MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	Durabrite Ink (all Colors), TSO-Econo, TSO-1, TSO-2, TSO-3, TSO-4, TSO-6, TSO-8, TSO-3100
Version #	01
Issue date	07-12-2012
Revision date	-
Supersedes date	-
CAS #	Mixture
Product use	Printing.
Manufacturer/Supplier	FoxJet, an ITW Company 1 Missouri Research Park Drive, St. Charles MO 63304-5685 USA info@foxjet.com Contact Person: Customer Service 800-369-5384
Emergency	Emergency telephone 800-535-5053 (US only) +1-352-323-3500 international

2. Hazards Identification

Physical state	Liquid.
Appearance	Liquid.
Emergency overview	WARNING FLAMMABLE LIQUID AND VAPOR. Causes eye and respiratory tract irritation. May cause mild skin irritation.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Causes eye irritation.
Skin	May cause mild skin irritation.
Inhalation	Causes respiratory tract irritation.
Ingestion	May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.
Chronic effects	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. Contains organic solvents which in case of overexposure may depress the central nervous system causing dizziness and intoxication.
Signs and symptoms	Exposed individuals may experience eye tearing, redness, and discomfort. Vapors may cause drowsiness and dizziness. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
Potential environmental effects	The product contains a substance which may cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Ethanol	64-17-5	25 - 81
Ethyl acetate	141-78-6	0 - 25
2-Propanol	67-63-0	5 - 15
1-Methoxy-2-propanol	107-98-2	0 - 10
Propan-1-ol	71-23-8	0 - 10

Components	CAS #	Percent
Titanium dioxide	13463-67-7	0 - 10
29H,31H-Phthalocyaninato(2-)-N29,N30,N31,N32 copper	147-14-8	0 - 2
C.I. Pigment Yellow 83	5567-15-7	0 - 2
Pigment red	3905-19-9	0 - 2

Composition comments: All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First Aid Measures

First aid procedures

- Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Continue rinsing. Get medical attention immediately.
- Skin contact: Take off contaminated clothing and wash before reuse. Wash off with warm water and soap. Get medical attention if irritation develops and persists.
- Inhalation: Move injured person into fresh air and keep person calm under observation. If necessary, seek hospital and take along these instructions.
- Ingestion: Rinse mouth thoroughly. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

Notes to physician: In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General advice: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.

5. Fire Fighting Measures

Flammable properties: The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back.

Extinguishing media

- Suitable extinguishing media: Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.
- Unsuitable extinguishing media: Do not use water jet as an extinguisher, as this will spread the fire.

Protection of firefighters

- Protective equipment and precautions for firefighters: Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions: Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental Release Measures

Personal precautions: Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions: Avoid discharge into drains, water courses or onto the ground unless authorized by permit.

Methods for containment: Stop leak if you can do so without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up	Extinguish all flames in the vicinity. Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations. For waste disposal, see section 13 of the MSDS.

7. Handling and Storage

Handling	Do not smoke and do not spray near an open flame or other sources of ignition. Vapors are heavier than air and may travel along the floor and in the bottom of containers. Vapors may be ignited by a spark, a hot surface or an ember. The product is flammable, and heating may generate vapors which may form explosive vapor/air mixtures. All equipment used when handling the product must be grounded. Local exhaust is recommended. Observe good industrial hygiene practices. Use Personal Protective Equipment recommended in section 8 of the MSDS.
Storage	Follow rules for flammable liquids. Do not store near heat sources or expose to high temperatures. Keep away from heat, sparks and open flame. Store in a closed container away from incompatible materials. Store between 35°F (2°C) and 120°F (49°C).

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
1-Methoxy-2-propanol (CAS 107-98-2)	STEL	150 ppm
	TWA	100 ppm
2-Propanol (CAS 67-63-0)	STEL	400 ppm
	TWA	200 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Ethyl acetate (CAS 141-78-6)	TWA	400 ppm
Propan-1-ol (CAS 71-23-8)	TWA	100 ppm
Titanium dioxide (CAS 13463-67-7)	TWA	10 mg/m3

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
2-Propanol (CAS 67-63-0)	PEL	980 mg/m3 400 ppm	
Ethanol (CAS 64-17-5)	PEL	1900 mg/m3 1000 ppm	
Ethyl acetate (CAS 141-78-6)	PEL	1400 mg/m3 400 ppm	
Propan-1-ol (CAS 71-23-8)	PEL	500 mg/m3 200 ppm	
Titanium dioxide (CAS 13463-67-7)	PEL	15 mg/m3	Total dust.

