIDENTIAL LOCATION EPCRA ☒ Yes ☐ No 5 | MAP # 6 | GRID # 09 7

II. CHEMICAL INFORMATION

CHEMICAL NAME Carbon Disulfide | WASTE ☐ Yes 8 | TRADE SECRET ☐ Yes ☒ No 11
* If EPCRA see instructions

COMMON NAME 11 11 9 | An EHS Chemical ☒ Yes ☐ No 12
*If EHS is "Yes", all amounts must be LBS

CAS # 75-15-0 10 | FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14 | RADIOACTIVE ☐ Yes ☒ No 15 | CURIES 16

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 17 | FED HAZARD CATEGORIES ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 18

AVERAGE DAILY AMOUNT 20 19 | MAXIMUM DAILY AMOUNT 40 20 | ANNUAL WASTE AMOUNT 21 | STATE WASTE CODE 22

UNITS ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS 23
*If EHS, amount must be in pounds. | DAYS ON SITE 365 24 | LARGEST CONTAINER 8 lbs 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d STEEL DRUM
☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY
☐ i. VAT ☐ l. FIBER DRUM ☐ l. BAG(S) ☐ l. BOX(S)
☐ m CYLINDER ☒ n. GLASS CONTAINER ☐ o PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP
☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER____

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	29	30	☐ Yes ☐ No 31	32
2	29	30	☐ Yes ☐ No 31	32
3	29	30	☐ Yes ☐ No 31	32
4	29	30	☐ Yes ☐ No 31	32
5	29	30	☐ Yes ☐ No 31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

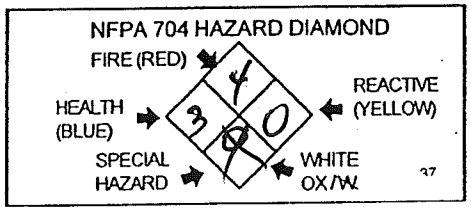
UNDOT # 1131 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS Flammable Liquid / Poison 34
Refer to shipping papers or MSDS

EPCRA ☒ YES ☐ NO 35

x _____ 36
If EPCRA, Please Sign Here

NFPA 704 HAZARD DIAMOND 37



MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

☐ ADD ☐ DELETE ☐ REVISED 1

Page 3 of 2

FACILITY ID# 3 0 0 3 5 38 | BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION D 9 4

CONFIDENTIAL LOCATION EPCRA ☒ Yes ☐ No 5 | MAP # 6 | GRID # D 9 7

II. CHEMICAL INFORMATION

CHEMICAL NAME Chloroform | WASTE ☐ Yes 8 | TRADE SECRET ☐ Yes ☐ No 11 * If EPCRA see instructions

COMMON NAME Chloroform 9 | An EHS Chemical ☒ Yes ☑ No 12 *If EHS is "Yes", all amounts must be LBS

CAS # 67-66-3 10 | FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14 | RADIOACTIVE ☐ Yes ☑ No 15 | CURIES 16

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☐ b. LIQUID ☐ c. GAS 17 | FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 18

AVERAGE DAILY AMOUNT ~~10~~ 19 | MAXIMUM DAILY AMOUNT ~~10~~ 20 | ANNUAL WASTE AMOUNT 21 | STATE WASTE CODE 22

UNITS ☒ a. GALLONS ☐ b. CUBIC FEET 23 ☒ c. POUNDS ☐ d. TONS *If EHS, amount must be in pounds. | DAYS ON SITE 365 24 | LARGEST CONTAINER 1 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d STEEL DRUM ☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY ☐ i. VAT ☐ l. FIBER DRUM ☐ l. BAG(S) ☐ l. BOX(S) ☒ m CYLINDER ☒ n. GLASS CONTAINER ☐ o PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP ☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER_____

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	29	30	☐ Yes ☐ No 31	32
2	29	30	☐ Yes ☐ No 31	32
3	29	30	☐ Yes ☐ No 31	32
4	29	30	☐ Yes ☐ No 31	32
5	29	30	☐ Yes ☐ No 31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

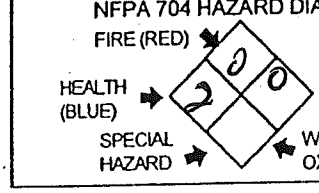
UNDOT # 1888 Refer to shipping papers or MSDS 33

DOT HAZARD CLASS Poison Refer to shipping papers or MSDS 34

EPCRA ☒ YES ☐ NO 35

X Mike Ch If EPCRA, Please Sign Here 36

NFPA 704 HAZARD DIAMOND 37



MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

MSDS Number: **C0957** * * * * * *Effective Date:* ***05/26/09*** * * * * * *Supercedes:* ***07/27/06***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

CARBON DISULFIDE

1. Product Identification

Synonyms: Carbon bisulfide
CAS No.: 75-15-0
Molecular Weight: 76.1
Chemical Formula: CS2
Product Codes:
J.T. Baker: 9172, E350
Mallinckrodt: 8831

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Carbon Disulfide	75-15-0	90 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS. A

DEVELOPMENTAL AND REPRODUCTIVE HAZARD. AFFECTS CARDIOVASCULAR SYSTEM, LIVER AND KIDNEYS.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 3 - Severe (Flammable)
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:
Vapors cause irritation to the respiratory tract, followed by symptoms of headache, dizziness, fatigue, garlic breath, nausea, vomiting, and abdominal pains. Affects the central nervous system and peripheral nervous system. Overexposure may produce hallucinations, narcosis, unconsciousness, convulsions, and even death.

Ingestion:
TOXIC! Symptoms parallel those of inhalation. May cause permanent disabilities described below in Chronic Exposure.

Skin Contact:
May produce reddening and burning, cracking and peeling. Contact with liquid for several minutes may result in a second-degree burn. Skin absorption can occur even in the presence of vapors, with toxic effects paralleling inhalation.

Eye Contact:
Vapors cause eye irritation. Splashes cause severe irritation, possible corneal burns and eye damage.

