MATERIAL SAFETY DATA SHEET

1. Chemical product and company identification

A. Product name MEG-165 Epoxy

Other means of identification

SDS number F02

B. Recommended use and Limitations on use

Recommended use Manufacture of computer, electronic and optical products, electrical equipment
Scientific research and development
Other: Manufacture of medical and defense equipment

Limitations on use Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
Consumer uses: Private households (= general public = consumers)

C. Supplier information

Company name Materion Advanced Materials

Address 6070 Parkland Boulevard
Mayfield Heights OH 44124
United States

Telephone EH&S 1.216.383.4019

Email ehs@materion.com

Contact person Theodore Knudson

Emergency telephone number See Section 16.

MSDS number F02

2. Hazards identification

A. Hazard category/Classification

Physical hazards	Not classified.	
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2
	Sensitization, skin	Category 1
Environmental hazards	Not classified.	

B. Warning label items including precautionary statement

• Pictogram

• Signal word Warning

• Hazard statement

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.

• Precautionary statement

Prevention

P201	Obtain special instructions before use.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.

Response

P302 + P350	If on skin: Wash with plenty of water.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.

P304 + P340	If inhaled: Remove person to fresh air and keep comfortable for breathing.
P362	Take off contaminated clothing and wash before reuse.
P308 + P313	If exposed or concerned: Get medical advice/attention.

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

C. Other hazards not included in the hazard category criteria (e.g. dust explosion hazard) None known.

Supplemental information For further information, please contact the Product Stewardship Department at +1.216.383.4019.

3. Composition/information on ingredients

Chemical identity	Common and alternative names	CAS number	ID number	Content in percent (%)
Polyamide Resin		25191-90-6	KE-09429	40 - 70
Epoxy Resin		25068-38-6	KE-24000	15 - 40
Caprolactam		105-60-2	KE-18554	1 - 5
Dicyandiamide		461-58-5	KE-09066	1 - 5

4. First aid measures

A. In case of eye contact Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

B. In case of skin contact Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. Wash contaminated clothing before reuse.

C. In case of inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a poison center or doctor/physician.

D. In case of swallowing Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

E. Note to physician Provide general supportive measures and treat symptomatically. Keep victim warm.

Most important symptoms/effects, acute and delayed May cause an allergic skin reaction. Skin irritation.

General advice If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

A. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

B. Specific hazards arising from the chemical (example: hazardous combustion products) None known.

C. Specific methods of fire-fighting

Special protective equipment for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Special fire fighting procedures	Move containers from fire area if you can do so without risk.
General fire hazards	No unusual fire or explosion hazards noted.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency measures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid inhalation of dust. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the MSDS.
B. Environmental precautions	Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
C. Methods and materials for containment and cleaning up	Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Prevent entry into waterways, sewer, basements or confined areas. Stop the flow of material, if this is without risk. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the MSDS.

7. Handling and storage

A. Precautions for safe handling	Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.
B. Conditions for safe storage (including any incompatibilities)	Store locked up. Store in tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the MSDS).

8. Exposure controls/personal protection

A. Exposure limit values, biological limit values, etc

Korea. OELs. Standards for Exposure to Chemical Substances and Physically Hazardous Factors

Components	Type	Value	Form
Caprolactam (CAS 105-60-2)	STEL	40 mg/m3	Vapor.
		3 mg/m3	Inhalable dust.
	TWA	20 mg/m3	Vapor.
		1 mg/m3	Inhalable dust.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Caprolactam (CAS 105-60-2)	TWA	5 mg/m3	Inhalable fraction and vapor.

Biological limit values	No biological exposure limits noted for the ingredient(s).
B. Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station and safety shower.

C. Personal protective equipment

• Respiratory protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
• Eye protection	Wear approved safety glasses, goggles, face shield and/or welder’s helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.
• Hand protection	Wear appropriate chemical resistant gloves.

