

SAFETY DATA SHEET

Version: 3.0
Date of Issue: 04 May 2017
Date of First Issue: 11 October 2012

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ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label	Denex #3	
Other means of identification	Not applicable	
Recommended use of the chemical and restrictions on use		
Recommended use	PC14 Metal surface treatment products, including galvanic and electroplating products.	
Restrictions on use	Anything other than the above.	
Details of the supplier of the safety data sheet		
Supplier	VISHAY MEASUREMENTS GROUP, INC.	
Address of Supplier	Post Office Box 27777 Raleigh, NC 27611 USA	
Telephone	+1 919-365-3800	
Fax	+1 919-365-3945	
E-Mail (competent person)	mm.us@vishaypg.com	
Emergency telephone number	1-800-424-9300	CHEMTREC (24 hours)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards
Health hazards

Flammable Liquid, Category 2
Skin Corrosion/Irritation, Category 2
Skin Sensitisation, Category 1
Eye Irritation, Category 2
Specific target organ toxicity — single exposure, Category 2
Specific target organ toxicity — single exposure, Category 3
Specific target organ toxicity — repeated exposure, Category 2
Hazardous to the aquatic environment, Chronic, Category 3

Environmental hazards

Hazard Symbol



Signal Word(s)

DANGER

Hazard Statement(s)

Highly flammable liquid and vapour.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause damage to organs. (Blood circulatory system)
May cause drowsiness or dizziness.
May cause damage to organs through prolonged or repeated exposure. (Blood circulatory system, Liver, Spleen)
Harmful to aquatic life with long lasting effects.

Precautionary Statement(s)

Do not breathe vapour.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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Keep container tightly closed.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
If skin irritation occurs: Get medical advice/attention.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF exposed or concerned: Call a POISON CENTER/doctor.

Other hazards None known

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0%

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Acetone	70 - 80	67-64-1	200-662-2	Flammable Liquid, Category 2 Eye Irritation, Category 2 Specific target organ toxicity — single exposure, Category 3
Polymer of Epichlorohydrin (Phenol-Formaldehyde Novolac)	15 - 20	28064-14-4	608-164-0	Skin Corrosion/Irritation, Category 2 Skin Sensitisation, Category 1 Eye Irritation, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
4,4'Sulfonyldianiline	< 5	80-08-0	201-248-4	Acute toxicity, Category 4 – Oral Specific target organ toxicity — single exposure, Category 2 Specific target organ toxicity — repeated exposure, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
Methyl ethyl ketone	< 5	78-93-3	201-159-0	Flammable Liquid, Category 2 Eye Irritation, Category 2 Specific target organ toxicity — single exposure, Category 3
Boron Trifluoride Complex	< 1	75-23-0	200-852-5	Skin Corrosion/Irritation, Category 1A

SECTION 4: FIRST AID MEASURES



Description of first aid measures

Self-protection of the first aider

Inhalation

Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Do not breathe vapour. Avoid all contact. Contaminated clothing should be laundered before reuse.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Apply artificial respiration if patient is not breathing. If breathing is laboured, oxygen should be administered by qualified personnel. Obtain medical attention.

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Skin Contact	IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. Contaminated clothing should be thoroughly cleaned. If skin irritation occurs: Get medical advice/attention.
Eye Contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if eye irritation develops or persists.
Ingestion	IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Drink two glasses of water. Do not give milk or alcoholic beverages. Do not give anything by mouth to an unconscious person. If aspiration is suspected obtain immediate medical attention.
Most important symptoms and effects, both acute and delayed	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause damage to organs. (Blood circulatory system). May cause drowsiness or dizziness. May cause damage to organs through prolonged or repeated exposure. (Blood circulatory system, Liver, Spleen). Inhalation of solvent vapours may give rise to nausea, headaches and dizziness. Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically.
Notes to a physician:	Latency of several hours is possible. If vomiting occurs spontaneously, keep head below hips to prevent aspiration into the lungs. Check the acid/alkali balance. After swallowing do not give any milk or digestible oils. Give a slurry of activated charcoal in water to drink.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	As appropriate for surrounding fire. Extinguish preferably with dry chemical or alcohol foam. Carbon dioxide.
Suitable Extinguishing Media	
Unsuitable extinguishing Media	Water is not generally recommended since it can be ineffective; however, it can be used successfully to cool containers exposed to the fire and to disperse fumes. Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	Highly flammable liquid and vapour. May decompose in a fire giving off toxic fumes. Oxides of carbon. Acetone vapours can form flammable mixtures with air. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Can form explosive mixture with air particularly in empty uncleaned receptacles.
Special protective equipment and precautions for fire fighters	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe vapour. Avoid all contact. Use personal protective equipment as required. See Section: 8.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body. Prevent liquid entering sewers, basements and workpits; vapour may create explosive atmosphere.
Methods and material for containment and cleaning up	Use non-sparking equipment when picking up flammable spill. Avoid contact with plastic. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do NOT absorb in saw-dust or other combustible absorbents. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous

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waste.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Take precautionary measures against static discharge. Do not use sparking tools. Ensure adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe vapour. Avoid all contact. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work.