Chronic Exposure:
Kidney and liver damage, reproductive disorders, central and peripheral nervous system damage, vision problems, psychosis, and cardiovascular effects are associated with chronic exposure to Carbon Disulfide.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance. Affects the developing fetus.

4. First Aid Measures

FOLLOWING ANY ROUTE OF EXPOSURE GET MEDICAL ATTENTION IMMEDIATELY.

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Since effects may be delayed, keep victim under observation. The iodide-azide test is useful in detecting degree of exposure and hyposusceptiblility of exposed workers. I.V. urea 0.5 to 1.5 g/kg is recommended to inactivate free carbon disulfide in the blood. Vitamin B6 in large doses is recommended. Obtain CBC, EKG, urinalysis, and electrolyte balance.

5. Fire Fighting Measures

Fire:
Flash point: -30C (-22F) CC
Autoignition temperature: 90C (194F)
Flammable limits in air % by volume:
lel: 1.3; uel: 50
Extremely Flammable Liquid and Vapor. Contact with strong oxidizers may cause fire. May ignite on contact with hot surfaces such as light bulbs, steam pipes, or engine exhaust pipes.
Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated. Sensitive to static discharge.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Fluoroprotein and protein foams are recommended over other types for carbon disulfide. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of heat and ignition. Flush area with water spray to cool containers and prevent reignition.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Prepare safe grounding routes for lightning strikes in storage area. Electrical installations and heating facilities must be prohibited in or near storage areas. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
OSHA Z-2 TWA, 8 hour 20 ppm;
30 ppm Ceiling; 100 ppm Peak Concentration; Maximum Duration 30 minutes

ACGIH Threshold Limit Value (TLV):
1 ppm (TWA) (skin)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Nearly odorless when pure, but most material has a strong garlic-type odor.
Solubility:
0.2 gm/100 ml water.
Density:
1.26
pH:

No information found.
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
46C (115F)
Melting Point:
-100C (-148F)
Vapor Density (Air=1):
2.6
Vapor Pressure (mm Hg):
300 @ 20C (68F)
Evaporation Rate (BuAc=1):
22.6

10. Stability and Reactivity

Stability:
Stable at room temperature in sealed containers. Heat and sunlight can contribute to instability. Containers may burst when heated.
Hazardous Decomposition Products:
Burning may produce carbon monoxide, carbon dioxide, sulfur oxides.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Contact with strong oxidizers and chemically active metals (such as Potassium, Zinc), chlorine, nitrogen oxides, azides, and organic amines may cause fire and explosions.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:
Inhalation rat LC50: 25 gm/m3/2H. Investigated as a mutagen, reproductive effector.
Reproductive Toxicity:
Carbon disulfide is a known human reproductive hazard. Menstrual disorders, spontaneous abortions and premature births are reported in cases of chronic exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Carbon Disulfide (75-15-0)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may biodegrade to a moderate extent. When released into the

soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life of less than 1 day. This material has an experimentally-determined bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CARBON DISULFIDE
Hazard Class: 3, 6.1
UN/NA: UN1131
Packing Group: I
Information reported for product/size: 2.5L

International (Water, I.M.O.)

Proper Shipping Name: CARBON DISULPHIDE
Hazard Class: 3, 6.1
UN/NA: UN1131
Packing Group: I
Information reported for product/size: 2.5L

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Carbon Disulfide (75-15-0)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Carbon Disulfide (75-15-0)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Carbon Disulfide (75-15-0)	100	10000	Yes	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Carbon Disulfide (75-15-0)	100	P022	Yes

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM.

Australian Hazchem Code: 3WE
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **4** Reactivity: **0**
Label Hazard Warning:
DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. MAY BE FATAL IF SWALLOWED OR INHALED. HARMFUL IF ABSORBED THROUGH SKIN. AFFECTS THE CENTRAL AND PERIPHERAL NERVOUS SYSTEMS. A DEVELOPMENTAL AND REPRODUCTIVE HAZARD. AFFECTS CARDIOVASCULAR SYSTEM, LIVER AND KIDNEYS.
Label Precautions:
Keep away from heat, sparks and flame.
Do not breathe vapor.
Keep container closed.
Do not get in eyes, on skin, or on clothing.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.

Disclaimer:
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Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **C2915** * * * * * *Effective Date:* ***07/02/09*** * * * * * *Supercedes:* ***05/04/07***

MSDS **Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

CHLOROFORM

1. Product Identification

Synonyms: Trichloromethane; Methyl trichloride; Methane trichloride
CAS No.: 67-66-3
Molecular Weight: 119.38
Chemical Formula: CHCl3
Product Codes:
J.T. Baker: 9174, 9175, 9180, 9181, 9182, 9183, 9184, 9186, 9187, 9188, 9257
Mallinckrodt: 1473, 2175, 4432, 4434, 4439, 4440, 4441, 4443, 4444, H407, V551

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Chloroform	67-66-3	98 - 100%	Yes
Ethyl Alcohol	64-17-5	0 - 1%	Yes

3. Hazards Identification

Emergency Overview

DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY AFFECT

CENTRAL NERVOUS SYSTEM, CARDIOVASCULAR SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

Potential Health Effects

Inhalation:
Acts as a relatively potent anesthetic. Irritates respiratory tract and causes central nervous system effects, including headache, drowsiness, dizziness. Exposure to higher concentrations may result in unconsciousness and even death. May cause liver injury and blood disorders. Prolonged exposure may lead to death due to irregular heart beat and kidney and liver disorders.

Ingestion:
Causes severe burning in mouth and throat, pain in the chest and vomiting. Large quantities may cause symptoms similar to inhalation.

Skin Contact:
Causes skin irritation resulting in redness and pain. Removes natural oils. May be absorbed through skin.

Eye Contact:
Vapors causes pain and irritation to eyes. Splashes may cause severe irritation and possible eye damage.

Chronic Exposure:
Prolonged or repeated exposure to vapors may cause damage to the nervous system, the heart and the liver and kidneys. Contact with liquid has defatting effect and may cause chronic irritation of skin with cracking and drying, and corresponding dermatitis. Chloroform is a suspected human carcinogen.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids

occasionally. Get medical attention immediately.

