



EMULATION TECHNOLOGY, INC.

Material Safety Data Sheet

Section 1. Product and Company Identification			
Common Name	CQ291E	Code	20523
Product type	Paste flux (No Clean)	Validation Date	2000-08-03
		Version Number	1
Synonym	Not available.		
Material Uses	Industrial applications: Electronics industry. Soldering paste medium		
Supplier	Emulation Technology, Inc.	In Case of Emergency INFOTRAC (North America): (800) 535-5053 (International): (352) 323-3500	
Manufacturer	Emulation Technology, Inc. 2344 Walsh Ave., Bldg F, Santa Clara, CA 95051		

Section 2. Hazardous Components			
Name	CAS #	% by Weight	Toxicity Data (LC50/LD50, TLV)
1) Polymerized rosin	65997-05-9	30-60	TWA: 15 (mg/m ³) from OSHA (PEL) [United States] INHALATION Respirable.
2) Diethylene glycol monobutyl ether	112-34-5	15-40	ORAL (LD50): Acute: 2400 mg/kg [Mouse]. 5660 mg/kg [Rat]. 2400 mg/kg [Mouse]. DERMAL (LD50): Acute: 4120 mg/kg [Rabbit].
3) Diethylene glycol dibutyl ether	112-73-2	15-40	ORAL (LD50): Acute: 3900 mg/kg [Rat].
4) Rosin	8050-09-7	5-10	* (see section 11)

Section 3. Hazards Identification	
Physical State and Appearance	Liquid. (Pasty)
Emergency Overview	WARNING! Keep away from heat, sparks and flame. Avoid contact with eyes DO NOT ingest. Do not breathe vapor or mist. Avoid prolonged or repeated contact with skin. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of Entry	Ingestion. Inhalation.
Potential Acute Health Effects	<i>Eyes</i> This product may be hazardous in case of eye contact (irritant). <i>Skin</i> This product may be hazardous in case of skin contact (irritant, sensitizer). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. <i>Inhalation</i> Fumes and/or dusts produced by this product may be hazardous in case of inhalation. <i>Ingestion</i> Fumes and/or dusts produced by this product may be hazardous in case of ingestion.
Potential Chronic Health Effects	Fumes and/or dusts produced by this product may be hazardous in case of ingestion, . This product may be hazardous in case of skin contact (irritant, sensitizer, permeator), of inhalation (lung sensitizer).
Medical Conditions Aggravated by Overexposure:	Repeated exposure to toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Overexposure /Signs/Symptoms	Not available.
See Toxicological Information (section 11)	

Continued on Next Page

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
Hazardous Skin Contact	Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Hazardous Inhalation	Fumes in high concentrations: May be harmful if inhaled. Evacuate the victim to a safe area as soon as possible. If the victim is not breathing, perform mouth-to-mouth resuscitation. SEEK IMMEDIATE MEDICAL ATTENTION.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
Hazardous Ingestion	Not available.
Notes to Physician	Not available.

Section 5. Fire Fighting Measures

Flammability of the Product	Combustible.
Auto-Ignition Temperature	Not available
Flash Points	Not available.
Flammable Limits	Not available
Products of Combustion	These products are carbon oxides (CO, CO ₂). Depending on conditions, some aliphatic aldehydes and carboxylic acids also may be formed.
Fire Hazards in Presence of Various Substances	Slightly flammable in presence of open flames and sparks. Combustible in presence of heat, of oxidizing materials. Non-flammable in presence of shocks, of reducing materials, of combustible materials, of organic materials, of metals, of acids, of alkalis, of moisture.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions	SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.
Protective Clothing (Fire)	Be sure to use an approved/certified respirator or equivalent.
Special Remarks on Fire Hazards	No additional remark.
Special Remarks on Explosion Hazards	No additional remark.

Continued on Next Page

Section 6. Accidental Release Measures

Small Spill and Leak	Absorb with an inert material and put the spilled material in an appropriate waste disposal.
Large Spill and Leak	No specific data for large spill and leak according to our database.

Section 7. Handling and Storage

Handling	Wear suitable protective clothing. Use in a well ventilated area. When using do not eat, drink or smoke. Avoid contact with skin and eyes. After handling, always wash hands thoroughly with soap and water.
Storage	Keep container dry. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Section 8. Exposure Controls, Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
----------------------	--

Personal Protection

Eyes Safety glasses.

