UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Friday, March 10, 2006

MEMORANDUM

Subject: Acute Toxicity Review for EPA Reg. No.: 82874-R/ LM 1000 AF
DP Barcode: D322633

To: Marshall Swindell, PM 33/ Martha Terry
Regulatory Management Branch
Antimicrobials Division (7510C)

From: Ian Blackwell, Biologist
Chemistry and Toxicology Team
Product Science Branch
Antimicrobials Division (7510C)

Through: Karen Hicks, Team Leader
Chemistry and Toxicology Team
Product Science Branch
Antimicrobials Division (7510C)

Michele E. Wingfield, Chief
Product Science Branch
Antimicrobials Division (7510C)

3/14/06

Applicant: LuminOre Industrial and Marine Coatings, Inc.

FORMULATION FROM LABEL:

Active Ingredient(s):	% by wt.
Copper	99.75
Other Ingredient(s):	0.25
Total:	100.00%

1) BACKGROUND: LuminOre Industrial and Marine Coatings, Inc., has submitted a complete set of acute toxicity and primary irritation studies to support the registration of their product, "LM 1000 AF". The MRID Number is 466600-03.

While the registration product is named "LM 1000 AF", the test material is identified as "L-5500". Upon request, the registrant faxed a letter stating that L-5500 *is* LM 1000 AF.

The product is sold in three parts. Each of those parts was used in this testing. The product was mixed in accordance with the manufacturer's directions.

2) RECOMMENDATIONS: PSB findings are:

a) The acute oral, acute dermal and acute inhalation toxicity studies are acceptable.

b) The dermal sensitization, and, primary eye and skin irritation studies are acceptable.

The acute toxicity profile for File Symbol 82874-R is currently:

Study	MRID Number	Toxicity Category	Status
Acute Oral Toxicity	466600-03	IV	Acceptable
Acute Dermal Toxicity	466600-04	IV	Acceptable
Acute Inhalation Toxicity	466600-05	IV	Acceptable
Primary Eye Irritation	466600-06	III	Acceptable
Primary Skin Irritation	466600-07	III	Acceptable
Dermal Sensitization	466600-08	Nonsensitizer	Acceptable

3) LABELING:

a) The signal word is "CAUTION".

b) The Precautionary Statements should state:

"Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling."

c) The First Aid statements should state:

IF IN EYES:

- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.
- Call a Poison Control Center or doctor for treatment advice.

IF ON SKIN:

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a Poison Control Center or doctor for treatment advice.

DATA REVIEW FOR ACUTE ORAL TOXICITY TESTING (§ 81-1, 870.1100)

Product Manager: 33 **Reviewer**: I. Blackwell
MRID No.: 466600-03 **Study Completion Date**: 5/2/5
Lab Study No.: 16752

Testing Laboratory: Product Safety Laboratories
Authors: Jennifer Durando, B.S.

Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.

Species: Sprague-Dawley rats
Age: 10 weeks
Weight: 194-207 g
Source: Ace Animals, Inc.

Conclusion:

3. LD_{50} (mg/kg): **Males = Not tested**
Females> 5,000 mg/kg
Combined =

2. The estimated LD_{50} is greater than 5,000 mg/kg b.w.
3. Toxicity Category: IV **Classification**: Acceptable

Procedure (Deviations from §81-1): None

Results:

Dosage (mg/kg)	(Number Deaths/Number Tested)		
	Males	Females	Combined
5,000 mg/kg	Not tested	0/3	n/a

Observations: No abnormalities were noted.

Gross Necropsy: No gross abnormalities were noted.

DATA REVIEW FOR ACUTE DERMAL TOXICITY TESTING (§81-2, 870.1200)

Product Manager: 33 **Reviewer**: I. Blackwell
MRID No.: 466600-04 **Study Completion Date**: 5/2/5
Lab Study No.: 16753
Testing Laboratory: Product Safety Laboratories
Author: Jennifer Durando, B.S.
Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.

Species: Sprague-Dawley rat
Weight: Males= 250-264g **Age**: 8-9 weeks
Females=175-204g
Source: Ace Animals, Inc.

Summary:

1. **LD_{50} (mg/kg)**:

Males > 5,000 mg/kg
Females > 5,000 mg/kg
Combined > 5,000 mg/kg

2. **The estimated LD_{50} is greater than 5,000 mg/kg b.w.**

3. **Toxicity Category**: IV **Classification**: Acceptable

Procedure (Deviation From §81-2): None

Results:

Reported Mortality

DOSAGE (mg/kg)	(NUMBER DEATHS/NUMBER TESTED)		
	Males	Females	Combined
5,000 mg/kg	0/5	0/5	0/10

Observations: Brown stains at dose site, "mechanical damage occurred as a result of patch removal and the site was depilated" in 4 animals.

Gross Necropsy Findings: No gross abnormalities.

DATA REVIEW FOR ACUTE INHALATION TOXICITY (§81-3, 870.1300)

Product Manager: 33 **Reviewer**: I. Blackwell
MRID No.: 466600-05 **Study Completion Date**: 5/2/5
Lab Study No.: 16754

Testing Laboratory: Product Safety Laboratories
Author: Jennifer Durando, B.S.

Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.

Concentration: 2.04 mg/L

Species: Sprague-Dawley rats, albino
Age: 9-10 weeks
Weight: Males = 318 - 352 g; Females = 209 - 232 g
Source: Ace Animals, Inc.