Note to Physician:
Because kidney and liver effects may be delayed, keep victim under observation for 24 to 48 hr. Administration of fluids may help to prevent kidney failure. Obtain blood glucose, urinalysis, liver function tests, chest x-ray, and monitor cardiac function and fluid/electrolyte status. Monitor liver and kidney function for 4 to 5 days after exposure. Disulfiram, its metabolites, and a high carbohydrate diet appear to protect somewhat against chloroform toxicity. Do not give adrenalin! Tests may show increased bilirubin, ketosis, lowered blood prothombin, and fibrogen.

5. Fire Fighting Measures

Fire:
Slight fire hazard when exposed to high heat; otherwise, practically not flammable.
Explosion:
Sealed containers may rupture when heated.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed light-resistant container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Chloroform odor threshold: 250 mg/m3. The odor threshold only serves as a warning of exposure; not smelling it does not mean you are not being exposed.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Chloroform:
-OSHA Permissible Exposure Limit (PEL):
50 ppm (TWA) Ceiling
-ACGIH Threshold Limit Value (TLV):
10 ppm (TWA), Listed as A3 animal carcinogen

For Ethyl Alcohol:
- OSHA Permissible Exposure Limit (PEL):
1,000 ppm (TWA)
- ACGIH Threshold Limit Value (TLV):
1,000 ppm (STEL), A3 - Confirmed animal carcinogen with unknown relevance to humans.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). This substance has poor warning properties.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.

Odor:
Characteristic ethereal odor.

Solubility:
0.8g/100g water @ 20C (68F).

Specific Gravity:
1.48 @ 20C/4C

pH:
No information found.

% Volatiles by volume @ 21C (70F):
100

Boiling Point:
62C (144F)

Melting Point:

-63.5C (-83F)
Vapor Density (Air=1):
4.1
Vapor Pressure (mm Hg):
160 @ 20C (68F)
Evaporation Rate (BuAc=1):
11.6

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. pH decreases on prolonged exposure to light and air due to formation of HCl.
Hazardous Decomposition Products:
May produce carbon monoxide, carbon dioxide, hydrogen chloride and phosgene when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong caustics and chemically active metals such as aluminum, magnesium powder, sodium, or potassium; acetone, fluorine, methanol, sodium methoxide, dinitrogen tetroxide, tert-butoxide, triisopropylphosphine.
Conditions to Avoid:
Light, heat, air and incompatibles.

11. Toxicological Information

Toxicological Data:
Chloroform: oral rat LD50: 908 mg/kg; skin rabbit LD50: > 20 gm/kg; inhalation rat LC50: 47702 mg/m3/4H; irritation data: skin rabbit 10 mg/24H open mild; eye rabbit: 20 mg/24H moderate; investigated as a tumorigen, mutagen, reproductive effector.
Reproductive Toxicity:
Birth defects have been seen in rats and mice exposed by inhalation of chloroform at concentrations greater than 100 ppm in air. Ingestion of chloroform by pregnant laboratory animals has resulted in fetotoxicity but not birth defects, and only at levels causing severe maternal effects.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Chloroform (67-66-3)	No	Yes	2B
Ethyl Alcohol (64-17-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to leach into groundwater. When released into the

soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material is expected to have a half-life of greater than 30 days.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, CHLOROFORM
Hazard Class: 6.1
UN/NA: UN1888
Packing Group: III
Information reported for product/size: 52L

International (Water, I.M.O.)

Proper Shipping Name: CHLOROFORM
Hazard Class: 6.1
UN/NA: UN1888
Packing Group: III
Information reported for product/size: 52L

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Chloroform (67-66-3)	Yes	Yes	Yes	Yes
Ethyl Alcohol (64-17-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	Canada-- DSL	Canada-- NDSL	Phil.

Chloroform (67-66-3)	Yes	Yes	No	Yes
Ethyl Alcohol (64-17-5)	Yes	Yes	No	Yes

\Federal, State & International Regulations - Part 1\

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Chloroform (67-66-3)	10	10000	Yes	No
Ethyl Alcohol (64-17-5)	No	No	No	No

\Federal, State & International Regulations - Part 2\

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Chloroform (67-66-3)	10	U044	No
Ethyl Alcohol (64-17-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2Z
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **2** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY AFFECT CENTRAL NERVOUS SYSTEM, CARDIOVASCULAR SYSTEM, LIVER AND KIDNEYS. SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure.
Label Precautions:
Do not breathe vapor.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.

Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
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Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

☐ ADD ☐ DELETE ☐ REVISED 1

Page 4 2 of ____ 2

FACILITY ID# 3 0 0 3 5 38 BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION 6D 4

CONFIDENTIAL LOCATION EPCRA ☒ Yes ☐ No 5 MAP # 6 GRID # 6D 7

II. CHEMICAL INFORMATION

CHEMICAL NAME Formaldehyde WASTE ☐ Yes 8 TRADE SECRET ☐ Yes ☐ No 11 * If EPCRA see instructions

COMMON NAME Formaldehyde 9 An EHS Chemical ☒ Yes ☐ No 12 *If EHS is "Yes", all amounts must be LBS

CAS # 50-00-0 10 FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14 RADIOACTIVE ☐ Yes ☒ No 15 CURIES 16

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 17 FED. HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE 18 ☒ d. ACUTE HEALTH ☒ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 2 19 MAXIMUM DAILY AMOUNT 2 20 ANNUAL WASTE AMOUNT 21 STATE WASTE CODE 22

UNITS ☐ a. GALLONS ☐ b. CUBIC FEET 23 ☒ c. POUNDS ☐ d. TONS *If EHS, amount must be in pounds. DAYS ON SITE 365 24 LARGEST CONTAINER 1 PINT 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d. STEEL DRUM ☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY ☐ i. VAT ☐ l. FIBER DRUM ☐ l. BAG(S) ☐ l. BOX(S) ☐ m CYLINDER ☐ n. GLASS CONTAINER ☒ o. PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP ☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER____