• Body protection	Wear suitable protective clothing.
Hygiene measures	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

A. Appearance	
Physical state	Solid.
Form	Film.
Color	Translucent.
B. Odor	None.
C. Odor threshold	Not applicable.
D. pH	Not applicable.
E. Melting point/freezing point	
Melting point	No data available.
Freezing point	Not applicable.
F. Boiling point, initial boiling point, and boiling range	Not applicable.
G. Flash point	Not applicable.
H. Evaporation rate	Not applicable.
I. Flammability (solid, gas)	None known.
J. Upper/lower limit on flammability or explosive limits	
Flammability limit - lower (%)	Not applicable.
Flammability limit - lower (%) temperature	Not applicable.
Flammability limit - upper (%)	Not applicable.
Flammability limit - upper (%) temperature	Not applicable.
Explosive limit - lower (%)	Not applicable.
Explosive limit - lower (%) temperature	Not applicable.
Explosive limit - upper (%)	Not applicable.
Explosive limit - upper (%) temperature	Not applicable.
K. Vapor pressure	Not applicable.
L. Solubility	
Solubility (water)	Insoluble.
M. Vapor density	Not applicable.
N. Specific gravity	Not applicable.
O. n-octanol/water partition coefficient	Not applicable.
P. Auto-ignition temperature	Not applicable.
Q. Decomposition temperature	Not applicable.
R. Viscosity	Not applicable.
S. Molecular weight	Not available.
Other data	
Density	1.21 g/cm3 estimated
Explosive properties	Not explosive.
Kinematic viscosity	Not applicable.
Oxidizing properties	Not oxidizing.

Particle size	Not applicable.
VOC	Not applicable.

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

A. Stability and hazardous reaction potential

Stability	Material is stable under normal conditions.
Hazardous reaction potential	No dangerous reaction known under conditions of normal use.

B. Conditions to avoid (e.g. static discharge, shock or vibration, etc) Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials.

C. Incompatible materials Strong oxidizing agents.

D. Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

A. Information on likely routes of exposure

• Respiratory organs	Under normal conditions of intended use, this material is not expected to be an inhalation hazard.
• Skin	May cause an allergic skin reaction.
• Eyes	Causes serious eye irritation.
• Mouth	Harmful if swallowed.

B. Information on health hazards

• Acute toxicity (list all possible routes of exposure)	None known.
• Corrosivity or irritation to the skin	Causes skin irritation.
• Serious eye damage/eye irritation	Causes serious eye irritation.
• Respiratory sensitization	Not a respiratory sensitizer.
• Skin sensitization	May cause an allergic skin reaction.
• Carcinogenic properties /Carcinogenicity	

IARC Monographs. Overall Evaluation of Carcinogenicity

Caprolactam (CAS 105-60-2)	3 Not classifiable as to carcinogenicity to humans.

• Mutagenic properties /Mutagenicity	Not classified.
• Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
• Specific target organ toxicity - single exposure	May cause damage to organs.
• Specific target organ toxicity - repeated exposure	May cause damage to organs through prolonged or repeated exposure.
• Aspiration hazard	Not an aspiration hazard.

12. Ecological information

A. Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Product		Species	Test Results
MEG-165 Epoxy			
Aquatic			
Acute			
Crustacea	EC50	Daphnia	16560 mg/l, 48 hours estimated

Components		Species	Test Results
Caprolactam (CAS 105-60-2)			
Aquatic			
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	828 - 2920 mg/l, 48 hours
Fish	LC50	Ide, silver or golden orfe (Leuciscus idus)	1450 mg/l

Hazardous to the aquatic environment, acute hazard An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Hazardous to the aquatic environment, long-term hazard Toxic to aquatic life with long lasting effects.

B. Persistence/degradability No data is available on the degradability of any ingredients in the mixture.

C. Bioaccumulative potential

Octanol/water partition coefficient log Kow

Dicyandiamide	-1.15

D. Mobility in soil No data available for this product.

E. Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

A. Method of disposal Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container (in accordance with related regulations).