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
1-Methoxy-2-propanol (CAS 107-98-2)	STEL	553 mg/m3 150 ppm
	TWA	369 mg/m3 100 ppm
2-Propanol (CAS 67-63-0)	STEL	984 mg/m3 400 ppm
	TWA	492 mg/m3 200 ppm
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3 1000 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Ethyl acetate (CAS 141-78-6)	TWA	1440 mg/m3
		400 ppm
Propan-1-ol (CAS 71-23-8)	STEL	984 mg/m3
		400 ppm
	TWA	492 mg/m3
		200 ppm
Titanium dioxide (CAS 13463-67-7)	TWA	10 mg/m3

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value	Form
1-Methoxy-2-propanol (CAS 107-98-2)	STEL	75 ppm	
	TWA	50 ppm	
2-Propanol (CAS 67-63-0)	STEL	400 ppm	
	TWA	200 ppm	
Ethanol (CAS 64-17-5)	STEL	1000 ppm	
Ethyl acetate (CAS 141-78-6)	TWA	150 ppm	
Propan-1-ol (CAS 71-23-8)	TWA	100 ppm	
Titanium dioxide (CAS 13463-67-7)	TWA	3 mg/m3	Respirable fraction.
		10 mg/m3	Total dust.

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
1-Methoxy-2-propanol (CAS 107-98-2)	STEL	150 ppm
	TWA	100 ppm
2-Propanol (CAS 67-63-0)	STEL	400 ppm
	TWA	200 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Ethyl acetate (CAS 141-78-6)	TWA	400 ppm
Propan-1-ol (CAS 71-23-8)	TWA	100 ppm
Titanium dioxide (CAS 13463-67-7)	TWA	10 mg/m3

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value	Form
1-Methoxy-2-propanol (CAS 107-98-2)	STEL	553 mg/m3	
		150 ppm	
	TWA	369 mg/m3	
		100 ppm	
2-Propanol (CAS 67-63-0)	STEL	1230 mg/m3	
		500 ppm	
	TWA	983 mg/m3	
		400 ppm	
Ethanol (CAS 64-17-5)	TWA	1880 mg/m3	
		1000 ppm	
Ethyl acetate (CAS 141-78-6)	TWA	1440 mg/m3	
		400 ppm	
Propan-1-ol (CAS 71-23-8)	STEL	614 mg/m3	
		250 ppm	
	TWA	492 mg/m3	
		200 ppm	
Titanium dioxide (CAS 13463-67-7)	TWA	10 mg/m3	Total dust.

Mexico. Occupational Exposure Limit Values

Components	Type	Value
2-Propanol (CAS 67-63-0)	STEL	1225 mg/m3

Mexico. Occupational Exposure Limit Values

Components	Type	Value
		500 ppm
	TWA	980 mg/m3
		400 ppm
Ethanol (CAS 64-17-5)	TWA	1900 mg/m3
		1000 ppm
Ethyl acetate (CAS 141-78-6)	TWA	1400 mg/m3
		400 ppm
Propan-1-ol (CAS 71-23-8)	STEL	625 mg/m3
		250 ppm
	TWA	500 mg/m3
		200 ppm
Titanium dioxide (CAS 13463-67-7)	STEL	20 mg/m3
	TWA	10 mg/m3

Engineering controls: Observe Occupational Exposure Limits and minimize the risk of inhalation. Explosion-proof general and local exhaust ventilation. Provide easy access to water supply or an emergency shower.

Personal protective equipment

- Eye / face protection: Wear approved safety goggles.
- Skin protection: Wear appropriate clothing to prevent repeated or prolonged skin contact.
- Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use.
- General hygiene considerations: 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 & Chemical Properties

Appearance	Liquid.
Physical state	Liquid.
Form	Liquid.
Color	Various.
Odor	Characteristic.
Odor threshold	Not available.
pH	Not available.
Vapor pressure	97 hPa at 20°C
Vapor density	Not available.
Boiling point	168.8 °F (76 °C)
Melting point/Freezing point	Not available.
Solubility (water)	Not available.
Specific gravity	Not available.
Flash point	30.2 °F (-1 °C)
Flammability limits in air, upper, % by volume	15 % v/v
Flammability limits in air, lower, % by volume	2.1 % v/v
Auto-ignition temperature	518 °F (270 °C)
Other data	
Flammability (solid, gas)	Not applicable.