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	29	30	☐ Yes ☐ No 31	32
2	29	30	☐ Yes ☐ No 31	32
3	29	30	☐ Yes ☐ No 31	32
4	29	30	☐ Yes ☐ No 31	32
5	29	30	☐ Yes ☐ No 31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

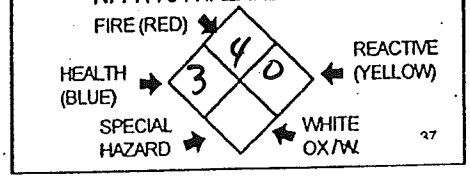
UNDOT # 3077 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS Misc Dangerous Goods 34
Refer to shipping papers or MSDS

EPCRA ☒ YES ☐ NO 35

X _____ 36
If EPCRA, Please Sign Here

NFPA 704 HAZARD DIAMOND



37

MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

MSDS Number: **F5522** * * * * * *Effective Date:* ***09/08/09*** * * * * * *Supercedes:* ***05/04/07***

MSDS **Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

FORMALDEHYDE

1. Product Identification

Synonyms: Formaldehyde 37%; Formalin; Morbicid Acid; Methylene Oxide; Methyl aldehyde
CAS No.: 50-00-0
Molecular Weight: 30.03
Chemical Formula: HCHO and CH3OH in water
Product Codes:
J.T. Baker: 2105, 2106, 2108, 2109
Mallinckrodt: 5014, 5016

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Formaldehyde	50-00-0	37%	Yes
Methyl Alcohol	67-56-1	10 - 15%	Yes
Water	7732-18-5	48 - 53%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer

depends on level and duration of exposure. VAPOR HARMFUL. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. STRONG SENSITIZER. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. CANNOT BE MADE NONPOISONOUS. FLAMMABLE LIQUID AND VAPOR.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 2 - Moderate
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

Potential Health Effects

The perception of formaldehyde by odor and eye irritation becomes less sensitive with time as one adapts to formaldehyde. This can lead to overexposure if a worker is relying on formaldehyde's warning properties to alert him or her to the potential for exposure.

Inhalation:
May cause sore throat, coughing, and shortness of breath. Causes irritation and sensitization of the respiratory tract. Concentrations of 25 to 30 ppm cause severe respiratory tract injury leading to pulmonary edema and pneumonitis. May be fatal in high concentrations.
Ingestion:
Can cause severe abdominal pain, violent vomiting, headache, and diarrhea. Larger doses may produce decreased body temperature, pain in the digestive tract, shallow respiration, weak irregular pulse, unconsciousness and death. Methanol component affects the optic nerve and may cause blindness.
Skin Contact:
Toxic. May cause irritation to skin with redness, pain, and possibly burns. Skin absorption may occur with symptoms paralleling those from ingestion. Formaldehyde is a severe skin irritant and sensitizer. Contact causes white discoloration, smarting, cracking and scaling.
Eye Contact:
Vapors cause irritation to the eyes with redness, pain, and blurred vision. Higher concentrations or splashes may cause irreversible eye damage.
Chronic Exposure:
Frequent or prolonged exposure to formaldehyde may cause hypersensitivity leading to contact dermatitis. Repeated or prolonged skin contact with formaldehyde may cause an allergic reaction in some people. Vision impairment and enlargement of liver may occur from methanol component. Formaldehyde is a suspected carcinogen (positive animal inhalation studies).
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance. Previously exposed persons may have an allergic reaction to future exposures.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a

physician.

Ingestion:
If swallowed and the victim is conscious, dilute, inactivate, or absorb the ingested formaldehyde by giving milk, activated charcoal, or water. Any organic material will inactivate formaldehyde. Keep affected person warm and at rest. Get medical attention immediately. If vomiting occurs, keep head lower than hips.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Monitor arterial blood gases and methanol levels after significant ingestion. Hemodyalysis may be effective in formaldehyde removal. Use formic acid in urine and formaldehyde in blood or expired air as diagnostic tests.

5. Fire Fighting Measures

Fire:
Flash point: 60C (140F) CC
Autoignition temperature: 300C (572F)
Flammable limits in air % by volume:
lel: 7.0; uel: 73
Flammable liquid and vapor! Gas vaporizes readily from solution and is flammable in air.

Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Containers may explode when involved in a fire.

Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures.

practice controls, medical surveillance, record keeping, and reporting requirements. (29 CFR 1910.1048)

9. Physical and Chemical Properties

Appearance:
Clear, colorless liquid.
Odor:
Pungent odor.
Solubility:
Infinitely soluble.
Specific Gravity:
1.08
pH:
2.8 (31% solution)
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
96C (205F)
Melting Point:
-15C (5F)
Vapor Density (Air=1):
1.04
Vapor Pressure (mm Hg):
1.3 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
May form carbon dioxide, carbon monoxide, and formaldehyde when heated to decomposition.
Hazardous Polymerization:
Trioxymethylene precipitate can be formed on long standing at very low temperatures. Nonhazardous polymerization may occur at low temperatures, forming paraformaldehyde, a white solid.
Incompatibilities:
Incompatible with oxidizing agents and alkalis. Reacts explosively with nitrogen dioxide at ca. 180C (356F). Reacts violently with perchloric acid, perchloric acid-aniline mixtures, and nitromethane. Reaction with hydrochloric acid may form bis-chloromethyl ether, an OSHA regulated carcinogen.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Formaldehyde: Oral rat LD50: 100 mg/kg; skin rabbit LD50: 270 uL/kg, Irritation data: eye, rabbit, 750ug Severe; inhalation rat LC50: 203 mg/m3; investigated as a tumorigen, mutagen, reproductive effector; Cancer Status: an OSHA regulated carcinogen. Methanol: oral rat LD50: 5628 mg/kg; inhalation rat LC50: 64000 ppm/4H; skin rabbit LD50: 15800 mg/kg; investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Formaldehyde (50-00-0)	No	Yes	2A
Methyl Alcohol (67-56-1)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
The following statements refer to the environmental fate of formaldehyde. When released into the soil, this material is expected to leach into groundwater. When released into water, this material is expected to readily biodegrade. When released into water, this material is not expected to evaporate significantly. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to be readily degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by dry and wet deposition. When released into the air, this material is expected to have a half-life of less than 1 day. The following statements refer to the environmental fate of methanol. When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition. When released into air, this material is expected to have a half-life between 10 and 30 days.
Environmental Toxicity:
The following toxicity information is for the formaldehyde portion.
96 Hr LC50 fathead minnow: 24.1 mg/L (flow-through);
96 Hr LC50 bluegill: 0.10 mg/L (flow-through);
96 Hr EC50 water flea: 20 mg/L.
The methanol portion is expected to be slightly toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