Body Lab coat.

Respiratory Wear appropriate respirator when ventilation is inadequate. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

Hands Gloves (disposable, vinyl).

Feet Not applicable.

* **Note:** Suggested protective clothing may not be adequate for a specific process. Consult a specialist before using.

Personal Protection in Case of a Large Spill No additional information

Product Name	Exposure Limits
1) Rosin, polymerized. 2) ROSIN CORE SOLDER THERMAL DECOMPOSITION PRODUCTS	TWA: 15 (mg/m ³) from OSHA (PEL) [United States] INHALATION Respirable. *(see section 11)

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Liquid. (Pasty)	Odor	Typical rosin. (Slight.)
Molecular Weight	Not applicable.	Taste	Not applicable
Chemical formula	Not applicable.	Color	Yellowish. (Light.)
pH (1% Soln/Water)	Not applicable.	Specific Gravity	Weighted average: 1 (Water = 1)
Acid Value (IPC TM-650, 2.3.13)	Not available.		
Boiling/Condensation Point	Weighted average: 362°C (683.6°F)		
Melting/Freezing Point	Weighted average: -19.02°C (-2.2°F)		
Critical Temperature	Not available.		

Continued on Next Page

Vapor Pressure	Not available
Vapor Density	Not available
Volatility	Volatile.
Odor Threshold	Not available.
Evaporation Rate	Lower than 1 [Butyl acetate.]
VOC	Not available
Viscosity	Not available.
LogK _{ow}	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	Is not dispersed in cold water, hot water. See solubility in methanol, diethyl ether.
Solubility	Soluble in diethyl ether. Partially soluble in methanol. Insoluble in cold water, hot water.
Physical Chemical Comments	Not available.

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Flammable under fire conditions.
Incompatibility with Various Substances	Not available.
Hazardous Decomposition Products	Not available.
Hazardous Polymerization	Will not occur.
Corrosivity	Slightly corrosive in presence of copper. Non-corrosive in presence of glass.
Special Remarks on Corrosivity	Organic base medium is used to clean a metal surface (remove and prevent oxidation) to improve bonding with the solder.

Section 11. Toxicological Information

Toxic and Chronic Effects on Humans	Fumes and/or dusts produced by this product may be hazardous in case of ingestion, of inhalation. This product may be hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant). CARCINOGENIC EFFECTS: [Rosin thermal decomposition product (as formaldehyde)] - Classified + (Proven) by NIOSH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not toxic. The product may be toxic to blood, kidneys, the nervous system, liver, upper respiratory tract, eye, lens or cornea, thyroid. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Toxicity to Animals	Acute oral toxicity (LD50): 2400 mg/kg [Mouse]. (Diethylene glycol monobutyl ether). Acute dermal toxicity (LD50): 4120 mg/kg [Rabbit]. (Diethylene glycol monobutyl ether).

Continued on Next Page

Special Remarks on Chronic Effects on Humans	Repeated and prolonged contact with bare skin may cause an allergic reaction (sensitization) in susceptible individuals. Sensitive individuals may develop eczema and/or asthma on inhalation of fumes produced by this material.
Special Remarks on Other Toxic Effects on Humans	Inhalation of smoke and fumes, at high temperatures, may cause an asthmatic reaction in some individuals. Prolonged and repeated contact with bare skin may cause irritation or dermatitis. *If this product is heated to temperatures sufficient to produce smoke or fumes, the TLV-TWA of 0.1 mg/m ³ (as formaldehyde, as per ACGIH), for rosin core pyrolysis products should be observed.
Special Remarks on Toxicity to Animals	No additional remark.


Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Biodegradable/OECD	Not available.
Mobility	Not available. Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.
Special Remarks on the Products of Biodegradation	No additional remark.

Section 13. Disposal Considerations

Waste Information	Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Waste Stream	Not available.
Consult your local or regional authorities.	

Section 14. Transport Information


DOT Classification	Not a DOT controlled material (United States).	
	Not regulated	
Special Provisions for Transport	Not applicable.	
Special Provisions for Transport		
IMO/IMDG Classification	Not controlled under IMDG.	
Marine Pollutant	Not available.	
ADR/RID Classification	Not controlled under ADR (Europe).	
ICAO/IATA Classification	Not controlled under IATA.	

