ALLEN AVIONICS, INC.

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MATERIAL SAFETY DATA SHEET FOR HT175 EPOXY INK 09/30/2017

Revised 1/16/06 MSDS ID:8055638 WHITE AND 8054693 BLACK **RoHS COMPLIANT INK**

SECTION 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT PART NUMBER: 8055638 PRODUCT PART NUMBER: 8054693
DESCRIPTION: HT175 WHITE DESCRIPTION: HT175 BLACK

MANUFACTURED FOR
ALLEN AVIONICS INC
2727 CLINTON STREET
RIVER GROVE, IL. 60171 708-453-3238

EMERGENCY RESPONSE NUMBERS:
Transportation:
United States: (800) 424-9300
03431 International: (703) 527-3887(collect)

SECTION 2- HAZARDOUS INGREDIENTS

COMPONENT	CAS # W	PCT(WT)W	CAS # B	PCT(WT)B
Carbon black (black only)	----	----	1333-86-4	7-13
Castor oil, hydrogenated	8001-78-3	1-5	8001-78-3	1-5
Formaldehyde	50-00-0	0.1-1	50-00-0	0.1-1
Trade secret	Ts0000-11-6	0.5-1.5	Ts0000-11-6	0.5-1.5
Cyclohexane-1, 2-dicarboxylic anhydride	85-42-7	1-5	85-42-7	1-5
N-butyl alcohol			71-36-3	0.5-1.5
Tributyl phosphate	126-73-8	10-30	126-73-8	20-40

Exposure and physical property information is presented in Section 9.
If the total percentage is less than 100, the balance of this product is not considered to be hazardous as defined in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION 3- HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS RATING SYSTEM (W)		**NFPA RATING SYSTEM (B)**		**HMIS RATING SYSTEM (W)**		**NFPA RATING SYSTEM (B)**	
Health:	3	Health:	3	Health:	3	Health:	3
Flammability:	1	Flammability:	1	Flammability:	1	Flammability:	1
Reactivity:	1	Reactivity:	1	Reactivity:	1	Reactivity:	1
Protection:	B			Protection:	B		

POTENTIAL HEALTH CONSIDERATIONS

LIKELY ROUTES OF ENTRY:
Inhalation; Absorption; Ingestion

TARGET ORGANS: Kidneys; Eyes; Skin; Digestive Tract; Nervous System; Blood; Bladder, Liver; Lungs; Respiratory Tract; Heart.

POTENTIAL IMMEDIATE EFFECTS FROM OVEREXPOSURE

EYE CONTACT: Can cause severe eye irritation, tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.

SKIN CONTACT: Can cause minor skin irritation, defatting or dermatitis. Skin Sensitizer! Avoid exposure. If sensitized, repeated exposures will result in skin irritation, even at very low concentrations .

SKIN ABSORBTION: Toxic if absorbed through the skin causing systemic damage.

SECTION 3- HAZARDS IDENTIFICATION (Cont)

INHALATION: Can cause respiratory irritation, dizziness, weakness, fatigue, nausea, headache and possible unconsciousness. Respiratory Sensitizer! Avoid exposure. If sensitized, repeated exposures will result in respiratory irritation and shortness of breath, even at very low concentrations. These asthma-type symptoms may develop immediately or be delayed up to several hours.

INGESTION: Toxic. If swallowed, may cause abdominal discomfort, nausea, vomiting, diarrhea and systemic poisoning.

POTENTIAL LONG-TERM EFFECTS FROM OVEREXPOSURE:

CANCER INFORMATION :Contains a substance that is a possible cancer hazard based on human studies. No IARC cancer hazard information available. Clasified by ACGIH as A2 for white. Suspected human carcinogen. Clasified by ACGIH as A4 for black. Not classifiable as a human carcinogen. No NTP cancer hazard information available. No OSHA cancer hazard information available. Classified by IARC as group 2b for : the agent or mixture is a possible carcinogenic for black ink

REPRODUCTIVE SYSTEM INFORMATION: White ink None of the substances in this product have been shown to cause reproductive system disorders. Black ink Contains a substance that is a possible reproductive hazard based on tests with laboratory animals.