Conditions for safe storage, including any incompatibilities

Ground/bond container and receiving equipment. Store in a well-ventilated place. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight.

Storage temperature
Storage life
Incompatible materials

Ambient.
Stable under normal conditions.
Keep away from: Oxidizing agents (May cause fire), Alkalis, Bases, Acids (Concentrated nitric and sulfuric acid mixtures), Amines, chloroform, chlorine compounds and potassium t-butoxide.
Can react with Rubber, plastic and Copper.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Acetone	67-64-1	250	590	-	-	NIOSH
		1000	2400	-	-	OSHA
		250	-	500	-	ACGIH, A4
Ethyl methyl ketone	78-93-3	200	590	300*	885*	NIOSH
		200	590	-	-	OSHA
		200	-	300	-	ACGIH

Note: OSHA PELs 1910.1000 TABLE Z-1/ NIOSH RELs / ACGIH TLVs

*NIOSH average value of 15 minutes.

A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

The other components listed in Section 3 do not have occupational exposure limits.

Biological Exposure Indices

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Acetone	67-64-1	Acetone in urine	25 mg/l	End of shift	Ns
Ethyl methyl ketone	78-93-3	Ethyl methyl ketone in urine	2 mg/L	End of shift	Ns

Source: 2015 ACGIH Biological Exposure Indices (BEIs)

Ns - Nonspecific

The other components listed in Section 3 do not have biological exposure indices.

Appropriate engineering controls

Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Have

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Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection



available eyewash bottle with clean water.

General hygiene measures for the handling of chemicals are applicable. Do not breathe vapour. Avoid all contact. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be thoroughly cleaned. Do not eat, drink or smoke at the work place.

Wear protective eye glasses for protection against liquid splashes. Wear eye protection with side protection (EN166).

Skin protection



Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Unsuitable gloves materials: Can react with Rubber and plastic.

Body protection: Flame-resistant antistatic protective clothing. Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection



In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear-Yellowish Liquid.
Odor	Acetone
Odor Threshold	Not available.
pH	Not established.
Melting Point/Freezing Point	95°C
Initial boiling point and boiling range	56.6°C
Flash Point	20°C [Closed cup] (Acetone)
Evaporation rate (Butyl acetate = 1)	7.7 (BuAc = 1)
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Flammable Limits (Upper) (%v/v): 12.8 (Acetone) Flammable Limits (Lower) (%v/v): 2.5 (Acetone)
Vapour pressure	400 mmHg @ 39.5°C
Vapour density	2.0 (Air = 1)
Relative density	0.79 (H ₂ O=1)
Solubility(ies)	Completely miscible with water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity

Stable under normal conditions.

Chemical stability

Stable under normal conditions.

Possibility of hazardous reactions

Highly flammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. May form explosive mixture with air particularly in empty uncleaned receptacles.

Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition

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Incompatible materials	sources. No smoking. Keep away from direct sunlight. Do not use sparking tools. Keep away from: Oxidizing agents (May cause fire), Alkalis, Bases, Acids (Concentrated nitric and sulfuric acid mixtures), Amines, chloroform, chlorine compounds and potassium t-butoxide. Can react with Rubber, plastic and Copper.
Hazardous decomposition product(s)	May decompose in a fire giving off toxic fumes. Oxides of carbon.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Acute toxicity - Inhalation	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 20.0 mg/l.
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Skin Corrosion/Irritation, Category 2: Causes skin irritation.
Serious eye damage/irritation	Eye Irritation, Category 2: Causes serious eye irritation.
Respiratory or skin sensitization	Skin Sensitisation, Category 1: May cause an allergic skin reaction.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
STOT - single exposure	Specific target organ toxicity — single exposure, Category 2: May cause damage to organs. Specific target organ toxicity — single exposure, Category 3: May cause drowsiness or dizziness.
STOT - repeated exposure	Specific target organ toxicity — repeated exposure, Category 2: May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Based upon the available data, the classification criteria are not met.
Information on likely routes of exposure	
Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure
Early onset symptoms related to exposure	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause damage to organs. (Blood circulatory system). May cause drowsiness or dizziness. Inhalation of solvent vapours may give rise to nausea, headaches and dizziness. Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting.
Delayed health effects from exposure	Latency of several hours is possible. May cause damage to organs through prolonged or repeated exposure. (Blood circulatory system, Liver, Spleen)
Other information	
NTP Report on Carcinogens	All chemicals are not listed
IARC Monographs	4,4'Sulfonyldianiline: Group 3 - Not classifiable as to its carcinogenicity to humans.
OSHA Designated Carcinogen	All chemicals are not listed