7. Handling and Storage

Store in a tightly closed container. Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Protect from freezing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
0.75 ppm (TWA), 2 ppm (STEL), 0.5 ppm (TWA) action level for formaldehyde
200 ppm (TWA) for methanol
-ACGIH Threshold Limit Value (TLV):
0.3 ppm Ceiling formaldehyde, Sensitizer, A2 Suspected Human Carcinogen
200 ppm (TWA) 250 ppm (STEL) skin for methanol

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with a formaldehyde cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Irritation also provides warning. For Methanol: If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Breathing air quality must meet the requirements of the OSHA respiratory protection standard (29CFR1910.134). Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Other Control Measures:
See OSHA Standard for more information on personal protective equipment, engineering and work

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: RQ, FORMALDEHYDE, SOLUTION, FLAMMABLE
Hazard Class: 3, 8
UN/NA: UN1198
Packing Group: III
Information reported for product/size: 200L

International (Water, I.M.O.)

Proper Shipping Name: FORMALDEHYDE SOLUTIONS
Hazard Class: 3, 8
UN/NA: UN1198
Packing Group: III
Information reported for product/size: 200L

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Formaldehyde (50-00-0)	Yes	Yes	Yes	Yes
Methyl Alcohol (67-56-1)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Formaldehyde (50-00-0)	Yes	Yes	No	Yes
Methyl Alcohol (67-56-1)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Formaldehyde (50-00-0)	100	500	Yes	No
Methyl Alcohol (67-56-1)	No	No	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Formaldehyde (50-00-0)	100	U122	No
Methyl Alcohol (67-56-1)	5000	U154	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: 2SE
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **2** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! SUSPECT CANCER HAZARD. MAY CAUSE CANCER. Risk of cancer depends on level and duration of exposure. VAPOR HARMFUL. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. STRONG SENSITIZER. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED. CANNOT BE MADE NONPOISONOUS. FLAMMABLE LIQUID AND VAPOR.
Label Precautions:
Keep away from heat, sparks and flame.
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Physical and health hazard information is available from employer and from material safety data sheets.
Label First Aid:
In all cases get medical attention immediately. If swallowed and the victim is conscious, dilute, inactivate, or absorb the ingested formaldehyde by giving milk, activated charcoal, or water. Any organic material will inactivate formaldehyde. Keep affected person warm and at rest. If vomiting occurs, keep head lower than hips. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Product Use:
Laboratory Reagent.
Revision Information:
No Changes.
Disclaimer:
****

****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

Page 5 of 8 2

☐ ADD ☐ DELETE ☐ REVISED 1

FACILITY ID# 30 0 0 3 5 38 BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION 6H 4

CONFIDENTIAL LOCATION EPCRA ☐ Yes ☐ No 5 MAP # 6 GRID # 6H 7

II. CHEMICAL INFORMATION

CHEMICAL NAME NITRIC ACID

WASTE ☐ Yes 8

TRADE SECRET ☐ Yes ☒ No 11

* If EPCRA see instructions

COMMON NAME NITRIC ACID 9

An EHS Chemical ☒ Yes ☐ No 12

*If EHS is "Yes", all amounts must be LBS

CAS # 7697-37-2 10

FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14

RADIOACTIVE ☐ Yes ☒ No 15

CURIES 16

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 17

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 18

AVERAGE DAILY AMOUNT 40 19

MAXIMUM DAILY AMOUNT 80 20

ANNUAL WASTE AMOUNT 21

STATE WASTE CODE 22

UNITS ☐ a. GALLONS ☐ b. CUBIC FEET 23 ☒ c. POUNDS ☐ d. TONS
If EHS, amount must be in pounds.

DAYS ON SITE 365 24

LARGEST CONTAINER 10 lbs 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d STEEL DRUM ☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY ☐ i. VAT ☐ l. FIBER DRUM ☐ l. BAG(S) ☐ l. BOX(S) ☐ m CYLINDER ☒ n. GLASS CONTAINER ☐ o PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP ☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER_____

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	29	30	☐ Yes ☐ No 31	32
2	29	30	☐ Yes ☐ No 31	32
3	29	30	☐ Yes ☐ No 31	32
4	29	30	☐ Yes ☐ No 31	32
5	29	30	☐ Yes ☐ No 31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

UNDOT # 2032 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS Corrosive Oxidizer Poison 34
Refer to shipping papers or MSDS

EPCRA ☒ YES ☐ NO 35

X _____ 36
If EPCRA, Please Sign Here

NFPA 704 HAZARD DIAMOND

FIRE (RED) 0
HEALTH (BLUE) 4
REACTIVE (YELLOW) 1
SPECIAL HAZARD OX
WHITE OX/W 37

MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

MSDS Number: **N3660** * * * * * *Effective Date:* ***11/18/09*** * * * * * *Supercedes:* ***11/07/08***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

NITRIC ACID, 50-70%

1. Product Identification

Synonyms: Aqua Fortis; Azotic Acid; Nitric Acid 50%; Nitric Acid 65%; nitric acid 69-70%
CAS No.: 7697-37-2
Molecular Weight: 63.01
Chemical Formula: HNO3
Product Codes:
J.T. Baker: 5371, 5796, 5801, 5826, 5856, 5876, 5896, 9597, 9598, 9600, 9601, 9602, 9603, 9604, 9606, 9607, 9608, 9610, 9616, 9617, 9670, 9761
Mallinckrodt: 1409, 2704, 2705, 2706, 2707, 2716, 6623, H862, H988, H993, H998, V077, V650

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Nitric Acid	7697-37-2	50 - 70%	Yes
Water	7732-18-5	30 - 50%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY

CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

Inhalation:
Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.
Ingestion:
Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.
Skin Contact:
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.
Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get

medical attention immediately.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

Explosion:

Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive mixtures with air.