ADDITIONAL HEALTH HAZARD INFORMATION

Formaldehyde: Exposure to formaldehyde vapor at concentrations >1 ppm may cause significant irritation of the eyes and respiratory tract. Irritation threshold is about 0.3 ppm. Formaldehyde was found to be weakly active in in vitro genotoxicity tests, but inactive in vivo. Lifetime inhalation of formaldehyde vapor at concentrations above 5 ppm for 6 hours/day caused nasal tumors in laboratory animals. Tributyl phosphate: TBP was found not to be neurotoxic either acutely at 1000 mg/kg or after three months of exposure at up to 325 mg/kg/day. Assuming similar absorption~of TBP by oral and inhalation routes of exposure and a breathing rate of approximately 170 mL/min, these values are approximately equivalent to inhalation exposures of 4900 mg/cu m acutely and 1590 mg/cu m per day subchronically. The ACGIH TLV (TWA) for TBP is 2.2 mg/cu m. This indicates that a minimum of a 700-fold safety factor exists for TBP as a potential neurotoxin(l). Large doses have been reported to cause dyspnea, weakness, pulmonary edema, and twitching in rats. Chronic inhalation of large doses can lead to general poisoning with paralysis, urinary bladder hyperplasia, and increased liver weight.(1) Healy, C.E.; Beyrouty, P.C.; and Broxup, B.R., Am. Ind. Hyg. Assoc J. 56:349-355 (1995).

MEDICAL CONDITIONS ARE POTENTIALLY AGGRAVATED BY OVEREXPOSURE

SECTION -4. FIRST AID MEASURES

EYE CONTACT: Immediately flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Get immediate medical attention.

SKIN CONTACT: Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

INHALATION: Remove to fresh air. If not breathing, perform rescue breathing and, if available, have a trained person administer oxygen. Get medical attention immediately.

INGESTION: Emergency personnel should be contacted immediately and be provided with this MSDS. For ingestion of small quantities of chemicals, the risk associated with inducing vomiting usually exceeds the poisoning risk.

SECTION - 5. FIRE FIGHTING MEASURES

FLAMMABILITY DATA	**WHITE**	**BLACK**
FLASH POINT:	241 F, 116 C	241F, 116C

EXPLOSIVE/FLAMMABILITY LIMITS ESTIMATED FROM INGREDIENTS:

	LOWER LIMIT: 1.4	LOWER LIMIT: 0.8
	UPPER LIMIT: 11.2	UPPER LIMIT: 14.6

AUTOIGNITION TEMPERATURE ESTIMATED FROM INGREDIENTS:

	770 F, 410 C	500 F, 260 C

GENERAL HAZARDS :Vapors may be ignited by heat, sparks, flames or other sources of ignition if heated above the flash point. Vapors are heavier than air and may travel to a source of ignition and flash back. Container may explode in heat of

SECTION - 5. FIRE FIGHTING MEASURES (CONT)

fire. Empty container may still contain residual material that can ignite and/or explode. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty container to heat, flame, sparks, static electricity, or other sources of ignition.

EXTINGUISHING MEDIA: Use alcohol foam, carbon dioxide (C02) or dry chemical. Water may not be effective to extinguish fire. Use water spray to cool fire-exposed containers and to protect personnel.

FIRE FIGHTING INSTRUCTIONS: Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location. Heat may build pressure and rupture closed containers, spreading fire and increasing risk of burns or injuries. Use water spray/fog for cooling. Even if material is water soluble, it may not be practical to extinguish fire by water dilution. Notify authorities if liquid enters sewers or other public waters.

HAZARDOUS COMBUSTION PRODUCTS: carbon dioxide; carbon monoxide; Phosphorus compounds

SECTION - 6. ACCIDENTAL RELEASE MEASURES

SPILL CLEAN-UP PROCEDURES Shut off ignition sources; smoking, flames or other sources of ignition must not be permitted in the area. Small Spills: Take up with sand or other noncombustible absorbent material and put into properly labeled containers for disposal. Large Spills: Dike ahead of liquid spill area to minimize migration and vapor generation. Ventilate the area. Get professional help from outside contractors, the fire department or your trained spill brigade.

HEALTH CONSIDERATIONS AND PROTECTIVE EQUIPMENT Information on the selection and use of personal protective equipment is found in Section 8 of this MSDS. Personal protective equipment needs Must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; material spilled, quantity, the area in which it occurred and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits and consider that the evaporation of volatile solvents can lead to the displacement of air creating an environment that can cause asphxyiation.

SECTION - 7. HANDLING AND STORAGE

HANDLING Avoid contact with material, avoid breathing vapors, use only in a well ventilated area, use bonding and grounding when transferring this material.

STORAGE Store in a cool dry ventilated location, away from sources of ignition or other incompatible, conditions. Keep container(s) closed if possible.