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SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Chronic 3: Harmful to aquatic life with long lasting effects. Estimated Mixture LC50 > 10 to ≤ 100 mg/l (Fish)
Persistence and degradability	No data for the mixture as a whole. Part of the components are poorly biodegradable.
Bioaccumulative potential	The product has low potential for bioaccumulation.
Mobility in soil	The product is predicted to have high mobility in soil (completely miscible with water). May evaporate quickly.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Do not release undiluted and unneutralised to the sewer. Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.
Additional Information	Dispose of contents in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA
UN number	UN 1090	UN 1090	UN 1090
UN proper shipping name	ACETONE (77% MIXTURE)	ACETONE (77% MIXTURE)	ACETONE (77% MIXTURE)
Transport hazard class(es)	3	3	3
Packing group	II	II	II
Environmental hazards	Not classified	Not classified as a Marine Pollutant.	Not classified
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code			
Special precautions for user	See Section: 2		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal Regulations

TSCA (Toxic Substance Control Act)

Acetone: Subject to 25,000 lb reporting threshold
Polymer of Epichlorohydrin (Phenol-Formaldehyde Novolac): Exempt from reporting under CDR
4,4'-Sulfonyldianiline: Subject to 25,000 lb reporting threshold
Methyl ethyl ketone: Subject to 25,000 lb reporting threshold
Boron Trifluoride Complex: Subject to 25,000 lb reporting threshold
All chemicals are not listed

EPCRA/SARA Section 302 Extremely Hazardous Substances

EPCRA Section 313 Toxics Release Inventory (TRI) Program

All chemicals are not listed

NIOSH Occupational Carcinogen List

All chemicals are not listed

OSHA List of highly hazardous chemicals, toxics and reactives

All chemicals are not listed

NTP Report on Carcinogens (RoC) List

All chemicals are not listed

Poison Prevention Packaging Act

All chemicals are not listed

US State Regulations

California State, Proposition 65 List

All chemicals are not listed

California State, Safer Consumer Products Regulations

Acetone: Candidate Chemicals List
Methyl ethyl ketone: Candidate Chemicals List

Maine State, Toxic Chemicals in Children's Products Act

All chemicals are not listed

New Jersey State Worker and Community RTK Act

Acetone: RTKHSL. SHHSL

Pennsylvania State, Worker and Community RTK Act

Methyl ethyl ketone: RTKHSL. SHHSL

Acetone: Hazardous Substance List. Environmental Hazard List

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Rhode Island State, Hazardous Substances RTK Act

Methyl ethyl ketone: Hazardous Substance List. Environmental Hazard List
Acetone: Hazardous Substance List
Methyl ethyl ketone: Hazardous Substance List

Non-Regional
IARC Monographs, List of Classifications

4,4'Sulfonyldianiline: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. New SDS Regulation compliant with HazCom 2012 format, all sections have been updated to include new information. Please review SDS with care.

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References:

Existing Safety Data Sheet (SDS), EU Data: Harmonised Classification(s) for Acetone (CAS# 67-64-1), 4,4'Sulfonyldianiline (CAS# 80-08-0) and Methyl ethyl ketone (CAS# 78-93-3). Existing ECHA registration(s) for Acetone (CAS# 67-64-1) 4,4'Sulfonyldianiline (CAS# 80-08-0) and Methyl ethyl ketone (CAS# 78-93-3), and the Classification and Labelling Inventory for Epoxy Resin Novalac (CAS# 28064-14-4) and Boron Trifluoride Complex (CAS# 75-23-0).

GHS Classification of the substance or mixture	Classification Procedure
Flammable Liquid, Category 2	Flash Point [Closed cup] Test Result/ Boiling Point (°C)
Skin Corrosion/Irritation, Category 2	Threshold Calculation
Skin Sensitisation, Category 1	Threshold Calculation
Eye Irritation, Category 2	Threshold Calculation
Specific target organ toxicity — single exposure, Category 2	Threshold Calculation
Specific target organ toxicity — single exposure, Category 3	Threshold Calculation
Specific target organ toxicity — repeated exposure, Category 2	Threshold Calculation
Hazardous to the aquatic environment, Chronic, Category 3	Summation Calculation

LEGEND

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Indices (ACGIH)
IARC: International Agency for Research on Cancer
Irr: Irritation
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: The Occupational Safety & Health Administration
PBT: Persistent, Bioaccumulative and Toxic
PEL: Permissible exposure limit

REL: Recommended exposure limit
SCL: Specific Concentration Limit
Skin^o: Risk of overexposure via dermal contact
STEL: Short Term Exposure Limit
TLV: Threshold Limit value
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
URT: Upper respiratory tract
vPvB: very Persistent and very Bioaccumulative

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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