EM RESIST LTD

SPECIALISTS IN RESIST TECHNOLOGY

SAFETY DATA SHEET

Creation Date 21-May-2011 **Revision Date** 10-Feb-2023

SECTION 1: Identification

Product Name:	**MIBK/IPA Series Resist Developers**
Identified Uses:	Developer for Electron Beam Resists
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SECTION 2: Hazards identification

Classification

Flammable liquids	(Category 3)
Acute toxicity, Oral/inhalation	(Category 4)
Skin corrosion/irritation	(Category 2)
Serious eye damage/eye irritation	(Category 2)
Specific target organ toxicity	(Category 3)(respiratory system)
Carcinogenicity	(Category 2)

Label Elements

Pictogram

Signal Word Danger

Hazard statement(s) :

H225	Highly Flammable liquid and vapour
H319	Causes serious eye irritation
H332	Harmful if inhaled

Precautionary statement(s):

P210	Keep away from heat/sparks/open flames/hot surfaces – No smoking
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P280	Wear protective gloves/protective clothing

H335	May cause respiratory irritation
H351	Suspected of causing cancer if inhaled

P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P271	Use only outdoors or in a well-ventilated area.
P233	Keep container tightly closed
P240	Ground/bond container and receiving equipment
P241	Use explosion proof electrical, lighting, ventilation equipment
P242	Use only non-sparking tools
P243	Take precautionary measures against static discharge
P264	Wash exposed skin thoroughly after handling
P305 + P351 + P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a POISON CENTRE or doctor/physician if you feel unwell
P337 + P313	If eye irritation persists: Get medical advice/attention
P370 + P378	In case of fire: Use CO_2, dry chemical or foam for extinction.
P403	Store in a well-ventilated place. Keep container tightly closed

SECTION 3: Composition / information on ingredients

Component	Weight %
Methyl isobutyl ketone CAS: 108-10-1	20-80%
Isopropyl Alcohol CAS: 67-63-0	20-80%

SECTION 4: First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention if irritation persists.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

Inhalation Move to fresh air. If breathing is difficult give oxygen. Get medical attention if symptoms occur.

Ingestion	Do not induce vomiting. Give lots of water to drink. Obtain medical attention
Most important symptoms/effects	Breathing difficulties. Symptoms of overexposure may be headaches, dizziness, tiredness, nausea and vomiting.

SECTION 5: Fire-fighting measures

Suitable Extinguishing Media	User water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.
Flash Point	12 - 16°C / 53 - 61°F
Autoignition Temperature	456°C / 852°F
Specific Hazards Arising from the Chemical	Flammable. Risk of ignition. Vapours may from explosive mixtures with air. Vapours may travel to source of ignition and flash back. Thermal decomposition can lead to release of irritating gases and vapours. Keep product and empty container away from heat and sources of ignition.
Hazardous Combustion Products	Carbon monoxide (CO), Carbon dioxide (CO_2), Peroxides
Protective Equipment and Precautions for Firefighters	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

SECTION 6: Accidental release measures

Personal Precautions	Use personal protective equipment as required. Remove all sources of ignition. Ensure adequate ventilation. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing
Environmental Precautions	Avoid release to the environment
Methods for Containment and Clean Up	Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion- proof equipment

SECTION 7: Handling and storage

Handling	Wear person protective equipment. Keep away from open flames, hot surfaces and sources of ignition. Ensure adequate ventilation. Use spark-proof tools and explosion-proof

	equipment. Take precautionary measures against static discharge. Avoid contact with skin, eyes and clothing
Storage	Keep containers tightly closed in a dry, cool and well ventilated place. Keep away from heat and sources of ignition. Flammables areas

SECTION 8: Exposure controls/personal protection

Exposure Guidelines:

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	ACGIH STEL
Isopropyl alcohol	TWA: 200 ppm STEL: 400 ppm	(Vacated) TWA: 400 ppm (Vacated) STEL: 500 ppm TWA: 400 ppm	IDLH: 2000 ppm TWA: 400 ppm STEL: 500 ppm	-
Methyl isobutyl ketone	TWA: 20 ppm	TWA: 100 ppm	-	TWA: 75 ppm