10. Chemical Stability & Reactivity Information

Chemical stability	The product is stable and non reactive under normal conditions of use, storage and transport.
Conditions to avoid	Contact with incompatible materials. Keep away from heat, sparks and open flame.
Incompatible materials	Strong oxidizing agents. Strong acids. Strong bases. Alkali metals. Halogens.
Hazardous decomposition products	No hazardous decomposition products are known.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Components	Species	Test Results
1-Methoxy-2-propanol (CAS 107-98-2)		
Acute		
Inhalation		
LC50	Rat	15000 ppm, 4 Hours
Oral		
LD50	Rat	6600 mg/kg
29H,31H-Phthalocyaninato(2-)-N29,N30,N31,N32 copper (CAS 147-14-8)		
Acute		
Oral		
	Rat	15000 mg/kg
2-Propanol (CAS 67-63-0)		
Acute		
Inhalation		
LC50	Rat	16000 ppm, 8 hours
Oral		
LD50	Rat	5045 mg/kg
Ethanol (CAS 64-17-5)		
Acute		
Inhalation		
LC50	Rat	30000 mg/m3
Oral		
LD50	Rat	11.5 g/kg
Ethyl acetate (CAS 141-78-6)		
Acute		
Inhalation		
LC50	Rat	16000 mg/l, 6 Hours
Oral		
LD50	Rat	5600 mg/kg
Propan-1-ol (CAS 71-23-8)		
Acute		
Oral		
LD50	Rat	1.87 g/kg

Sensitization	No data available.
Acute effects	May cause discomfort if swallowed.
Local effects	Causes eye and respiratory tract irritation. May cause mild skin irritation.
Chronic effects	Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis. The product contains organic solvents which may be absorbed into the body by skin contact and cause permanent damage to the nervous system, including the brain.
Carcinogenicity	Titanium dioxide is considered carcinogenic only when in an inhalable powdered form.

ACGIH Carcinogens

2-Propanol (CAS 67-63-0)	A4 Not classifiable as a human carcinogen.
Ethanol (CAS 64-17-5)	A3 Confirmed animal carcinogen with unknown relevance to humans.
Propan-1-ol (CAS 71-23-8)	A4 Not classifiable as a human carcinogen.
Titanium dioxide (CAS 13463-67-7)	A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

Titanium dioxide (CAS 13463-67-7)	2B Possibly carcinogenic to humans.

Mutagenicity	No data available.
Reproductive effects	No data available.
Symptoms and target organs	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Exposed individuals may experience eye tearing, redness, and discomfort. Vapors may cause drowsiness and dizziness.

12. Ecological Information

Ecotoxicological data

Components		Species	Test Results
2-Propanol (CAS 67-63-0)			
Aquatic			
Fish	LC50	Bluegill (Lepomis macrochirus)	> 1400 mg/l, 96 hours
C.I. Pigment Yellow 83 (CAS 5567-15-7)			
Aquatic			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	18 mg/l, 48 hours
Ethanol (CAS 64-17-5)			
Aquatic			
Algae Fish	EC50	Freshwater algae	275 mg/l, 72 Hours
		Marine water algae	1970 mg/l
Invertebrate	LC50	Fathead minnow (Pimephales promelas)	> 100 mg/l, 96 hours
		Freshwater fish	11200 mg/l, 96 Hours
Ethyl acetate (CAS 141-78-6)	EC50	Freshwater invertebrate	5012 mg/l, 48 Hours
Aquatic		Marine water invertebrate	857 mg/l, 48 Hours
Fish			
Propan-1-ol (CAS 71-23-8)			
Aquatic	LC50	Indian catfish (Heteropneustes fossilis)	200.32 - 225.42 mg/l, 96 Hours
Crustacea			
Fish			
	EC50	Water flea (Daphnia magna)	3339 - 3977 mg/l, 48 hours
	LC50	Bleak (Alburnus alburnus)	3000 - 4000 mg/l, 96 hours
Titanium dioxide (CAS 13463-67-7)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	> 1000 mg/l, 48 hours
Fish	LC50	Mummichog (Fundulus heteroclitus)	> 1000 mg/l, 96 hours

Ecotoxicity	The product contains a substance which may cause long-term adverse effects in the environment.
Environmental effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability	No data available.
Bioaccumulation / Accumulation	Not available.