SECTION- 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep exposure to airborne contaminants below the TLV, PEL, or other recommended exposure limit and/or maintain operator comfort.

RESPIRATORY PROTECTION If air monitoring indicates airborne concentrations at or above the limits, or symptoms of inhalation over-exposure occur, a respiratory protection program may be required. Engineering controls to reduce the exposure below acceptable limits are usually preferable to a respirator program.

EYE PROTECTION Chemically resistant safety glasses with side shields must be worn when handling this product. Further eye protection such as chemical splash goggles and/or face shield must be worn when the possibility exists for eye contact due to splashing or spraying liquid or airborne particles. Contact lenses should not be worn. An eye wash station should be available.

SKIN PROTECTION Prevent skin contact by wearing gloves and other protective equipment. Inspect gloves for chemical break-through and replace if detected. Clean protective equipment thoroughly after each use. Do not remove from workplace. An emergency shower in the area is recommended. Appropriate gloves to be used for these products that are mixtures have not been determined. Glove type(s) for ingredients present at 10% or more (if known) are: Butyl rubber, Polyethylene

SECTION- 9. PHYSICAL AND CHEMICAL PROPERTIES PRODUCT

	RTO12 WHITE	RTO12 BLACK
APPEARANCE:	Liquid,semi-paste	Liquid, semi-paste
COLOR:	white	black
ODOR:	Characteristic mild solvent odor	Characteristic mild solvent odor
SPECIFIC GRAVITY	(g/ml): 1.61	(g/ml): 1.20
PERCENT VOLATILE:	22	37
VOC CONTENT(lb/gl):	2.46 lb/gal	Not determined
VAPOR PRESSURE (Pa):	Not determined	Not determined
BOILING PT OR RANGE(F):	ND	ND
pH:	NA	NA
VISCOSITY:	ND	ND
VAPOR DENSITY:	Heavier than air	Heavier than air
FREEZING POINT(F):	ND	ND
EVAPORATION RATE:	0.01-0.1 (n-Butyl acetate= 1)	0.01-0.1 (n-Butyl acetate= 1)

SECTION- 9.1 EXPOSURE, PHYSICAL AND CHEMICAL PROPERTIES FOR COMPONENTS

COMPONENT	ACGIH		OSHA	
	TWA\CEIL	STEL	TWA	CEIL
133-86-4 (black only)	3.5mg/m3	NE	3.5mg/m3	NE
8001-78-3	NE	NE	NE	NE
50-00-0	0.3 ppm c	2 ppm	0.75 ppm	NE
Ts0000-11-6 (black only)	NE	NE	NE	NE
85-42-7	NE	NE	NE	NE
71-36-3 (black only)	50 ppm c sk	NE	100 ppm	NE
126-73-8	0.2 ppm	NE	0.2 ppm	NE

COMPONENT CAS NUMBER	SPECIFIC GRAVITY	EVAP RATE N-BUTYL ACETATE=1	WATER SOLUBILITY Weight %	VAPOR PRESSURE mmHg at F
1333-86-4 (BLACK ONLY)	1.800	ND	Negligible	ND
8001-78-3	1.000	ND	ND	ND
50-00-0	1.000	ND	ND	ND
Ts0000-11-6	1.069	0.5-2	ND	ND
85-42-7	1.190	ND	Negligible;	1.1 mm Hg@ 100c
71-36-3 (black only)	0.808	0.1-0.5	Minimal	1-4.4 mm Hg
126-73-8	0.980	<0.01	Negligible;	7.3 @ 302f

STABILITY Stable under normal conditions.

CONDITIONS TO AVOID Heat, sparks, open flame, other ignition sources, oxidizing conditions, and elevated temperatures.

INCOMPATIBILITY Strong acids; acids; caustics (bases); -strong oxidizing agents;

HAZARDOUS DECOMPOSITION PRODUCTS carbon dioxide; silicon dioxide; carbon monoxide; phosphorus compounds

SECTION- 11. TOXICOLOGICAL INFORMATION

Carbon black: black ink only

Carcinogenicity

NTP: Not classified OSHA: Not classified ACGIH: Not classifiable as a human carcinogen (A4) IARC: Carbon black is possibly carcinogenic to humans (Group 2B) Evaluation: There is inadequate evidence in humans for the carcinogenicity of carbon black. There is sufficient evidence in experimental animals for the carcinogenicity of carbon black. There is sufficient evidence in experimental animals for the carcinogenicity of carbon black extracts. overall evaluation: Carbon black is possibly carcinogenic to humans (Group 2B) [IARC. Monographs on the