Engineering Measures	Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location
Personal Protective Equipment **Eye/face Protection**	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166
Skin and body protection	Wear appropriate protective gloves and clothing to prevent skin exposure.
Respiratory Protection	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice

SECTION 9: Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Alcoholic Ketone
Odor Threshold	No Information available

pH	No Information available
Melting Point/Range	No Information available
Boiling Point/Range	82 - 116°C / 179 - 240°F @ 760 mmHg
Flash Point	12-16°C / 53 - 61°F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12 vol %
Lower	1.2 vol %
Vapor Pressure	No Information available
Vapor Density	No Information available
Relative Density	No information available
Solubility	Insoluble in water
Autoignition Temperature	456°C / 852°F
Decomposition Temperature	No information available
Partition coefficient: n-octanol/water	No information available
Viscosity	No information available

SECTION 10: Stability and reactivity

Reactive Hazard	Vapours may form explosive mixture with air
Stability	Stable under normal conditions
Conditions to avoid	Incompatible products. Excess heat. Keep away from open flames, hot surfaces and sources of ignition
Incompatible Materials	Strong oxidising agents
Hazardous Decomposition Products	Carbon monoxide (CO), Carbon dioxide (CO2), peroxides
Hazardous Polymerisation	Hazardous polymerisation does not occur
Hazardous Reactions	May form explosive peroxides

SECTION 11: Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Isopropyl alcohol	5840 mg/kg (Rat)	13900 mg/kg (Rat) 12870 mg/kg (Rabbit)	72.6 mg/L (Rat) 4h
Methyl isobutyl ketone	>2000 mg/kg (Rat)	>2000 mg/kg (Rabbit)	>10 - 20 mg/L (Rat) 4h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as carcinogenic

Component	CAS No.	IARC	NTP	ACGIH	OSHA	Mexico
Methylisobutyl ketone	108-10-1	Group 2B	Not listed	A3	x	A3

Mutagenic Effects No information available

Reproductive Effects No information available

Developmental Effects No information available

Teratogenicity No information available

STOT – single exposure Central nervous system (CNS)

STOT – repeated exposure Liver, Kidney

Aspiration hazard No information available

Symptoms/effects, both acute and delayed Symptoms of overexposure may be headache, dizziness, tiredness, nausea, and vomiting

Endocrine Disruptor Information No information available

SECTION 12: Ecological Information

Ecotoxicity

Component	Freshwater Algae	Freshwater fish	Microtox	Water Flea
Isopropyl alcohol	EC50: > 1000 mg/L, 72h (Desmodesmus subspicatus)	LC50: > 1400000 µg/L, 96h (Lepomis macrochirus)	= 35390 mg/L EC50 Photocacterium phosphoreum 5 min.	13299 mg/L EC50 = 48h 9714 mg/L EC50 = 24h

Methyl isobutyl ketone	EC50: 400 mg/L/96h	LC50: 496 – 514 mg/L, 96h flow through (Pimephales promelas)	EC50 = 79.6 mg/L 5min	EC50: 4280.0 mg/L/24h EC50: 170 mg/L/48h EC50: 4280 mg/L/24h

BOD5 and COD	Not available
Products of Biodegradation	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 more toxic.
Special remarks on the Products of Biodegradation	Not available

SECTION 13: Disposal Considerations

Product	Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated Packaging	Dispose of as unused product.

SECTION 14: Transport Information

UN-No	UN1993
Proper Shipping Name	Flammable Liquid, NOS (Isopropanol, Methyl Isobutyl Ketone mixture)
Hazard Class	3
Packing Group	III

SECTION 15: Regulatory Information

REACH Regulation (EC) No 1907/2006

This product contains only components that have been either pre-registered, registered, are exempt from registration, are regarded as registered or are not subject to registration according to Regulation (EC) No. 1907/2006 (REACH)., Polymers are exempted from registration under REACH. All relevant starting materials and additives have been either pre-registered, registered, or are exempt from registration to Regulation (EC) No. 1907/2006 (REACH)., The aforementioned indications of the REACH registration status are provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. It is the buyer's/user's responsibility to ensure that his/her understanding of the regulatory status of this product is correct.

SECTION 16: Other information

Prepared By	EM Resist Ltd.
Creation Date	21-May-2011
Revision Date	10-February-2023
Revision Summary	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.