Summary:

1. **LC_{50} (mg/L)**: **Males > 2.04**
   Females > 2.04
   Combined > 2.04

2. **The estimated LC_{50} is greater than 2.04 mg/L of air.**
3. **MMAD**: 3.55 μm
4. **Toxicity Category**: IV **Classification**: Acceptable

Procedure (Deviation From §81-3): None

Results:

Reported Mortality

Exposure Concentration	(NUMBER DEATHS/NUMBER TESTED)		
	Males	Females	Combined
2.04 mg/L	0/5	0/5	0/10

Chamber Atmosphere			
Dose Level	MMAD	GSD	Particles < 4.7 μm
2.04 mg/L	3.55 μm	2.25 μm	67.25%

Chamber Environment	
Chamber Volume	150 liters
Airflow	50.4 – 50.9 LPM
Temperature	21-22° C
Relative Humidity	38-67%

Clinical Observations: "Active and healthy"

Gross Necropsy Findings: No gross abnormalities were noted.

DATA REVIEW FOR PRIMARY EYE IRRITATION TESTING (§81-4, 870.2400)

Product Manager: 33 **Reviewer:** I. Blackwell
MRID No.: 466600-06 **Study Completion Date:** 5/2/5
Lab Study No.: 16755
Testing Laboratory: Product Safety Laboratories
Author(s): Jennifer Durando, B.S.

Species: New Zealand White rabbit
Weight: Not reported **Age:** Young adult
Source: Robinson Service, Inc.

Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.
Dosage: 0.1 mL

Summary:

1. **Toxicity Category:** III

2. **Classification:** Acceptable

Procedure (Deviations From §81-4): None

Results:

Observations	(number "positive"/number tested)							
	Hour	Days						
	1	1	2	3	4	7	14	21
Corneal Opacity	0/3	3/3	3/3	2/3	0/3	0/3	---	---
Iritis	3/3	3/3	3/3	0/3	0/3	0/3	---	---
Conjunctivae								
Redness	3/3	3/3	3/3	1/3	0/3	0/3	---	---
Chemosis	3/3	2/3	1/3	0/3	0/3	0/3	---	---
Discharge	3/3	3/3	2/3	1/3	0/3	0/3	---	---

- - - = no observations at this point

DATA REVIEW FOR SKIN IRRITATION TESTING (§81-5, 870.2500)

Product Manager: 33 **Reviewer**: I. Blackwell
MRID No.: 466600-07 **Study Completion Date**: 5/2/5
Lab Study No.: 16756
Testing Laboratory: Product Safety Laboratories
Author: Jennifer Durando, B.S.

Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.
Dosage: 0.5 mL of prepared mixture

Species: New Zealand White rabbit
Weight: Not reported **Age**: Young adult
Source: Robinson Services, Inc.

Summary:

1. **Toxicity Category**: III

2. **Classification**: Acceptable

Procedure (Deviations From §81-5): None

Results: "For the first 72-hours after patch removal, all three treated sites exhibited well-defined to moderate erythema and very slight edema. Although the overall incidence and severity of irritation decreased thereafter, desquamation was noted for all treated sites between Days 7 and 14 and very slight erythema persisted for all animals through Day 14 (study termination). Some of the irritation observed during this study may be been the result of mechanical injury incurred during patch removal.

Special Comments: None

DATA REVIEW FOR DERMAL SENSITIZATION TESTING (§81-6, 870.2600)

Product Manager: 33 **Reviewer**: I. Blackwell
MRID No.: 466600-08 **Study Completion Date**: 5/2/5
Lab Study No.: 16757
Testing Laboratory: Product Safety Laboratories
Author: Jennifer Durando, B.S.

Quality Assurance (40 CFR §160.12): Included

Test Material: L-5500; 3 part system: QuickCoat copper material, QuickCoat binder, and MEKP.
Positive Control Material: α-hexylcinnamaldehyde

Species: Hartley albino guinea pigs
Weight: 314-402 g **Age**: Young adult
Source: Elm Hill Breeding Labs

Method: Buehler Method

Summary:

1. **This Product is not a dermal sensitizer.**

2. **Classification**: Acceptable

Procedure (Deviation From §81-6): None

Procedure: A 75% w/w mixture of the prepared test substance in polyethylene glycol 400 was topically applied to twenty healthy test guinea pigs. This was applied once weekly for a three-week induction period. Twenty-seven days after induction, a challenge dose of the prepared test substance at its highest non-irritating concentration (HNIC, determined in the preliminary irritation screen to be a 50% w/w mixture of the prepared test substance in polyethylene glycol 400) was applied to a naive site on each guinea pig.

Results:
Induction:
Twenty-four hours after the first induction treatment, 3/20 test material-induced animals displayed faint erythema, usually confluent erythema and 15/20 had very faint, usually nonconfluent erythema. Twenty-four hours after induction treatment #2, 17/20 animals displayed very faint, usually

nonconfluent erythema. Twenty-four hours after induction treatment #3, 11/20 animals displayed very faint, usually nonconfluent erythema.

Very faint to faint erythema was noted for all positive control test sites during the induction phase.

Challenge:

Twenty-four hours after challenge, 11/20 test material-induced animals displayed very faint, usually nonconfluent erythema. At this same point in the study, 5/10 naïve control animals displayed very faint, usually nonconfluent erythema.

Twenty-four hours after challenge, 6/10 positive control animals displayed faint erythema, usually confluent erythema, and, 3/10 displayed very faint erythema, usually non-confluent erythema.