Continued on Next Page

Section 15. Regulatory Information

HCS Classification	Class: Sensitizing substance. Class: Target organ effects. Class: Combustible liquid having a flash point between 37.8°C (100°F) and 93.3°C (200°F).
U.S. Federal Regulations	TSCA 4(a) final test rules: Diethylene glycol monobutyl ether TSCA 8(a) IUR: Diethylene glycol monobutyl ether TSCA inventory: ALL COMPONENTS TSCA 12(b) one time export: Diethylene glycol monobutyl ether SARA 302/304/311/312 extremely hazardous substances: No products were found. SARA 302/304 emergency planning and notification: No products were found. SARA 302/304/311/312 hazardous chemicals: Diethylene glycol monobutyl ether; Diethylene glycol dibutyl ether; Rosin SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Diethylene glycol monobutyl ether: fire, immediate health hazard; Diethylene glycol dibutyl ether: fire, immediate health hazard, delayed health hazard; Rosin: immediate health hazard, delayed health hazard SARA 313 toxic chemical notification and release reporting: Diethylene glycol monobutyl ether: 1%; Diethylene glycol dibutyl ether: 1% Clean water act (CWA) 307: No products were found. Clean water act (CWA) 311: No products were found. Clean air act (CAA) 112 accidental release prevention: No products were found. Clean air act (CAA) 112 regulated flammable substances: No products were found. Clean air act (CAA) 112 regulated toxic substances: No products were found.
State Regulations	Pennsylvania RTK: Diethylene glycol monobutyl ether: (environmental hazard, generic environmental hazard); Diethylene glycol dibutyl ether: (environmental hazard, generic environmental hazard) Minnesota: Rosin New Jersey: Diethylene glycol monobutyl ether; Diethylene glycol dibutyl ether California prop. 65: No products were found.
International Regulations	
EINECS	Not available.
DSCL (EEC)	R38- Irritating to skin. 41- Risk of serious damage to eyes. 42/43- May cause sensitization by inhalation and skin contact.
International Lists	Australia (NICNAS): ALL COMPONENTS Korea (TCCL): Diethylene glycol monobutyl ether; Diethylene glycol dibutyl ether; Polymerized rosin; Rosin Philippines (RA6969): Diethylene glycol monobutyl ether; Diethylene glycol dibutyl ether; Polymerized rosin; Rosin

Section 16. Other Information

Hazardous Material Information System (U.S.A.)	Health *	2	National Fire Protection Association (U.S.A.)	
	Fire Hazard	2		
	Reactivity	0		
	Personal Protection	X		
Label statements	<p>HARMFUL IF INHALED OR SWALLOWED. CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, NERVOUS SYSTEM, LIVER, RESPIRATORY TRACT, CRYSTALLINE LENS OR CORNEA, THYROID. MAY CAUSE EYE IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. COMBUSTIBLE LIQUID AND VAPOR. VAPOR MAY CAUSE FIRE.</p>			

Continued on Next Page

References -ACGIH, Threshold Limit Values, 1994-1995. -Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List". -CFR29, OSHA's Permissible Exposure Limits, revision July, 1993. -CFR29, part 1910.1200, Hazard Communication. -CHEMTOX database -Components' manufacturer's Material Safety Data Sheet. -CRC Handbook of chemistry and physics, 67 th edition, CRC Press inc., Boca Raton, Florida. -CSST (Comission de Santé et Sécurité au Travail), document #RT-12: Classification of Certain Chemical Substances. -IATA, Dangerous Goods Regulations, 37th edition (January 1, 1996) -NFPA, Fire Protection Guide to Chemical Hazards, 11th edition. -NIOSH, Pocket Guide to Chemical Hazards, revision June 1994. Sigma-Alrich handbook of fine chemicals, 1998 -TSCA (Toxic Substance Contral Act), Chemical Substance Inventory List, 1985.

Other Special Considerations -ALL COMPONENTS WITH SUSCEPTIBLE HAZARDS THAT ARE PRESENT IN A CONCENTRATION GREATER THAN 1 % (GREATER THAN 0.1 % FOR CARCINOGENS) HAVE BEEN DISCLOSED IN THIS SAFETY DOCUMENT.

Document Modifications New document

Validated by C. Gosselin on 2000-08-03.

Verified by C. Gosselin.
Printed 2000-08-03.

Information/Contact AIM
25 Kenney Drive, Rhode Island, USA, 02920
(401) 463-5605 (800) CALL AIM

Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.