SECTION- 11. TOXICOLOGICAL INFORMATION cont

Evaluation of the Carcinogenic Risk of Chemicals to Man. Geneva: World Health Organization, International Agency for Research on Cancer,1972-PRESENT. (Multivolume work).,p. 65 247 (1996)]. Summary of Data Reported and Evaluation: Exposure data: In the late 1980s and early 1990s, more extensive studies in western Europe and the United States have found ... even lower exposures may occur among some workers in industries using carbon black, such as rubber, printing ink and paint manufacture, and exposures to carbon black in the use of rubber, printing ink or paint are negligible. [IARC. Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. Geneva: World Health Organization, International Agency for Research on Cancer,1972-PRESENT. VOL.: 65 (1996) (p. 149)].
LD50 (oral, rat): >8000 mg/kg

LC50 (inhalation, rat): 27000 mg/m3 (27 mg/L) (1-hour exposure).

CHRONIC INHALATION: Hamsters, mice, guinea pigs,, rabbits and monkeys exposed to carbon blacks (channel black or furnace black) at concentrations of 85 mg/m3 (channel black) and 56 mg/m3 (furnace black) intermittently for periods up to 3000 hours (13,000 hours for monkeys) showed no significant effects other than accumulation of dusts in the lungs. The channel black contained extremely low levels of benzene-extractable material and the furnace black contained 0.28% extractable material.

SUBCHRONIC TOXICITY: Rat, inhalation, duration 90 days Target organ: lungs Effect: inflammation, hyperplasia, fibrosis NOEL =1.1 mg/m3

Castor oil, hydrogenated
LD50 (oral, rat): >10,000 mg/kg.
Skin irritation (rabbit): 500 mg/24hr (mild irritant)
Eye irritation (rabbit): 100 mg/24hr (mild irritant)

Formaldehyde:
CARCINOGENICITY: Rats and mice were exposed to 0, 2, 5.6 and 14.3 ppm formaldehyde for 2 years and observed for an additional 6 months. Significant increases in the incidence of squamous cell carcinomas in the nasal cavities were observed in the rats exposed to 14.3 ppm. Two nasal cancers were observed in the mice. Male monkeys, rats and hamsters were exposed to up to 3 ppm for 22 hours per day for 26 wks. Non-cancerous growths were observed in the noses of the monkeys and rats. No effects were demonstrated in the hamsters. IARC evaluation of the carcinogenicity of formaldehyde to experimental animals: sufficient evidence.
SKIN SENSITIZATION: Formaldehyde was a potent skin sensitizer in guinea pigs.
Tributyl phosphate:
Acute toxicity: Oral LD50 Rat: 1390 mg/kg, effectr: kidney, ureter, bladder, (changes in tubules)
Inhalation LC50 rat: 28 gm/m3/1H
Eye rabbit: 500mg, effect severe

SECTION- 12. ECOLOGICAL INFORMATION

N-butyl alcohol: LC50 Pimephales promelas (fathead minnow) 1730 mg/l/96 hr. Release of n-butanol to soil will result in volatilization from the soil surface and biodegradation. n-Butanol should not bind strongly to soil and so is expected to leach into groundwater. Release of n-butanol to water is expected to result in biodegradation and in volatilization from the water surface. Vapor phase n-butanol in the atmosphere is expected to react with photochemically generated hydroxyl radicals with a half-life of 1.2 (experimental)-2.3 (estimated) days.

SECTION- 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with all federal, state, local or provincial regulations.

SECTION-14. TRANSPORT INFORMATION, DOT and IATA:

DOT: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CONTAINS MODIFIED BENZOGUANAMINE RESIN AND FORMALDEHYDE), 9, UN3082, III, LABEL REQUIRED: MARINE POLLUTANT

IATA: NOT RESTRICTED

SECTION-15. REGULATORY INFORMATION

Those ingredients appearing on the following list that do not appear in Section 2 are present at <0.1% for carcinogens, <1% for other hazardous substances, or are not considered hazardous in this product. UNITED STATES OF AMERICA FEDERAL REGULATIONS
CERCLA:

The following components have CERCLA reportable quantities:

CASRN	DESCRIPTION	CERCLA RQ	WEIGHT%
50-00-0	FORMALDEHYDE	100 lb final RQ; 45.4 kg final RQ	0
71-36-3	N-BUTYL ALCOHOL	5000 lb final RQ; 2270 kg final RQ	1