Partition coefficient

Ethanol	-0.31
2-Propanol	0.05
Propan-1-ol	0.25
Ethyl acetate	0.73

Mobility in environmental media	The product is partially soluble in water. It will partially dissolve in water and partially spread on water surfaces while some of the components will eventually sediment in water systems. The volatile components of the product will spread in the atmosphere.

13. Disposal Considerations

Waste codes	D001: Waste Flammable material with a flash point <140 °F
Disposal instructions	Dispose in accordance with all applicable regulations.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1210
Proper shipping name	Printing ink
Hazard class Packing group	3
Environmental hazards	II
Marine pollutant	No
Special precautions	Read safety instructions, MSDS and emergency procedures before handling.

Additional information:

Special provisions	149, IB2, T4, TP1, TP8
Packaging exceptions	150
Packaging non bulk	173
Packaging bulk	242

IATA

UN number	UN1210
UN proper shipping name	Printing ink
Transport hazard class(es)	3
Packing group	II
Environmental hazards	No
Labels required	3
ERG code	3L
Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IMDG

UN number	UN1210
UN proper shipping name	PRINTING INK
Transport hazard class(es)	3
Packing group	II
Environmental hazards	
Marine pollutant	No
Labels required	3
EmS No.	F-E, S-D

TDG

Proper shipping name	PRINTING INK
Hazard class UN number	3
Packing group	UN1210
Marine pollutant	II
Special provisions	No
Labels required	59, 83
	3

15. Regulatory Information

US federal regulations — This product is hazardous according to OSHA 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

2-Propanol (CAS 67-63-0)	1.0 %

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Ethyl acetate: 5000
Propan-1-ol: 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CFR 355, Appendix A)	No
Section 311/312 (40 CFR 370)	Yes
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
Canadian regulations	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
WHMIS status	Controlled
WHMIS classification	B2 - Flammable Liquids D1A - Immediate/Serious-VERY TOXIC D2B - Other Toxic Effects-TOXIC

WHMIS labeling

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

State regulations

US - California Hazardous Substances (Director's): Listed substance

1-Methoxy-2-propanol (CAS 107-98-2)	Listed.
2-Propanol (CAS 67-63-0)	Listed.
Ethanol (CAS 64-17-5)	Listed.
Ethyl acetate (CAS 141-78-6)	Listed.
Propan-1-ol (CAS 71-23-8)	Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Titanium dioxide (CAS 13463-67-7)	Listed.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Titanium dioxide (CAS 13463-67-7)	Listed: September 2, 2011 Carcinogenic.

US - New Jersey RTK - Substances: Listed substance

1-Methoxy-2-propanol (CAS 107-98-2)	Listed.
29H,31H-Phthalocyaninato(2-)-N29,N30,N31,N32 copper (CAS 147-14-8)	Listed.
2-Propanol (CAS 67-63-0)	Listed.
Ethanol (CAS 64-17-5)	Listed.
Propan-1-ol (CAS 71-23-8)	Listed.
Titanium dioxide (CAS 13463-67-7)	Listed.

US. Massachusetts RTK - Substance List

1-Methoxy-2-propanol (CAS 107-98-2)	Listed.
2-Propanol (CAS 67-63-0)	Listed.
Ethanol (CAS 64-17-5)	Listed.
Ethyl acetate (CAS 141-78-6)	Listed.

Propan-1-ol (CAS 71-23-8)	Listed.
Titanium dioxide (CAS 13463-67-7)	Listed.

US. New Jersey Worker and Community Right-to-Know Act

2-Propanol (CAS 67-63-0)	500 LBS

US. Pennsylvania RTK - Hazardous Substances

1-Methoxy-2-propanol (CAS 107-98-2)	Listed.
2-Propanol (CAS 67-63-0)	Listed.
Ethanol (CAS 64-17-5)	Listed.
Ethyl acetate (CAS 141-78-6)	Listed.
Propan-1-ol (CAS 71-23-8)	Listed.
Titanium dioxide (CAS 13463-67-7)	Listed.

Mexico regulations This safety data sheet was prepared in accordance with the Official Mexican Standard (NOM-018-STPS-2000).

16. Other Information

Further information HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings
Health: 2*
Flammability: 3
Physical hazard: 0

NFPA ratings
Health: 2
Flammability: 3
Instability: 0

Disclaimer This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.