B. Disposal considerations (including disposal of contaminated containers or packaging) Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

14. Transport information

IATA

A. UN number Not applicable.

B. UN proper shipping name Not applicable.

C. Transport hazard class(es)

Class Not applicable.

Subsidiary risk -

D. Packing group Not applicable.

E. Environmental hazards No.

F. Special precautions for user Not applicable.

IMDG

A. UN number Not applicable.

B. UN proper shipping name Not applicable.

C. Transport hazard class(es)

Class Not applicable.

Subsidiary risk -

D. Packing group Not applicable.

E. Environmental hazards

Marine pollutant No.

EmS Not applicable.

F. Special precautions for user Not applicable.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.
General information	IMDG Regulated Marine Pollutant.

15. Regulatory information

A. Restrictions under the Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacturing

Not regulated.

Harmful Substances Requiring Permission for Manufacture or Use

Not regulated.

Controlled Hazardous Substances

Not regulated.

Harmful Substances Requiring Special Medical Examination

Not regulated.

Workplace Environmental Monitoring Harmful Materials

Not regulated.

Occupational Exposure Limit

Caprolactam (CAS 105-60-2)

B. Restrictions under the Chemicals Control Law (Previously Toxic Chemicals Control Law)

Accidental Release Prevention Substances

Not regulated.

Act on the Registration and Evaluation of Chemicals

Banned Toxic Chemicals

Not regulated.

Designated Existing Chemicals Subject to Registration (PEC) (MoE No. 2015-92)

Epoxy Resin (CAS 25068-38-6)

Restricted Chemical Substances

Not regulated.

Toxic Chemicals

Not regulated.

C. Restrictions under the Dangerous Substance Safety Management Act

D. Restrictions under the Wastes Control Act

Halogenated Materials in Waste Organic Solvents

Not regulated.

Hazardous Substances

Not regulated.

E. Restrictions under other foreign or domestic laws

Clean Air Conservation Act

Air Pollutants

Not regulated.

Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides (Rules on PIC, MoE No. 2014-252, Dec. 31, 2014; Standards for Pesticides, RDA No. 2014-26), as amended

Not listed.

Specific Air Pollutants

Not regulated.

Further information	This material safety data sheet was prepared in accordance with Article 41 of the Industrial Safety and Health Law.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

A. Source of information

ACGIH
EPA: AQUIRE database
KECI, January 27, 2015, amended through MoE 2016-138, July 13, 2016
Korea. Banned Chemicals (AREC "K-REACH" Article 27; Designation of Restricted or Banned Chemicals, Appendices 4 and 5)
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)
Korea. Existing Chemicals Inventory (KECI, January 27, 2015)
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)
Korea. OELs (ISHL Article 42; MOL Public Notice No. 1986-45, as amended through MOEL Notice 2013-38, August 14, 2013)
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)
Korea. Prohibited Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 4 and 5)
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)
Korea. Restricted Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 2 and 3)
Korea. Restricted Chemicals (AREC "K-REACH" Article 27; Designation of Restricted or Banned Chemicals, Appendices 2 and 3)
Korea. Toxic Chemicals (AREC "K-REACH" Article 20; Designation of Toxic Chemicals, Appendix)
Korea. Toxic Chemicals (AREC "K-REACH" Article 20; Designation of Toxic, Restricted or Banned Chemicals Appendix 1)
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List
Korea. Toxic Release Inventory (TRI) Chemicals (MOE Public Notice No. 2002-166, Nov. 8, 2002)
NLM: Hazardous Substances Data Base
US. IARC Monographs on Occupational Exposures to Chemical Agents

B. Issue date

05-28-2021

C. Number of revisions and date of most recent revision

Not applicable.

Further information

Transportation Emergency
Call Chemtrec at:
International: 703.741.5970
Spain: 900.868.538
Switzerland: 0800.564.402

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