Fire Extinguishing Media:

Water spray may be used to keep fire exposed containers cool. Do not get water inside container.

Special Information:

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA), 4 ppm (STEL)
-ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Nitric acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal. Canister-type respirators using sorbents are ineffective.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Colorless to yellowish liquid.
Odor:
Suffocating, acrid.
Solubility:
Infinitely soluble.
Specific Gravity:
1.41
pH:
1.0 (0.1M solution)
% Volatiles by volume @ 21C (70F):
100 (as water and acid)
Boiling Point:
122C (252F)
Melting Point:
-42C (-44F)
Vapor Density (Air=1):
2-3
Vapor Pressure (mm Hg):
48 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Containers may burst when heated.
Hazardous Decomposition Products:
When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
Conditions to Avoid:
Light and heat.

11. Toxicological Information

Nitric acid: Inhalation rat LC50: 244 ppm (NO2)/30M; Investigated as a mutagen, reproductive effector. Oral (human) LDLo: 430 mg/kg.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: NITRIC ACID
Hazard Class: 8, 5.1
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 6.5GL

International (Water, I.M.O.)

Proper Shipping Name: NITRIC ACID
Hazard Class: 8, 5.1
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 6.5GL

International (Air, I.C.A.O.)

Proper Shipping Name: NITRIC ACID
Hazard Class: 8, 5.1
UN/NA: UN2031
Packing Group: II

Information reported for product/size:

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------

Ingredient	TSCA	EC	Japan	Australia
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\---------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\---------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)

Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2PE
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
Label Hazard Warning:
POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 14.
Disclaimer:
****

FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.
****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

6

Page 1 of _____ 2

☐ ADD ☐ DELETE ☐ REVISED 1

FACILITY ID# 3 0 0 3 5 38 BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION FG 4

CONFIDENTIAL LOCATION EPCRA ☐ Yes ☐ No 5 | MAP # 6 | GRID # FG 7

II. CHEMICAL INFORMATION

CHEMICAL NAME Phenol, Crystals | WASTE ☐ Yes 8 | TRADE SECRET ☐ Yes ☒ No 11 (* If EPCRA see instructions)

COMMON NAME Phenol 9 | An EHS Chemical ☒ Yes ☐ No 12 (*If EHS is "Yes", all amounts must be LBS)

CAS # 108-95-2 10 | FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14 | RADIOACTIVE ☐ Yes ☐ No 15 | CURIES 16

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 17 | FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 18

AVERAGE DAILY AMOUNT 9 19 | MAXIMUM DAILY AMOUNT 9 20 | ANNUAL WASTE AMOUNT 21 | STATE WASTE CODE 22

UNITS ☐ a. GALLONS ☐ b. CUBIC FEET 23 ☒ c. POUNDS ☐ d. TONS (*If EHS, amount must be in pounds.) | DAYS ON SITE 365 24 | LARGEST CONTAINER 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d STEEL DRUM ☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY ☐ i. VAT ☐ j. FIBER DRUM ☐ k. BAG(S) ☐ l. BOX(S) ☒ m CYLINDER ☒ n. GLASS CONTAINER ☐ o PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP ☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER_____

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)		EHS		CAS #
1	29		30	☐ Yes ☐ No	31	32
2	29		30	☐ Yes ☐ No	31	32
3	29		30	☐ Yes ☐ No	31	32
4	29		30	☐ Yes ☐ No	31	32
5	29		30	☐ Yes ☐ No	31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

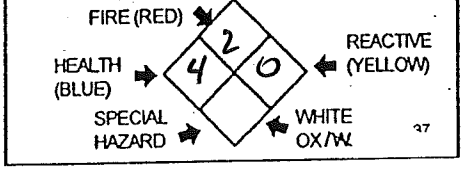
UNDOT # 2312 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS POISON 34
Refer to shipping papers or MSDS

EPCRA ☒ YES ☐ NO 35

x _____ 36
If EPCRA, Please Sign Here

NFPA 704 HAZARD DIAMOND



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MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

MSDS Number: **P1949** * * * * * *Effective Date:* ***05/19/08*** * * * * * *Supercedes:* ***08/24/05***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

PHENOL, CRYSTALS

1. Product Identification

Synonyms: Carbolic acid; Phenic acid; Phenylic acid; Hydroxybenzene; Phenol, fused; Monohydroxybenzene; Phenol, solid
CAS No.: 108-95-2
Molecular Weight: 94.11
Chemical Formula: C6H5OH
Product Codes:
J.T. Baker: 2858, 2862, 4056
Mallinckrodt: 0028, 0052, 0273, 0605, H602

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Phenol	108-95-2	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

POISON! DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. RAPIDLY ABSORBED THROUGH SKIN. CORROSIVE. CAUSES SEVERE

BURNS TO EVERY AREA OF CONTACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. COMBUSTIBLE.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 2 - Moderate
Reactivity Rating: 1 - Slight
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

The major hazard of phenol is its ability to penetrate the skin rapidly, particularly when liquid, causing severe injury which can be fatal. Phenol also has a strong corrosive effect on body tissue causing severe chemical burns. Due to its local anesthetizing properties, skin burns may be painless.

Inhalation:
Breathing vapor, dust or mist results in digestive disturbances (vomiting, difficulty in swallowing, diarrhea, loss of appetite). Will irritate, possibly burn respiratory tract. Other symptoms listed under ingestion may also occur.

Ingestion:
Poison. Symptoms may include burning pain in mouth and throat, abdominal pain, nausea, vomiting, headache, dizziness, muscular weakness, central nervous system effects, increase in heart rate, irregular breathing, coma, and possibly death. Acute exposure is also associated with kidney and liver damage. Ingestion of 1 gram has been lethal to humans.