RCRA: The following components are subject to RCRA land disposal restrictions:

CASRN	DESCRIPTION
71-36-3	N-BUTYL ALCOHOL

SARA TITLE III
SECTION 302 Extremely Hazardous Substances (EHS)
CASRN DESCRIPTION
50-00-0 FORMALDEHYDE
SECTION 311/312 Community Right to Know
CASRN DESCRIPTION
50-00-0 FORMALDEHYDE
71-36-3 N-BUTYL ALCOHOL
SARA HAZARD CATEGORY INFORMATION
FIRE: NO
SUDDEN RELEASE OF PRESSURE: NO
REACTIVE: NO
IMMEDIATE (ACUTE) HEALTH HAZARD: YES
DELAYED (CHRONIC) HEALTH HAZARD: YES
SECTION 313 Toxic Chemical Release Inventory Reporting (TRI)
CASRN DESCRIPTION
50-00-0 FORMALDEHYDE 0
71-36-3 N-BUTYL ALCOHOL 1
TSCA

SECTION 8(b) Inventory: All chemicals in this product appear in the inventory or are exempt from the listing requirements.

SECTION 12(b) Export: The following chemicals are subject to export reporting
CASRN DESCRIPTION
71-36-3 N-BUTYL ALCOHOL
126-73-8 TRIBUTYL PHOSPHATE
STATE REGULATIONS
CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65)

The following chemical(s) in this product are known to the State of California to cause cancer:
CASRN DESCRIPTION WGT%
71-43-2 BENZENE 0.001-0
1333-86-4 CARBON BLACK 1-5
50-00-0 FORMALDEHYDE 0.1-1

The benzene content of this material is <80 ppm. The bisphenol A and epichlorohydrin content is <1ppm.

The following ch6mical(s) in this product are known to the State of California to be hazards to reproductive health: WGT%

CASRN DESCRIPTION 0.001-0

SECTION-15. REGULATORY INFORMATION (CONT)

MASSACHUSETTS Right to Know Law

CASRN	DESCRIPTION	WGT%
None RTO12 WHITE		
1333-86-4 (RTO12 BLACK)	CARBON BLACK	7-13%
7631-86-9	AMORPHOUS SILICA 1-5	
8052-41-3	STODDARD SOLVENT 0.5-1.5	

NEW JERSEY Right to Know Law

CASRN	DESCRIPTION	%
1333-86-4 (RTO12 BLACK)	CARBON BLACK	7-13%
112-34-5	DIETHYLENE GLYCOL MONOBUTYL ETHER	0.5-1.5
61789-51-3	COBALT NAPHTHENATE	0.1-1
7631-86-9	SILICA, AMORPHOUS 1-5	
8052-41-3	STODDARD SOLVENT 0.5-1.5	

PENNSYLVANIA Right to Know Law

CASRN	DESCRIPTION	
1333-86-4 (RTO12 BLACK)	CARBON BLACK	7-13%
112-34-5	DIETHYLENE GLYCOL MONOBUTYL ETHER	0.5-1.5
7631-86-9	SILICA, AMORPHOUS	1-5
8052-41-3	STODDARD SOLVENT	0.5-1.5

16. OTHER INFORMATION

Diethylene glycol monobutyl ether: Supplier recommended exposure limit - 35 ppm (TWA)
Note: A CAS number in the form TSXXXX-XX-X is a trade secret. NA= Not applicable ND= Not determined TS= Trade secret

MSDS This information is offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is made. The recommended industrial hygiene and safe handling practices are believed to be generally applicable, however each user must review the recommendations and determine the suitablity for their intended use.

REASON FOR ISSUE: MSDS form revision

APPROVAL DATE: 01/23/2007
SUPERSEDES DATE: 01/16/06

DISCLAIMER OF LIABILITY

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of the material described in this MSDS. Information contained herein is given in good faith and believed to be true and accurate, but all statements or suggestions are made without warranty, expressed implied, regarding the accuracy of the information, the hazards connected with the use of the material, or results to be obtained from the use thereof. All of the ingredients in this product that are considered to present a health hazard as defined in Appendix A of the OSHA "Hazard Communication' standard (29CFR 1910.1200) are listed in Section II. All of the information given, including ingredient identification, CAS Number, and quantity, has been provided in order to meet the objective of the "Hazard Communication" standard.