Skin Contact:
Corrosive. Rapidly absorbed through the skin with systemic poisoning effects to follow. Discoloration and severe burns may occur, but may be disguised by a loss in pain sensation.

Eye Contact:
Corrosive. Eye burns with redness, pain, blurred vision may occur. May cause severe damage and blindness.

Chronic Exposure:
Repeated exposure may cause symptoms described for acute poisoning as well as eye and skin discoloration.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin, eye or central nervous system disorders, or impaired liver, kidney, or pulmonary function may be more susceptible to the effects of this substance.

4. First Aid Measures

IN CASE OF PHENOL POISONING, start first aid treatment immediately, then get medical attention. People administering first aid should take precautions to avoid contact with phenol. A phenol antidote kit (castor oil or other vegetable oil, polyethylene glycol 300) should be available in any phenol work area. Actions to be taken in case of phenol poisoning should be planned and practiced before beginning work with phenol. Castor oil and or polyethylene glycol can be given by a first responder before medical help arrives.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:
If swallowed, immediately administer castor oil or other vegetable oil. Never give anything by mouth to an unconscious person. Be ready to induce vomiting at the advice of physician or poison control center. Castor oil (or vegetable oil) dosage should be between 15 and 30 cc. Get medical attention immediately.

Skin Contact:
In case of skin contact, immediately flush skin with large amounts of water while removing contaminated clothing and shoes. As soon as possible, repeatedly apply polyethylene glycol to affected area. Destroy contaminated clothing and shoes. Flush skin with water for at least 30 minutes. It is very important to avoid rubbing or wiping affected parts which would aggravate irritation and cause product dispersion. Continue treatment until the burned area changes color from white to pink. Expect that this can take a long period of time (20 minutes or more). The polyethylene glycol application should be done during transportation to the hospital. If polyethylene glycol is not available, flush with water for at least 30 minutes prior to going to hospital. Get medical attention immediately.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Treat ingestion with gastric lavage using 40% aqueous Bacto-Peptone, milk or water until phenolic odor is eliminated. Then give 15 to 50 cc castor or vegetable oil. Debride necrotic skin. Monitor vital signs, fluid status, electrolytes, BUN, renal and hepatic function, and electrocardiogram. Manage sedation, seizures, renal failure, and fluid electrolyte imbalances symptomatically as indicated.

5. Fire Fighting Measures

Fire:
Flash point: 79C (174F) CC
Autoignition temperature: 715C (1319F)
Flammable limits in air % by volume:
lel: 1.3; uel: 8.6
Combustible. Contact with strong oxidizers may cause fire.

Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Sealed containers may rupture when heated.

Fire Extinguishing Media:
Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the

air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. Do not flush to the sewer. Dry lime or soda ash may be used on spill for neutralization. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, ventilated area away from sources of heat or ignition. Protect against physical damage. Store separately from reactive or combustible materials, and out of direct sunlight. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating dust and/or static electricity. Empty only into inert or non-flammable atmosphere. Emptying contents into a non-inert atmosphere where flammable vapors may be present could cause a flash fire or explosion due to electrostatic discharge. All phenol workers should be properly trained on its hazards and the proper protective measures required. This training should also include emergency actions. All phenol operations should be enclosed to eliminate any potential exposure routes. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Phenol:
-OSHA Permissible Exposure Limit (PEL):
5 ppm (TWA) (skin)

-ACGIH Threshold Limit Value (TLV):
5 ppm (TWA) (skin)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a full facepiece respirator with organic vapor cartridge and dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Butyl rubber and neoprene are suitable materials for personal protective equipment.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Colorless to light pink crystals.
Odor:
Sharp, medicinal, sweet, tarry.
Solubility:
1 g/15 ml of water; very soluble in alcohol.
Specific Gravity:
1.06 @ 20C/4C
pH:
ca. 6.0 Aqueous solution
% Volatiles by volume @ 21C (70F):
100
Boiling Point:
182C (360F)
Melting Point:
43C (109F)
Vapor Density (Air=1):
3.2
Vapor Pressure (mm Hg):
0.4 @ 20C (68F)
Evaporation Rate (BuAc=1):
< 0.01

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Heat will contribute to instability.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition. Toxic gases and vapors may be released if involved in a fire.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Oxidizers, aluminum chloride and nitrobenzene, calcium hypochlorite, butadiene, halogens, formaldehyde, mineral oxidizing acids, isocyanates, sodium nitrite and many other materials. Hot liquid phenol will attack aluminum, magnesium, lead, and zinc metals.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 317 mg/Kg; skin rabbit LD50:630 mg/kg; inhalation rat LC50: 316 mg/m3; irritation data: skin rabbit, standard Draize, 500 mg/24H severe; eye rabbit, standard Draize 5 mg/30S rinse, mild. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Phenol (108-95-2)	No	No	3

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is not expected to leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into the soil, this material is expected to have a half-life between 1 and 10 days. When released into water, this material is expected to readily biodegrade. When released into water, this material is not expected to evaporate significantly. When released into water, this material is expected to have a half-life between 10 and 30 days. This material has an estimated bioconcentration factor (BCF) of less than 100. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to have a half-life of less than 1 day.
Environmental Toxicity:
This material is expected to be toxic to aquatic life. The LC50/96-hour values for fish are between 10 and 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: PHENOL, SOLID
Hazard Class: 6.1
UN/NA: UN1671
Packing Group: II
Information reported for product/size: 2.5KG

International (Water, I.M.O.)

Proper Shipping Name: PHENOL, SOLID
Hazard Class: 6.1
UN/NA: UN1671

Packing Group: II
Information reported for product/size: 2.5KG

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Phenol (108-95-2)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Phenol (108-95-2)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Phenol (108-95-2)	1000	500*	Yes	No

--------\Federal, State & International Regulations - Part 2\----------------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Phenol (108-95-2)	1000	U188	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: 2X
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **4** Flammability: **2** Reactivity: **0**
Label Hazard Warning:
POISON! DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. RAPIDLY ABSORBED THROUGH SKIN. CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. COMBUSTIBLE.
Label Precautions:
Do not breathe dust.
Do not get in eyes, on skin, or on clothing.
Keep container closed.

Use only with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat, sparks and flame.

Label First Aid:

IN ALL CASES, GET MEDICAL ATTENTION IMMEDIATELY. KEEP A PHENOL ANTIDOTE KIT in area of product use or storage. Administer castor oil and/or polyethylene glycol per pre-planned directions. If swallowed, immediately administer castor oil or other vegetable oil. Never give anything by mouth to an unconscious person. In case of skin contact, immediately flush skin with large amounts of water while removing contaminated clothing and shoes. As soon as possible, repeatedly apply polyethylene glycol to affected area. Destroy contaminated clothing and shoes. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes while lifting lower and upper eyelids.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

HAZARDOUS MATERIALS INVENTORY FORM

FORM 3

☐ ADD ☐ DELETE ☐ REVISED 1

Page 1 of 2

FACILITY ID# 3 0 0 0 3 5 38 | BUSINESS NAME LA TESTING 3

I. FACILITY INFORMATION

CHEMICAL LOCATION A-5 4

CONFIDENTIAL LOCATION EPCRA ☐ Yes ☐ No 5 | MAP # 6 | GRID # H-5 7

II. CHEMICAL INFORMATION

CHEMICAL NAME SULFURIC ACID | WASTE ☐ Yes 8 | TRADE SECRET ☐ Yes ☒ No 11 (* If EPCRA see instructions)

COMMON NAME SULFURIC ACID 9 | An EHS Chemical ☒ Yes ☐ No 12 (*If EHS is "Yes", all amounts must be LBS)

CAS # 7664-93-9 10 | FIRE CODE HAZARD CLASSES (supplied by GGFD) 13

TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 14 | RADIOACTIVE ☐ Yes ☐ No 15 | CURIES 16

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS 17 | FED HAZARD CATEGORIES ☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE 18 ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 20# 19 | MAXIMUM DAILY AMOUNT 40 20 | ANNUAL WASTE AMOUNT 21 | STATE WASTE CODE 22

UNITS ☐ a. GALLONS ☐ b. CUBIC FEET 23 ☒ c. POUNDS ☐ d. TONS (*If EHS, amount must be in pounds.) | DAYS ON SITE 365 24 | LARGEST CONTAINER 25

STORAGE CONTAINER (Check all that apply) 26
☐ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BLDG ☐ d STEEL DRUM ☐ e. PLASTIC DRUM ☐ f. NONMETALLIC DRUM ☐ g. METAL CONTAINER ☐ h. CARBOY ☐ i. VAT ☐ l. FIBER DRUM ☐ l. BAG(S) ☐ l. BOX(S) ☐ m CYLINDER ☒ n. GLASS CONTAINER ☐ o PLASTIC CONTAINER ☐ p. IN MACH OR EQUIP ☐ q. TANK WAGON ☐ r. RAIL CAR ☐ s. TOTE BIN ☐ t. OTHER_____

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 27

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 28

	%WT	HAZARDOUS COMPONENT (For mixture or waste only)	EHS	CAS #
1	29	30	☐ Yes ☐ No 31	32
2	29	30	☐ Yes ☐ No 31	32
3	29	30	☐ Yes ☐ No 31	32
4	29	30	☐ Yes ☐ No 31	32
5	29	30	☐ Yes ☐ No 31	32

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

PLACARDING INFORMATION

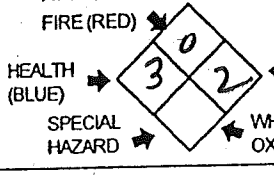
UNDOT # 1830 33
Refer to shipping papers or MSDS

DOT HAZARD CLASS Corrosive 34
Refer to shipping papers or MSDS

EPCRA ☒ YES ☐ NO 35

X _____ 36
If EPCRA, Please Sign Here

NFPA 704 HAZARD DIAMOND



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MAKE AS MANY COPIES OF CHEMICAL INVENTORY FORM AS NEEDED

MSDS Number: **S8234** * * * * * *Effective Date:* ***09/23/09*** * * * * * *Supercedes:* ***11/09/07***

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response In Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SULFURIC ACID, 52 - 100 %

1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid
CAS No.: 7664-93-9
Molecular Weight: 98.08
Chemical Formula: H2SO4 in H2O
Product Codes:
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5858, 5859, 5868, 5889, 5897, 5961, 5971, 5997, 6163, 6902, 9671, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9690, 9691, 9693, 9694, 9697
Mallinckrodt: 21201, 2468, 2876, 2878, 2879, 2900, 2904, 3780, 4222, 5524, 5557, H644, H850, H976, H996, V651, XL003

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.
Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.
Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.
Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.
Chronic Exposure:
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing

contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician immediately.

Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

5. Fire Fighting Measures

Fire:
Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.

Explosion:
Contact with most metals causes formation of flammable and explosive hydrogen gas.

Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
0.2 mg/m3(T) (TWA) for sulfuric acid - A2 Suspected Human Carcinogen for sulfuric acid contained in strong inorganic mists.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear oily liquid.

Odor:
Odorless.

Solubility:
Miscible with water, liberates much heat.

Specific Gravity:
1.84 (98%), 1.40 (50%), 1.07 (10%)

pH:
1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.

% Volatiles by volume @ 21C (70F):
No information found.

Boiling Point:
ca. 290C (ca. 554F) (decomposes at 340C)

Melting Point:

3C (100%), -32C (93%), -38C (78%), -64C (65%).
Vapor Density (Air=1):
3.4
Vapor Pressure (mm Hg):
1 @ 145.8C (295F)
Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.
Hazardous Decomposition Products:
Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
Conditions to Avoid:
Heat, moisture, incompatibles.

11. Toxicological Information

Toxicological Data:
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.
Carcinogenicity:
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the air, this

material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.
Environmental Toxicity:
LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

International (Water, I.M.O.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\---------------------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2P
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **2** Other: **Water reactive**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not contact with water.
Label First Aid:
In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Product Use:
Laboratory Reagent.
Revision Information:

No Changes.

Disclaimer:

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